



# PROCEEDINGS

**BECOMING REFLECTIVE EDUCATORS AND PROFESSIONALS OF LEARNING**  
**November 25–28, 2014**

World Association of Lesson Studies  
International Conference 2014 in Bandung, Indonesia

**WALS**



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World Association of Lesson Studies

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## PREFACE

On behalf of the Organizing Committee of World Association of Lesson Studies (WALS) 2014 International Conference, I would like to welcome all participants both local and overseas to the 8<sup>th</sup> annual conference at Indonesia University of Education in Bandung, Indonesia. The Bandung conference has attracted attention of international community around the globe. There are 782 registered participants from 29 countries with the largest contingent from Indonesia followed by Singapore, Japan, and Sweden.

The theme of WALS 2014 International Conference is **Becoming Reflective Educators and Professionals of Learning**. This theme reflects the continuity of efforts to be reflective educators and professional who never stop learning. Such is represented in the form knowledge, expertise, and other resources which are developed, invested, accumulated, and distributed to improve the quality of teaching and learning.

In this conference, educators and teachers from Africa, America, Asia, Australia and Europe continents come together to share their research and practices on improving the quality of teaching and learning, teacher education and development, school improvement, and learning community through Lesson and Learning Studies.

This proceeding is a collection of papers presented in the WALS 2014 International Conference. It covers 13 strands:

1. Teacher Professional Development
2. Action Research
3. Pedagogies and Teaching Strategies
4. Designing for Learning with Quality in Specific Subjects
5. Research on Lessons in Different Cultures
6. Issues about Leading Lesson Study
7. Learning Communities for School Reform
8. Developing Communities of Practices
9. Creating Knowledge in Practice
10. Student Learning and Development
11. Lesson and Learning Study in Pre-School
12. Lesson and Learning Study in Special Education settings
13. Lesson and Learning Study in Higher Education

We are sure that the papers and discussions from WALS 2014 International Conference will make a major contribution to the national and international dialogue on Lesson/Learning Studies. However, we would like to remind that the views expressed in the papers are those of each author alone and do not necessarily represent those of the organizing institutions or any of their affiliates.

I wish all of us a fruitful conference and opportunities to build networking during the conference. I hope you enjoy the conference and your time at UPI.

Sumar Hendayana, Ph.D.  
Chair  
Organizing Committee of WALS  
2014  
International Conference

# Welcome Message

On behalf of the Organizing Committee of World Association of Lesson Studies (WALS) 2014 International Conference, I would like to welcome all participants both local and overseas to the 8<sup>th</sup> annual conference at Indonesia University of Education in Bandung, Indonesia. This Bandung conference has attracted attention of international community around the globe to join WALS 2014 conference in Bandung . We have 782 registered participants from 29 countries with the largest contingent from Indonesia followed by Singapore, Japan, and Sweden. The theme of WALS conference this year is “Becoming Reflective Educators and Professionals of Learning” as we would like to emphasize the how importance it is for teachers and educators to always reflect and learn from their practices in order to improve their professionalism.

This conference program provides you with information about papers, speakers, and venues. Three hundred eighty-six papers will be shared and discussed during the three-day conference. Four papers will be presented by four recognized keynote speakers from United Kingdom, Japan, United States of America, and Indonesia. Ten papers will be shared on two plenary sessions by invited speakers. Participants have many choices to attend concurrent sessions of 372 papers consisting of symposium, workshop, poster, and paper presentations. In addition, the conference offers participants with optional school visits at all levels of education from pre-school to higher-education on November 28, 2014. During the school visit, participants may observe lessons and participate in a post class discussion.

Collaboration and partnership are the spirit of lesson study. WALS 2014 is made possible through the collaboration and partnership with the Directorate General of Higher Education and West Java Provincial Office of Education.

I wish all of us a fruitful conference and opportunities to build networking during four days of the WALS 2014 International Conference. I hope you enjoy the conference and your time at UPI.



Sumar Hendayana, Ph.D.  
Chair  
Organizing Committee of WALS 2014  
International  
Conference

It is with great pleasure that I welcome all of you to the World Association of Lesson Studies (WALS) 2014 annual conference in Bandung, Indonesia. WALS is privileged to work together with Indonesia University of Education in organizing this conference and to receive the support from Ministry of Higher Education, Research and Technology, Republic of Indonesia, West Java Provincial Office of Education, the Government of Bandung City, and Japan International Cooperation Agency (JICA). The Indonesia University of Education has been playing an important role in developing and disseminating Lesson Study across Indonesia as well as to other countries in Asia and Africa through technical cooperation with JICA.

The conference organizing team led by Dr. Sumar Hendayana from Indonesia University of Education has worked extremely hard to ensure the success of our annual conference. As of October 2014, the conference has drawn 819 delegates with the largest contingent from Indonesia (375) followed by Singapore (197), Japan (68), Sweden (48), Phillipines (18), Malaysia (16), Thailand (13), United Kingdom (11), China (8), Hong Kong (8) and Brunei (7). For the first time, African countries such as Ethiopia (7), Zambia (7) and Senegal (2), as well as Bangladesh are represented at a WALS annual conference. This outreach to new countries reflects the influence that Indonesia has in these countries as a result of the partnership they have with JICA and Japanese colleagues working in African countries. A total of 28 countries will be represented at WALS 2014 annual meeting in Bandung.

We look forward to the rich conversations among our delegates during the conference on the theme ***Becoming Reflective Educators and Professionals of Learning***. There are **304 papers, 50 posters, 9 workshops, 9 symposiums, 10 plenary sessions and 4 keynotes**. Our annual conferences bring teachers, academics, researchers and policy makers together to discuss lesson study research and practices and to learn from each other's work. We hope to see the development of professional and academic networks through mutual assistance and information exchange among our members at this meeting.

The success of WALS 2014 Bandung meeting is made possible by the dedication of the local organizing team led by WALS Executive Committee and Council Member, Dr. Sumar Hendayana from Indonesia University of Education. We want to thank them for their hard work over the last 2 years to provide an interesting and stimulating conference programme for all participants. We want to thank the Indonesia University of Education for hosting this conference. We are also thankful for the generous support from Ministry of Research, Technology, and Higher Education, Republic of Indonesia, West Java Provincial Office of Education, the Government of Bandung City and Japan International Cooperation Agency (JICA).

I wish all of you a fruitful and engaging time at WALS 2014.



Associate Professor  
President,  
World Association of Lesson Studies  
National Institute of Education,  
Nanyang Technological University, Singapore

On behalf of the West Java Provincial Office of Education, we welcome all the participants from Indonesia and overseas. One of the missions of the West Java Provincial Office of Education is improving the access and quality of education. One of the strategies in improving the quality of education is by implementing Lesson Study as a form of teacher continuing professional development through partnership with UPI that has been established since 2006 to develop and disseminate best practices on lesson study in West Java. Beginning with the piloting of lesson study in Sumedang District, lesson study then spread to 16 districts/cities in West Java. Thousands of teachers in West Java have enjoyed the benefits of Lesson Study for the improvement of the quality of education as activities in lesson study have updated their knowledge and skills in facilitating students' learning.

Activities in teacher professional development through lesson study are conducted at school so that the training for teachers becomes more contextual in solving problems at class levels, it does not require high expenses, and it does not cause teachers to abandon their students while participating in the training. Teachers become confident and accountable in teaching students and teaching-learning activities tend to shift from teacher-centered to student-centered while teacher sensitivity toward students experiencing learning problems has increased. In addition, teachers who have been accustomed to lesson study can adapt easily in implementing the Curriculum 2013 because teacher collaboration in analyzing lessons is not something new in lesson study. Teachers have been accustomed to analyzing lessons to stimulate students to think and reason, and build their knowledge so that students understand phenomenon and not to memorize facts.

At WALS 2014 Conference, West Java Provincial Office of Education has facilitated 200 teachers to participate in this conference and half of them present their papers to share their experiences in lesson study. Through this conference, we hope that teachers in West Java will gain more knowledge to even more optimize classroom teaching and learning. Last but not least, we hope that you enjoy the cool atmosphere of Bandung and the conference.



Prof. Dr. H. Moh. Wahyudin Zarkasyi, CPA  
Head of West Java Provincial Office of Education

On behalf of the Directorate of Learning and Student Affairs, Ministry of Higher Education, Research and Technology. We wish you the warmest welcome to all participants from various countries. We have facilitated forty-two LPTKs (Educational Institution for Teacher Training) from Aceh to Papua with grants to develop lesson study to improve the quality of learning in higher education since 2009. We collaborate with teaching and learning experts from UPI (Indonesia University of Education), UNY (State University of Yogyakarta), and UM (State University of Malang) to foster LPTKs in the Western, Central, and Eastern regions of Indonesia. The supports in the forms of block grants for three years have been put to good use by LPTKs to focus on the improvement of teaching and learning quality. In addition, LPTKs partner with neighboring schools to develop school-based lesson study in the third year.

Through lesson study, University lecturers collaborate with teachers to plan, implement lesson plans, and reflect the teaching and learning processes. We witness positive changes from the grant recipients such as lecturers have become more accountable and open to criticism in carrying out teaching and learning activities, and have become more confident in teaching students. There is also a paradigm shift in classroom teaching from teacher-centered to learner-centered, and a more harmonious relationship between LPTKs and schools. Results of the development of lesson study in grant-receiving LPTKs will be shared in WALS 2014 Conference. One of the characteristics of WALS 2014 International Conference is the addition of a new strand called Lesson Study in Higher Education Setting.

We hope that participants of WALS 2014 Conference can learn from each other and build international networks in enhancing the quality of education. Please enjoy your stay in Bandung and we hope you enjoy WALS 2014 Conference.



Dr. Ilah Sailah  
Director,  
Directorate of Learning and Student Affairs  
Ministry of Higher Education, Research and Technology

In this very happy occasion, on behalf of the Indonesia University of Education or Universitas Pendidikan Indonesia (UPI), I would like to welcome all the conference participants, both Indonesian and international participants, to our beautiful UPI campus in the city of Bandung. It is quite an honor for the Indonesia University of Education to host the World Association of Lesson Studies International Conference 2014. This conference is made possible through the cooperation between the Indonesia University of Education (UPI), Bandung City Office of Education, West Java Provincial Office of Education, Directorate of Higher Education, World Association of Lesson Studies (WALS), and Japan International Cooperation Agency (JICA). UPI has been the pioneer of the development of *Lesson Study* since 2006 together with JICA through the SISTTEMS Project (Strengthening In-service Teacher Training of Mathematics and Science at Secondary Level) and PELITA (Quality Improvement of SMP/MTs). At the beginning, we assigned 32 FPMIPA lecturers to collaborate with 500 mathematics and science teachers in 94 Junior High Schools to carry out innovation in mathematics and science learning through hands-on, mind-on, daily life by utilizing local materials as teaching materials in Sumedang District, West Java. Training teachers through lesson study puts more emphasizes on empowering teachers collegially than on instructing them to implement models of instruction. In Lesson Study, teachers and university lecturers collaboratively analyze teaching and learning through the cycle of *Plan, Do, See* to improve the quality of teaching and learning. From Sumedang District, we learned valuable lessons from the SISTTEMS Project that, among others, teacher improved their self-confidence and accountability in facilitating student's learning, collaboration between teachers and school leaders improved significantly, teaching and learning shifted from teacher-centered toward student-centered, teachers became more sensitive to and aware of students' learning problems, students were facilitated to learn collaboratively, student achievement gradually improved, and school image in the community improved significantly. Eventhough external supports have already ended, the schools in Sumedang District still continue to implement *Lesson Study* because the community realize the positive impacts of the practice of *Lesson Study*. Learning from the success of the implementation of *Lesson Study* in Sumedang District as a form of teacher professional development, UPI has expanded the target areas for *Lesson Study* in Indonesia. From 2008 to 2010, with the supports from Sampoerna Foundation, UPI trained 1500 teachers of mathematics, science education, Bahasa Indonesia, and English subjects in Karawang District (West Java province), Surabaya City, and Pasuruan District (East Java province). Since 2010, with the supports from the Directorate of Higher Education and the West Java Provincial Office of Education, UPI has trained 7,000 teachers of elementary, junior high, and senior high schools, and headmasters, and supervisors in 10 districts throughout the West Java province. In 2013, through the collaboration with the Government of Jambi Province, UPI trained 5,000 teachers of elementary, junior high, and senior high schools in 10 districts in Jambi province. In addition, UPI has also implemented the practice of *Lesson Study* to improve university courses in pre-service programs. We would like to extend our thanks and appreciation to all parties that have supported the organization of WALS International Conference 2014. Through this conference, let us strengthen our international network to share experiences and learn from each other to improve the quality of education through *Lesson Study*. We wish you all a fruitful and enjoyable WALS International Conference 2014!

Bandung, 24 November 2014



Prof. Dr. Sunaryo Kartadinata, M.Pd.  
Rector,  
Indonesia University of Education  
(Universitas Pendidikan Indonesia)



On behalf of the Government of the Republic of Indonesia, I happily welcome all the participants of the WALS (World Association of Lesson Studies) Conference from various countries. Welcome to Bandung, Indonesia! In this 21st century, we are facing a complex global competition characterized by the rapid development of technology and multicultural society, and therefore education should provide our students with life skills and career skills having characteristics of flexibility and adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability, and leadership and responsibility. To help develop those skills, learning should be carried out in such a way that it can support creativity and innovation, critical thinking and problem solving, communication and collaboration, and information, media and ICT literacy. Therefore, the Government of Indonesia has revised the previous curriculum and developed a new curriculum known by Curriculum 2013 to be implemented comprehensively in 2014. Curriculum 2013 puts emphasis on learning processes because we believe that quality learning processes will result in quality student's achievement too. In learning, students must be facilitated to be able to build knowledge, not to be told. Consequently, the challenge for educators in the primary and secondary levels, and in the university level as well, is to change the paradigm in the classroom from teaching to learning. To implement the new curriculum, we have provided student's book, teacher's book, and we have trained the teachers, principals, and supervisors for one week in all levels of education. The one week training was meant for the socialization of the new curriculum which, afterwards, has to be followed up with continuous lesson studies.



Prof. Dr., Muhammad Nasir, Ph.D  
Minister of Higher Education, Research and  
Technology

Lesson study is a strategy to improve the quality of teaching and learning through studying the teaching and learning processes continuously by empowering teacher's potentials collaboratively and collegially. Lesson study emphasizes student-centered learning and trains high order thinking skills through daily life approach as well as utilizing local materials. Lesson study also functions as a continuous professional development. Lesson study activities are usually carried out at school so that these activities are relevant and are based on real classroom activities. The Government appreciates all the teachers who have implemented lesson study and we hope that the implementation of lesson study will improve the quality of classroom teaching and learning, and it ultimately will improve the quality of education in the country.

Lesson Study has been introduced in Indonesia since 2006 through the technical cooperation under the support from JICA. Although the supports from JICA ended in 2011, the practice of lesson study did not stop. Lesson study continued in various regions supported by regional government and universities. However, lesson study activities still need to be improved so that lesson study can affect the improvement of the quality of education in Indonesia. WALS 2014 conference organized by UPI has to be used well as a forum for learning from each other and for network building among educators from all over the world.

Last but not least, we would like to thank World Association of Lesson Studies (WALS) and UPI for organizing WALS 2014 conference. We hope that all participants of WALS 2014 conference will obtain invaluable lessons to improve the quality of education their own country.

We wish you a fruitful and enjoyable conference!

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## The English Teachers' Perception of Lesson Study

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**Abstract:** Your abstract should be This report is the study of the English Teachers' perception of Lesson Study, which investigated thirty English teachers in Kota Sukabumi. Lesson Study is cycle of professional development in which teachers work together in a team to plan a lesson, apply the lesson in the classroom and evaluate the process of learning through collegiality, and collaborative work. The aims of this study are to investigate the perception of the participants toward Lesson Study program, and to capture the process of Lesson Study implemented in Kota Sukabumi. The study employed a qualitative research design which embraces characteristics of a case study. The data were gathered from several data collection techniques: class observations, questionnaires and interviews to collect some supporting data. The result shows that the English Teachers' perception is positive and they fully understand the term of Lesson Study. However, there are some teachers who doubt about the effect of Lesson Study in developing teachers' professional competence. In the process of Lesson Study, somehow teachers' responsibility and motivation are not fully appeared and take into account that Lesson Study is not their need. They tended to come to the venue only if the headmaster or the district officer asked them to come. From the findings it is recommended that teachers should realize that they need to develop their teaching competence through certain ways which one of them is Lesson Study. Through Lesson Study teachers could learn from each other and recognize the way the students learn in the classroom.

**Keywords:** English teacher, perception, Lesson Study, Teacher professional development

### 1 INTRODUCTION

Among many education components, teachers are so essential that improving teachers' professional proficiency has become one of government's concerns. For many years, the government of Indonesia has attempted to enhance the quality of teachers through numerous programs along with the increasing budget allocation for improving education quality. Teachers are targeted for trainings, workshops, seminars, new method and approach try-outs.

One of the recent endeavors intended for educators in Indonesia is "the Lesson Study". Held by means of the technical cooperation between the Japan International Cooperation Agency (JICA) and three Indonesian leading teacher education institutions, in which UPI is one of them, Lesson Study (LS) is a form of professional development program to improve teachers' competencies and expertise (Suratno, 2012). It has been widely practiced in Japan and has been developed as an approach to improve teacher proficiency (Marsigit, 2007; Sutiadi, 2008; Suratno, 2012). Since its introduction in early 2000s in Indonesia, LS has been viewed as a promising and powerful approach

to teacher professional development and school improvement (Suratno et.al, 2009; Suratno 2012; Copriady 2013). LS is a community-based professional advancement effort where the participants work together as a team to achieve the objective of learning in the classroom which becomes one of the advantages of this program. Studies have indicated that teachers' working together with other teachers is beneficial in increasing teacher effectiveness (Garmston & Wellman, 1999; in Sickle, 2011). It is also in line with the statement of Bandura (2006) that the interactions that happen between people as they work together create synergies that make the work stronger than the collection of the individual talents.

Previous studies conducted by researchers such as; Fernandez (2002); Marsigit (2006); Sutiadi (2008); Suratno et.al (2009); Sickle (2011); Hendayana et.al. (2011); Shahreen and Khalid (2011); and Copriady (2013) show that teachers practicing LS often report a positive impact on their teaching practices and, as a result, students' learning from participation in the LS process. Furthermore, teachers' perception on LS showed positively perceived (Sutiadi, 2008). However, many teachers are still misled in understanding the concept of LS,

as Halilah (2011) found on her research in Kabupaten Bandung Barat, they could not explain comprehensively about LS. Suratno et.al (2009) also indicated that teachers still need assistance in comprehending and implementing LS.

Teachers misled perception about LS, somehow suspected to lead the result in reluctance to attending the program and averting to apply what is obtained from LS sessions in the classroom as well. It is the case in Kota Sukabumi that sometimes the participants of the LS put too much attention to the model teachers, while LS puts the emphasis on the students; participant teachers observe the students during the session not to the model teacher. Therefore, in the reflection session, the model teacher feels discouraged of criticism from the participant and unwilling to precede the program, and unfortunately this disinclination is contagious to other participants.

In contrast, teachers with a greater perception of teaching attitude are more likely to be more committed and invest more effort in their teaching, have more enthusiasm toward their teaching, be more willing to try new teaching pedagogy to better meet the needs of their students, and are more resilient to challenges (Tschannen-Moran & Hoy, 2001). That's why Isoda in Marsigit (2007) indicated that in the process of preservice teacher education, it is important to develop teacher's perspectives; and, learning to listen is a keyword for this approach.

This situation generates a challenge for the researcher to investigate the implementation of LS whether it is in the right track so that it would be advantageous for all, teachers, students, and schools. Therefore the study of teacher's perception on the implementation of LS is interesting to be investigated for the sake of increasing the quality of education in Indonesia. As the implementation of LS in Sukabumi, especially in English subject, it is necessary to reveal the implementation process on the teachers' side point of view. The study is intended to (1) investigate the perception of English teachers toward LS and (2) to know the process of LS program implemented in research site.

In line with the objectives of this study, there are three research questions as the main problem in this study. (1.) What is the perception of English teachers toward Lesson Study? And (2) How is the program of Lesson Study conducted in MGMP of English of Kota Sukabumi ?

## Perception

Perception, According to *Oxford Advance Learner's Dictionary* (1995: 305), means the way of seeing or understanding something. In this case, the English teachers' way of seeing and understanding of LS in Kota Sukabumi. Perception is the set of processes by which an individual becomes aware of and interprets information about the environment. It refers to the way we try to understand the world around us. We gather information through our five sense organs, but perception adds meaning to these sensory inputs (Bahrick 2009, Suparyanto 2011). Psychologically, Mussen (1973: 68) explains that perception is the process by which information acquired through the sensory receptor (eyes, ears, nose, and skin) is transformed into a percept of what we think, see, hear, smell, taste, or touch. He adds that perception is a creative process that involves much more than simple transformation of stimulus energy by the sensory receptors (see Mussen, P., and Mark R. Rosenzweig. 1973; Matlin W. M. 2003; Feldman, R. S. 1995; Slameto, 2003).

## The Definition of Lesson Study

Lesson Study, previously Lewis & Tsucida (1998) called it Research Lesson, is a direct translation for the Japanese term *jogyokenkyu*, which is composed of two words: *jogyo*, which means lesson, and *kenkyu*, which means study or research (Suratno, 2012; Fernandez, 2002; Yoshida, 1999). As denoted by this term, LS consists of the study or examination of teaching practice. They engage in a well-defined process that involves discussing lessons that they have first planned and observed together. These lessons are called *kenkyujogyo* (Lewis & Tsucida, 1998), which is simply a reversal of the term *jogyokenkyu* and thus literally means study or research lessons, or more specifically lessons that are the object of one's study. Study lessons are “studied” by carrying out the steps described next in an attempt to explore a research goal that the teachers have chosen to work on (e.g., understanding how to encourage students to be autonomous learners).

## Characteristics and Components of Lesson Study

Lesson study has many characteristics which are very beneficial for teacher and students to improve the effectiveness of teaching and learning activity in the classroom (Emilia, 2010 p. 8). These are the list

of characteristics of LS, which have been discussed by several researchers including Yoshida (1999); Takashi, Watanabe, Yoshida, and Krismawan as cited in Halilah (2011) and Emilia (2010 p. 8-9)

- a. LS keeps students at the heart of the process. LS provides the opportunity to the teacher to understand learning process.
- b. LS helps teachers see classroom practice (teaching and learning) in a concrete form. Teachers are helped to understand new teaching ideas and develop a clear image of what good teaching practice entails.
- c. LS is a form of research. LS offers chance to teachers to make their practice as a research and themselves as researcher. They can be testing hypothesis in the classroom, collecting student data, reflecting or analyzing.
- d. LS can provide a form of systemic and sustained professional development. LS is driven by teachers thus it can continuously develop their professionalism. Besides, teacher collaboration creates common understanding of instruction, curriculum, goals of education, etc. Thus, it makes consistent learning condition for students.
- e. LS is not just about time lesson. LS provides the opportunities for the teachers to partake in intensively thinking deeply about instruction, learning; curriculum, education, etc.

### The steps of Lesson Study

The steps of LS have been discussed by many educators. These include, Yoshida (1999); Cerbin and Kopp (2006 p. 251); Hendayana (2011) Susilo and Supriyatna cited in Emilia (2010:10) and from the study of Halilah (2011). Fernandez and Yoshida (2004 p. 7-9), on the other hand, also promote six steps for structuring a good LS, which are (1) Collaboratively Planning the Study Lesson, (2) Seeing the Study Lesson in Action, (3) Discussing the Study Lesson, (4) Revising the Lesson (Optional), (5) Teaching the New Version of the Lesson (Optional), and (6) Sharing Reflections about the New Version of the Lesson. While Hendayana (2006) simplified the steps of LS into three steps namely Plan, Do and See.

## 2 RESEARCH METHODOLOGY

This study is largely a qualitative research design taking on characteristics of a case study. The case study is considered as the appropriate research method for this study because it focuses on a particular phenomenon, situation or event (Cohen

et.al, 2007). In addition, as a type of qualitative study, it has some advantages in investigating a phenomenon in detail so that it can bring enlightenment (Alwasilah, 2002) to the people involved in the study and the readers of the research paper.

The site of this study is MGMP (English Teachers' Association) of Kota Sukabumi that serves as a forum for professional development and exchange of experiences in teaching innovations. Education Office of West Java Province intends to implement LS through MGMP-based. The participants of this study are 30 (thirty) English teachers of Junior High School in Kota Sukabumi who are involved in implementing LS at least for one semester.

To collect the data, three techniques are employed in this study; these are observation in the process of LS, questionnaire, interview and classroom observation.

## 3 FINDINGS AND DISCUSSION

The questionnaire and interview reveal that participating teachers have positive perception about lesson study. From the results, there is a clear indication that teachers in Indonesia show strong favour of MGMP-based lesson study since it provides their needs for continuous professional development that can strengthen sense of collegiality among teachers, because teachers have been kept isolated inside the closed door of their classrooms and left alone in dealing with the whatever problems they face. More than 85% of the respondents admit that participation in lesson study cycle has encouraged them to work collaboratively, thus lead them to form a stronger sense of collegiality. However, the positive perception has not come with a genuine need of lesson study proven by the attendance which has never been 100%. Moreover, the reflection sessions grow less exciting with fewer participants actively involving in discussions while the other become passive listeners. Further investigation is needed to investigate the reason of the increasing number of passive participants.

Furthermore, based on the interview, it is found that some teachers are being pessimistic of lesson study stating that it is just another government program running solely on government project grant. They think it will be better motivating if it is teacher-initiating program. They perceive that since it is a government project, it will soon die out once the grant over and another new program will commence before lesson study sustains its objectives.

It also revealed that senior teachers are less enthusiastic to attend a lesson study session. It might show that the teachers' seniority also plays a pivotal factor to inflict in lesson study. Fewer senior teachers attend the program than the younger teachers. When asked about their unwillingness, they respond that this activity is just not for them anymore. It is assumed that they are reluctant to move out of their comfort zone of teaching. Any change from their current method of teaching might be perceived as more work to do; and they think they are too old for new teaching “tricks”.

### **The process of Lesson Study**

To know the implementation of LS in English MGMP Kota Sukabumi observation is used to catch the actual condition of the program. The data show that LS is realized into 10 meetings.

In the planning phase, teachers practice cognitive empathy, looking at the subject matter from the student's point of view, working to understand how students learn. When planning the lesson, teachers try to anticipate how students will perceive, interpret and construe the subject matter and the lesson activities.

In *do* and *observation* phases, one member of the group teaches the lesson, and other group members attend the class to observe and collect evidence of student learning, thinking and engagement. Traditional classroom observations tend to focus on what the teacher does during the class period. Lesson study observations lessons focus on students and what they do in response to instruction.

After the lesson is taught, while it is still fresh in everybody's minds, the team members and the outside invited observers hold a debriefing meeting to discuss and analyze the lesson. Teams may want to establish a few ground rules for the discussion, e.g., focus on the lesson (not the teacher) and on analyzing what, how and why students learned or did not learn from the experience. During the debriefing participants offer their observations, interpretations and comments on the lesson. The purpose is to analyze and evaluate the lesson thoroughly in terms of student learning, thinking and engagement. After the debriefing, the team holds additional meetings to further organize and analyze their findings.

Lack of attention is clearly shown in the reflective discussion sessions. The same questions are repeatedly asked, which are only successful to demonstrate the participants' inattentiveness on the

previous sessions which already discussed the problems and had come up with the solutions.

### **Things to be concerned**

Based on the study which is in line with Harnita (2010) proposed, there are three things which should be considered in implementing Lesson Study.

#### **a. Understanding the culture**

Cultural factor is one of the factors mentioned by teachers in this study which they perceive as a significant factor in implementing lesson study. It is important to prepare proper culture to implement Lesson Study as teachers should be ready to accept critics, and has many guess in the class. One should be open-minded and motivated to elevate their quality through learning from others, share what they know and willing to change into better teacher.

#### **b. Understanding the concept**

The concept of lesson study centers at improving teachers' individual capacity by working collaboratively with colleagues and sharing experiences in classroom practice. Thus, it challenges teachers to move out from their comfort zone. It is about improving teachers' interaction, facilitating and supervising direct change in classroom practice and maintaining renewed expanded networks between schools-university-board of education.

#### **c. Understanding the cycle**

Instead of started with what the teachers are most comfortable teaching, lesson study cycle should be started with careful need analysis that the students mostly need and are lacking of. Then it followed by applying the lesson plan in the classroom which is observed by others. Finally the findings are discussed in reflection. And it is not an instant process that the result will be suddenly felt by the participants.

## **4 CONCLUSION**

The study showed that almost 90% of Indonesian teachers tend to have positive perception towards the lesson study concept which is MGMP adopting.

In summary, teachers learn mostly through collaborating with other teachers from Lesson Study especially in reflection session. They also plan together, apply the lesson and reflect what is going on in the classroom. They look closely at the students' activities, students' work, students' behavior, and share what they see to learn from the learning situation. Teachers in this study reported

that by working together and using the Lesson Study process they built a stronger set of teaching skills, became more aware of student learning needs, and developed strategies to meet those needs.

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## Developing a Model of Microteaching Lesson Study for English Student Teachers

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**Abstract:** The low English proficiency of Indonesian students can be traced to the low quality of the English teachers. The efforts to increase the quality of English teachers should start from the institution producing English teachers through the courses required for completion of a teaching degree. One of the substantial courses is microteaching as a practicum course preparing English student teachers to engage in authentic practice. Combined with lesson study, microteaching results in microteaching lesson study, that is a combination of microteaching and lesson study in which the student teachers, following the cycles of lesson study, practise teaching in front of the small groups of their peers or K-12 students. Some recent studies on microteaching lesson study (Cavin, 2007; Molina, 2012; Wood and Cajkler, 2013) reveal that microteaching lesson study is effective to enhance student teachers' content knowledge, pedagogical knowledge, and soft skills. Unfortunately, among those studies none was conducted in English subject for English student teachers. This study aims at proposing to develop a model of microteaching lesson study for English student teachers. The methodology proposed is research and development.

**Keywords:** microteaching lesson study, English student teachers, research and development

### 1 INTRODUCTION

The 2012 English Proficiency Index that measured the average English language ability of adults in the countries around the world ranked Indonesia in the level of low proficiency, that is on the 27<sup>th</sup> rank among 54 countries (Education First, 2012: 5). Despite the fact that Indonesian students have learned English for at least six years in secondary school, one of the key factors that influence the success or failure in learning English is unquestionably the English teachers. Thus, the low English proficiency of Indonesian students can actually be traced to the low quality of the English teachers.

So far, many efforts have been taken to improve the quality of in-service English teachers through various programs sponsored by government or educational institutions from Indonesia and abroad. However, few, if not rarely, efforts are found dealing with the preservice English teachers. In fact, to increase the quality of English teachers, the efforts should be better started from the institution producing English teachers, that is teacher education.

Molina (2012) argues that teacher education is an area in need of reform if we want to increase the performance of students. Furthermore, Darling-Hammond (in Molina, 2012) asserts that below average student performance is also a result of the lack of teacher preparation. From several factors influencing teacher preparation, Molina (2012) states that one important component is the quality of the courses required for completion of a

teaching degree. One of those substantial courses is microteaching as a practicum course preparing English student teachers to engage in practice-based experiences.

Combined with lesson study, microteaching results in microteaching lesson study, that is a combination of microteaching and lesson study in which the student teachers, following the cycles of lesson study, practise teaching in front of the small groups of their peers or K-12 students. Microteaching lesson study is one various modification of lesson study and based on the principles of lesson study developed in Japan.

Some recent studies on microteaching lesson study (Cavin, 2007; Molina, 2012; Wood and Cajkler, 2013) reveal that microteaching lesson study is effective to enhance student teachers' content knowledge, pedagogical knowledge, and soft skills. Unfortunately, among those studies none was conducted in English subject for English student teachers. Most studies were in the fields of mathematics or science.

Moreover, as each phase of microteaching lesson study follows those of lesson study that requires different knowledge and skills and as not all English student teachers have experienced teaching, the implementation of microteaching lesson study for English student teachers might bring about some constraints. To cope with such constraints, the English student teachers need to be prepared in every phase of microteaching lesson study by raising their awareness in each phase.

Therefore, this study aims at proposing to develop a model of awareness raising-based

microteaching lesson study for English student teachers. The methodology proposed is research and development.

## 2 REVIEW TO RELATED LITERATURE LESSON STUDY

Originated in Japan, Murata (2007) states that lesson study is a collaboration-based teacher professional development approach. It is a process in which teachers progressively strive to improve their teaching methods by working with other teachers to examine and critique one another's teaching techniques Baba (2007: 31). This is in line with Cerbin and Kopp (2006: 250) who mention that lesson study is a teaching improvement and knowledge building process.

Dubin (2009: 31) asserts that the main objective of lesson study is not being able to come up with the best lesson. Instead, it is to engage teachers in a research process that will help them improve their teaching as lesson study provides a framework for teachers to think deeply about content and student learning as well as give them an opportunity to learn from each other. Fernandez and Yoshida (2004: 2) also note the same idea that through lesson study not only do teachers plan lessons together, but they also go on to observe these lessons unfold in actual classrooms and to discuss their observations.

In doing lesson study, Baba (2007: 2) cites that there are three main steps of lesson study, namely preparation, actual class, and class review sessions. Cheng and Yee (2012: 36) explain those three steps in detail into eight steps, i.e. (1) define a problem to guide the work, (2) plan the lesson, (3) teach and observe the lesson, (4) evaluate and reflect on the lesson, (5) revise the lesson, (6) teach and observe the revised lesson, (7) evaluate and reflect a second time, and (8) share the results.

### 2.1 The Benefits of Lesson Study

Murata (2007: 2) notes that lesson study incorporates many characteristics of effective professional development programs identified in prior research. Among those characteristics are site-based, practice-oriented, focused on student learning, collaboration-based, and research-oriented. Elipane (2012: vii) also emphasizes on collaboration as he states that “the essence of lesson study lies in the amount of intellectual and affective engagement of its participants who engender a spirit of collaboration- working on a shared goal that they themselves generated.”

McLaughlin and Talbert (in Cheng and Yee, 2012: 35) claim that one benefit of lesson study is that the teachers “are more likely to

innovate their teaching practice as they continually rethink their practice based on how students learn”. Another benefit of lesson study, according to Rock and Wilson (in Cheng and Yee, 2012: 36), is serving as “a catalyst to encourage teachers to become more reflective practitioners and to use what they learned to collegially revise and implement future lessons”.

Cerbin and Kopp (2006: 253) argue that lesson study embodies five elements of teaching, i.e. vision, design, interactions, outcomes, and analysis. Therefore, they state that lesson study is an effective way to promote long term teaching improvement since lesson study “ scaffolds reflective practice in which instructors carefully examine goals for student learning and development, design goal-oriented learning experiences, conduct a lesson, observe and analyze student learning and revise the lesson design to improve learning.”

Furthermore, Fernandez et al. (in Molina, 2012: 4) report the benefits of lesson study that include improved content knowledge for teachers, enhancement of teacher pedagogy, higher teacher self-efficacy and motivation, development of teacher ability to observe and focus on student learning, improved teacher reflection ability, and creation of collaborative networks for teachers.

### 2.2 Micro Teaching Lesson Study

Microteaching lesson study is a modification of lesson study to be used for preservice teachers at university level. Molina (2012: 3) explains that microteaching lesson study is similar to lesson study in that “microteaching lesson study engages preservice teachers in cycles of lesson development, implementation and revision of an assigned topic while teaching to small groups of their peers in their university classrooms or small groups of K-12 students”.

This is in line with Fernandez (in Molina, 2012: 20) who explains that microteaching lesson study “incorporates aspects of microteaching with central elements of lesson study”. This forms an experience that is designed to challenge preservice teachers' conceptions regarding teaching and learning while simultaneously encouraging their connection between theory and practice.

In addition, Molina (2012: 4) states that in microteaching lesson study, preservice teachers work in groups of at most three in conjunction with a microteaching lesson study mentor. The microteaching study mentor is the same as the outside specialist in lesson study because they are knowledgeable in the lesson content, content area teaching, and lesson study. The topic for microteaching lesson study is purposefully selected with an overarching student learning goal in mind.

Meanwhile, the aspect of microteaching that is taken for microteaching lesson study is that teaching small groups of peers or small groups of K-12 students. Other aspects include teaching a shortened lesson (approximately 25 to 30 minutes) and the use of video to capture teacher lesson for later analysis.

### 2.3 Previous Studies in Microteaching Lesson Study

Fernandez and Robinson (in Molina, 2012) in their 2006 research on microteaching lesson study for secondary Mathematics preservice teachers reveal that microteaching lesson study is beneficial for preservice teachers. Those preservice teachers felt the collaboration, analyses, and reflection on shared experiences were beneficial to their learning to teach.

The recent research by Fernandez in 2010 (in Molina, 2012), reported that Mathematics preservice teachers’ engagement in microteaching lesson study deepened their understanding of the content and enhanced their ability to teach. Other benefits include the development of preservice teachers’ ability to recognize teaching a lesson as a learning process not building a skill, textbooks are not the authority on curriculum, and preservice teachers began to integrate classroom management strategies into their lesson design.

### 2.4 Awareness Raising-Based Microteaching Lesson Study

Microteaching lesson study can be a valuable way to enhance student teachers’ content and pedagogical knowledge as well as to foster the collaborative reflective practices of student teachers and so prepare them to be creative autonomous teachers. Those benefits can only be achieved if student teachers can go through all phases of microteaching lesson study successfully.

In fact, each phase of microteaching lesson study that follows those of lesson study requires different knowledge and skills. In lesson planning phase, student teachers are required to have knowledge not only on planning a lesson but on how to cooperate with other peers to design research lesson as well. In observation phase, it takes knowledge of observation as well as fastidiousness to know what to observe. If student teachers do not succeed in this phase, it will hinder to improve their students’ learning and not enable them to do the next important influential phase, i.e. reflection, well.

Furthermore, as student teachers are not yet teachers and most of them have not experienced teaching, they are not yet internalized with the spirit of teaching and day-to-day teaching activities. This

means that they have not fully belonged to pedagogic communities practice yet (Wood and Cajkler, 20130). Thus, doing microteaching lesson study can be an overwhelming task for them as they must follow some phases in which each phase requires different skill and knowledge.

Gebhard et al. (1990: 25) suggest that “teacher educators need to be aware of how the interaction within and across each activity can enhance or hamper opportunities for student teachers to gain the investigative and decision-making skills they need to become more creative autonomous teachers”. In other words, it is utmost importance to provide student teachers with practices that will enable them to go through each phase successfully if microteaching lesson study is to reveal all its benefits and not hamper its advantages. This can be done by raising student teachers’ awareness in each phase

## 3 METHODS OF THE STUDY

### 3.1 Approach of the Study

The present study proposed belongs to the research and development method. Richey and Klein (2007: 1) call it developmental or development research, which then name it design and development research. They (2007: 1) define design and development research as:

“the systematic study of design, development and evaluation processes with the aim of establishing an empirical basis for the creation of instructional and non-instructional products and tools and new or enhanced models that govern their development”.

In conclusion, Richey and Klein (2007: 1) assert that design and development research is a way to establish new procedures, techniques, and tools based upon a methodical analysis of specific cases.

### 3.2 Research Procedure

Richey and Klein (2007: 39) mention that design and development research use a broad collection of traditional methods and strategies, both quantitative and qualitative. This view is in line with Ross and Morrison (in Richey and Klein, 2007: 42) who state that “quantitative and qualitative approaches are more useful when used together than when either is used alone...(and) when combined, are likely to yield a richer and more valid understanding”. Furthermore, Richey and Klein (2007: 40) explain that which methods to be selected and how these methods are employed depend on the nature of the research problem and question.



Therefore, this study employ both qualitative and quantitative methods. Meanwhile, for the steps in conducting the research, the cycle of research and development proposed by Borg and Gall (1983) will be adopted that consists of four phases, namely exploratory phase, model development phase, model field-testing phase, and dissemination phase.

### 3.3 Exploratory Phase

In the exploratory phase, the research and information collecting are conducted. The aim of this phase is to examine the existing model of microteaching lesson study for English student teachers and the weaknesses of the existing model. The method of the research used in this exploratory phase is qualitative method.

The data will include ten private universities in Central Java. The source of data will be available from the microteaching lecturers and the head of English Education department from those universities. Meanwhile, to collect the data, the instruments used will be documentation, questionnaire, and interview.

The output from this exploratory phase will be the existing model of microteaching lesson study, the weaknesses of that existing model, and the need analysis to develop a new model of microteaching lesson study for preservice English teachers.

#### 3.3.1 Model Development Phase

In the model development phase, the aim is to develop a preliminary model of microteaching lesson study based on the result from the exploratory phase. This is done through trying out the model of microteaching lesson study.

The mechanisms of this phase comprise of three steps. They are trying out the model of microteaching lesson study, monitoring and evaluating the process and the result, and revising the model of microteaching lesson study.

To conduct the try-out, the place will be the English Education Department of Muria Kudus University. This will be done in the even semester where the microteaching course is offered. This phase will involve the microteaching lecturers and the seventh semester students joining the microteaching course.

The data of this phase will be in the form of qualitative data, that is the effectiveness of the try-out of the model of microteaching lesson study. The instruments used to collect the data will include observation, questionnaire, focus group discussion, and interview. The output of this model development phase will be a model of awareness raising-based microteaching lesson study accompanied with the lesson plan for microteaching course.

#### 3.3.2 Model Field-Testing Phase

The model field-testing is the phase to test the model of awareness raising-based microteaching lesson study for English student teachers. The strategy used is true experiment design with control and experiment groups.

The subjects of this research will be the students taking the microteaching course at Muria Kudus University. The sample of the study will consist of two classes: the control and experimental groups. The output from this model field-testing is the model of awareness raising-based microteaching lesson study for English preservice teachers.

#### 3.3.3 Dissemination Phase

The last phase of the research is dissemination. Here, the model of awareness raising-based microteaching lesson study for English student teachers will be disseminated in academic seminar or conference either nationally or internationally. The result of the research will also be published in academic journal.

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## Lesson Study, a Training Approach To Strengthen the Professional Competence of Teachers in Senegal

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**Abstract:** This paper reports on a case study of an initiative aiming at strengthening professional competence of primary school teachers in Senegal: Strengthening Mathematics, Science and Technology Education Project (PREMST). Training needs assessment of teachers revealed some challenges, which necessitated the birth of this Project. The identified problems are presented as the following:

- lethargy manifested in a great number of « Cellule d'Animation Pédagogique » (CAP, or Cluster training) ;
- poor mastery of subject contents ;
- lack of teaching materials along with difficulties of their use in classroom ;
- various challenges in teaching methods ;

PREMST was conceived as a part of solutions in the process of resolving these problems. In Phase 1, the emphasis was laid on the revitalization of Cluster training, by developing training modules and accompanying tools according to the training needs of teachers. In Phase 2, the Project initiated a lesson study model in the regions of Louga, Thies and Fatick in 2011 before expanding in eight regions out of fourteen in 2012.

The implementation of lesson study is well underway, and the model that is being built in this process gains the increasing support from various actors in education. Today, the challenge is still finalizing the model to have an effective tool in the management of teacher training.

**Keywords:** CAP, lesson study, empowerment

### 1 INTRODUCTION

In Senegal the Continuing Professional Development (CPD) of teachers is based on strategic options and regulations defined in the following statutes:

The improved service training of elementary teachers is a major challenge for achieving the objectives of the Ministry of National Education.

The new program called "Improvement of the Quality of Fairness and Transparency (PAQUET) Program has set the priorities in education and training :

- improving the quality of teaching/ learning,
- promoting the development of the teaching of science, technology and innovation.

The empowerment of teachers is a strategic option in enhancing their professional competence. In this context, the Project Strengthening the Teaching of Mathematics, Science and Technology (PREMST), with the assistance of Japan International Cooperation Agency (JICA), began in 2007 with the aim of building capacity of teachers to improve school performance.

With lesson study, adapted as a CPD model since 2011, teachers develop their skills before, during and after the implementation of a lesson.

In this process, the observation and discussion of lesson was conducted with a focus on one aspect and three indicators. It was strongly recommended

to respect the whole process of studying lessons, from the planning to the writing of records of discussion.

The experimentation underway in Senegal, beyond profits in the functioning of cells provides a professional capacity building of teachers. and strengthening the professional skills of teachers.

In this paper, after this introduction, I present:

- Challenges of our system
- PREMST's contribution
- Results obtained
- Prospects
- Conclusion

### 2 CHALLENGES OF OUR SYSTEM

The challenges identified by the Ministry of Education are:

- Low levels of mastery in mathematics and science (according to the results of SNERS 2012) which is confirmed by the results of the baseline study conducted by the Project at the beginning of phase 2 in 2012.
- The low quality of learning as evidenced by the completion rate is 66.6% in 2012 in Primary Education.

These results are not strangers to the multiple constraints such as:

- The weak professional qualification with the existence of a mass of teachers without

- initial training;
- Lack of effectiveness of initial and continuing training of teachers in particular;
  - The weak educational and administrative management at all levels;
  - The insufficient number of inspectors of education, who are in charge of providing pedagogical support to teachers;
  - The overcrowded classes not favoring close monitoring of students;
  - The weak learning assessment system.
  - lethargy manifested in a great number of “*Cellule d’Animation Pédagogique*” (CAP). CAP is a monthly meeting with a cluster of neighboring schools for mutual learning. The participation in CAP is a professional obligation for all teachers, as defined in the presidential decree 79-1165;

Training needs assessment of teachers revealed some challenges, which necessitated the birth of this Project. The identified problems are presented as the following:

- poor mastery of subject contents;
- lack of teaching materials along with difficulties of their use in classroom ;
- various challenges in teaching methods.

### 3. PREMST’S CONTRIBUTION

#### 3.1. Modules and tools

In response to these challenges, the project has undertaken a series of educational responses :

- Provide, based modules, the terms of practical implementation of psychological and pedagogical principles underlying the teaching-learning process and secondly to CAP within the framework of implementation of.
- Develop modules for managing large groups taking into account the technical implementation of sub-groups and communication within sub-groups and between sub-groups.
- Train teachers to develop and use a variety of assessment tools and quality-assurance tools.
- Train teachers on learner-centered pedagogy.
- Train teachers in effective use of the curriculum.

PREMST was conceived as a part of solutions in the process of resolving these problems. In Phase 1,

the emphasis was laid on the revitalization of CAP training, by developing training modules and accompanying tools according to the training needs of teachers.

A total of twelve modules were shared with teachers. Constraints in the organization of training sessions in face mode, among others, distance education has been proposed in the expansion areas during phase 2 of the project. The learning process begins with self- training modules for a month before the grouping performed in the CAP. This method puts the teachers to be trained in a new context of training. The teacher has a working time which allows him to prepare for reunification by the appropriation of content modules and by holding its training manual. The teacher has a working time which allows him to prepare for reunification by the appropriation of content modules and by holding its training manual. The reunion is a time for sharing learning experiences between the members of the cluster training.

The fact that the developed modules are highly appreciated by teachers, the National and Regional Teams demonstrates significant capacity to develop the training modules based on the teachers’ needs.

The relevance of the project is reflected by the modules adapted to the needs of teachers integrating the learner-centered approach in accordance with the principles of active methods practiced in classrooms. It is also reflected by the management system, which makes the most of the organizational system of education by way of training teachers through the existing structure of training, namely CAP. The training contents of program met the needs of teachers and are in accordance with the renewal of education program, called the Curriculum of Basic Education (CEB). CAPs are therefore revitalized in their operation, and the project reach in CAP was extended nation-wide in 2013.

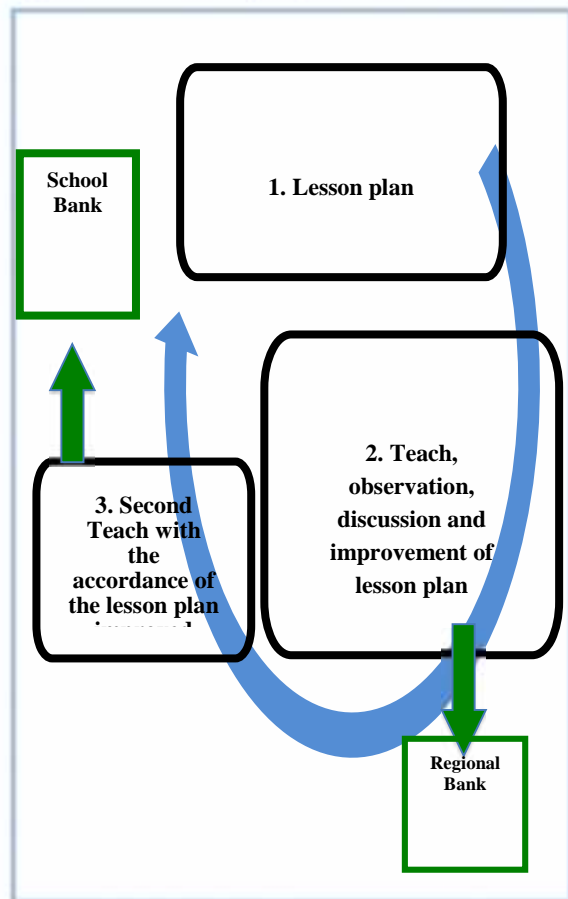
### 3.2. Lesson study’s model

#### 3.2.1. What is Lesson Study ?

The lesson study offers an innovative process involving teachers in the planning, the implementation of a lesson, and a critical analysis of this implementation in order to improve the quality of the lesson. The participation of resource persons gives an opportunity to discuss on the best classroom practices.

This device provides information on the process of professional development based on the examination of teacher practice. The goal is to make teachers able to work on the lessons to analyze the teaching / learning process and contribute to the improvement of student achievement .

Figure 1 : Lesson study’s cycle



#### 3.2.2. Annual planning

At the beginning of the academic year, three lessons are selected. considering the difficulties faced by teachers in science, mathematics or technology. Three cycles of lesson study are carried out every year One cycle of lesson study consists of 1) lesson preparation, 2) lesson observation, discussion and improvement of lesson plan, and 3) second implementation of lesson (See Figure 1). For each cycle, an aspect of focus is selected from the three aspects defined in the lesson observation sheet: 1) planning, 2) activities and attitudes of teachers, and 3) activities and attitudes of the learner. Furthermore, to guide the discussion after lesson observation, 3 out of 30 indicators in the lesson observation sheet are selected before preparing the lesson.

For a good analysis of the lesson, the comments focus on the items retained by the group. They must be objective and constructive.

#### 3.2.3. Step One : Preparing the Lesson

The planning is done, based on a number of proposals from the teachers in each CAP :

- What will be the aspect of focus?
- Which indicators should be selected for the focus of discussion?
- What is the level of control by the students hold in the lesson?
- What are the difficulties in conducting lessons, constraints related to the use of teaching materials ?

From these proposals, teachers choose the subject of the lesson.

A group of teachers writes a lesson plan and submit it to the discretion of other teachers in the school or any other person who can help them. One member is appointed to conduct a lesson in a classroom at the time of CAP training.

This approach provides professional development and offers the possibility to reduce the large gap observed in teachers' skills.

#### 3.2.3. Step two : Teach, observation, discussion and improvement of lesson plan

During the CAP training, 4 hours of training period is divided in seven different moments as the following:

##### 1st moment : Reminder of the aspect of focus in the lesson observation

The facilitator is responsible for reminding the participants the aspect and the items to be focused.

**2nd moment : Implementation and observation of the lesson**

A teacher implements the lesson. All participants observe and take notes of the progress of the lesson. The discussion is conducted in a plenary session after the lesson observation. These sessions are also opportunities to improve the capacity of facilitating a plenary session.

**3rd moment : Self-Assessment**

The teacher who conducted the lesson is called to do his self-evaluation, focusing on the indicators selected.

**4th moment : Analysis and proposals for improvement**

Working groups are formed to make suggestion for improving the lesson presented. Each group will make proposals for improvements.

**5th moment : Sharing synthesis and proposals**

In the plenary session, groups present their productions. The facilitator organizes exchanges with all participants and ensures the involvement of participants. The teaching team which was responsible for preparing the lesson plan must resist the temptation to be defensive in the analysis.

**6th moment : Summary of proposed improvements**

The facilitator conducts the synthesis of proposals for improvement.

**7th moment : Integration of proposed improvements**

Based on the summary of the facilitator as well as the proposals adopted by the whole group, the Secretary revises the lesson plan. The propositions that cannot be written in the lesson plan sheet are written in the record of discussion.

The improved lesson plan will be reproduced by each CAP member school for the second implementation of lesson.

**3.2.4. Third Step : Second Implementation of lesson**

The second implementation of lesson aims at consolidating achievements and strengthening the achievements of teaching teams. The head teacher of each school, in cooperation with its teaching staff, is

responsible for the implementation of the improved lesson, by organizing school-based training.

**3.2.5. Bank records:**

The work done around the lesson that has been the subject of the study is documented and disseminated. This requires:

- improved lesson plan, record of discussion accompanied by the film of lesson;
- selection of the best lesson plan sheets at the regional level;
- make booklets that are deposited in the libraries in different regional branches of the Ministry of Education.

**4. RESULTS OBTAINED**

**4.1. Quantitative component**

**4.1.1 Strengths and contributions**

The implementation of lesson study is well underway, and the model that is being built in this process gains the increasing support from various actors in education. This brought significant results as evidenced by the fact that 28,500 teachers in 700 CAPs are now covered in the eight targeted regions, and approximately 80% of these teachers actually participate in lesson study sessions. The fact that today practically all schools in these regions are involved in the practice of lesson study favorably prepares the smooth scale-up of the model nationwide. The number of teachers covered will be increased to 52,500 in 1,300 CAPs when the Project expands the lesson-study model nationwide in 2015. PREMST has the added value and has revitalized the CAPs.

CAP has become opportunities for contract teachers to prepare for their professional examinations obtaining of qualified teacher status. During these sessions , teachers observe and critique the performance of their colleagues.

By this means, CAP has become a model of horizontal training, which promotes mutual learning among teachers, as opposed to a vertical training model.

According to the mid-term evaluation report conducted by JICA, the teachers had actively participated in the training organized in the CAP, which led to the improvement in their behavior and their teaching competence. The results of monitoring and evaluation conducted by the project show that both indicators of Project Goal reached the target

level one year before its termination. The results of monitoring in the classroom in 5 departments have used the tool of the lesson observation in June 2013 show an average score of 1.55 (targeted goal : 1.50) indicating a satisfactory level for teachers.

(See **Table 3** below)

Table 3: Analysis of Lesson Observation

Indicators	Baseline		Increase
	(2011 Feb) (n=68)	June 2013 (n=46)	
Average score of teacher's Lesson Observation	1.36	1.55	0.19
Percentage of teacher obtained 1.5 or more	42.6%	54.3%	11.7

Source: BLS and Project M&E Report

#### 4.1.3. Weaknesses and difficulties

The main weaknesses are related to the time management assigned to the CAP training, considered too short for the volume of work to be done in groups. At the time of discussion, teachers have difficulties keeping the focus on the aspect and the items selected.

Grossly insufficient monitoring by supervisory staff and resource persons does not help teachers overcome these difficulties. The lack of monitoring and evaluation at all CAP sessions by the supervision body of inspection is one of the weaknesses of the training system, not limited to that of PREMST, but of Senegal in general. The monitoring and evaluation reports highlight these weaknesses. The reasons for this low rate are the lack of the means of transportation as well as frequent rescheduling of CAP.

In some schools, the workload of school due to overlapping of functions (Director and Head of class time) Directors prevent accompany the project activities properly.

During group work, the goal of group work as a tool to help kids is often not clear. It is therefore necessary to clarify the aim of the working group to address the learning of children.

Regarding the work on evaluating the quality of the lesson and improvement in CAPs , discussions are conducted. However, the facilitators had difficulties in synthesizing various observations and formulate final proposals to improve the lesson.

#### 4.2. Qualitative component

The school inspectors and departmental inspectors working with the inspections, members of teams (national, regional and local), school directors, and pedagogical teams have expressed their interest for the PREMST through their real involvement and participation. They have all confirmed that PREMST is an essential support to the development of quality education and a special appreciation was given to the techniques of class management used. Moreover, the methodology is recognised by all as efficient and it generates considerable changes in the operation of classic CAP as regards vulgarisation and appropriation of contents tackled. The level of replication of competencies acquired in classrooms have been judged as satisfactory especially with the use of ASEI / PDSI forms, the creation of substitution material and the good command of instruments used for geometrical figures.

With lesson study, the theory is complemented by class practice. However, the implementation of a more effective mechanism for monitoring is needed. With respect to the sustainability of PREMST, the various commitments of the Ministry of Education (political, technical and financial) show that PREMST is not isolated, it is attached to the policy and priorities of the Government of Senegal. It is necessary to recall the relevance of the program, which offers a rich array of services expected by the beneficiaries. We should also mention the satisfaction of the members of the body control and supervision to the base ( inspectors) who are ready to make a clear commitment in the footsteps of the PREMST and become more involved in the renewal of teaching practices mathematics, science and technology. Accordingly, PREMST has many chances to see these acquired last.

#### 5. PROSPECTS

The implementation of the lesson-study model is the opportunity for a technical dialogue between Senegal and Japanese experts. This is fueled by thoughts, dialogue, production and monitoring results on the ground consolidates the results and improves gradually and complete the model under construction by the end of the project. Interest given



to problem solving targeted as a part of the lesson study raises the commitment of teachers and supervisors, which ensures the success of the initiative.

The recommendations of the mid-term evaluation notes the necessity of improving the CAP training monitoring coverage by inspectors. Furthermore, to ensure the sustainability beyond project termination in 2015, it was recommended to:

- (1) Design central government activities that are necessary to maintain the PREMST CPD model in Regional, Departmental, CAP, and school level. This may include:
  - (a) the possibility of continuing the National Review Workshop every year after project termination;
  - (b) the Development of the terms of references of the Ministry of education to indicate its responsibility to maintain the model beyond 2015;
  - (c) Prepare a 3-5 year action plan, possibly commencing 2015.
- (2) Discuss the possibility of utilizing PREMST outputs (modules, model, personnel, etc.) in other activities within the ministry.

## 6. CONCLUSION

The lesson-study model that PREMST proposes is an important strategic option in the context of the implementation of the PAQUET. The difficulties encountered in the field must be considered and be resolved. They challenge not only the policy makers on policy issues, but also the technicians of Education with respect to their ability to provide the right managerial and technical measures to the difficulties faced by teachers.

If the quality of learning experiences some significant progress with the implementation of PREMST, there remain challenges in the implementation of these innovative practices in mathematics, science and technology.

The paradigm shift in terms of classroom practice remains to be done, especially because of the conservative nature of teachers. Efforts are being made to improve the monitoring of the implementation of activities. The prospect remains the completion of the construction of the model advocated by the PREMST. The paradigm shift in terms of classroom practice remains to be done, especially because of the conservative nature of teachers. Efforts are being made to improve the monitoring of the implementation of activities. The prospect remains the completion of the construction of the model advocated by the PREMST.

It is also necessary to open the technical dialogue with other countries for improving further the lesson study model of Senegal, which is still under construction.

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## Effectiveness Training Program Teaches In Preparing Teachers for Technical Education Model Based on Context, Input, Process and Product

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**Abstract:**

The purpose of this study is to identify the effectiveness of teaching practice program in providing the technical education teachers based on the Context, Input, Process and Product Model. The evaluation based on the CIPP Model from input, process and product, which was introduced by Stufflebeam in year 1971. Total of 127 students from program Technical and Engineering Education were chosen as a respondent by using random sampling. The pilot study was done in order to determine reliability and suitability of the questionnaire. The data were analyzed using SPSS version 16 software and findings were presented in the form of the frequency, percentage, mean and standard deviations. The inferential statistic such as Pearson Correlation was used to identify the relationship between the knowledge, skills, experiences, generic skills, confident, achievement, and attitude with the teachers trainee achievement. The ANOVA was used to identify the significant differences between the knowledge, skills, experiences, generic skills, confident, achievement, and students attitude according to Technical and Engineering Education program 4 SPA, 4 SPE, 4 SPJ, and 4 SPH. Therefore, the research suggested that more effort have to be done to improve towards the effectiveness teaching practice program in providing the technical education based on the Context, Input, Process and Product Model.

**Keywords:**

knowledge, skills, experiences, generic skills, confident, achievement, and students attitude)

### 1 INTRODUCTION

According to Abdul Raof Dalip ( 1991), teaching is a very important component in a teacher training program. Through teacher training, trainees will be able to show and practice behavior - behavior intended to teach effectively and try to use all the theories that have been exposed to during the course of their education. In addition, teaching can provide a lot of opportunity and opportunity to all student teachers to gain early experience before they enter the teaching profession to be applied later. In the course of teaching practice, trainees receive instruction, guidance, opinion, advice, criticism and formative and summative evaluation of teaching as a supervisory process towards more effective teaching.

According to Abdul Hamid Awang ( 1979 ) teachers' training has become an important part of any system of teacher training. It is a requirement that required every student to teacher training. This training was the first opportunity for the students to try practicing the theories, methods and approaches available in the lecture rooms. Success of teaching depends on the harmonious relationship and understanding that exists between the headmaster, teachers and students of teacher training supervisor

'A. All difficulties and problems related teaching practices can be developed to overcome if there is cooperation and understanding between them.

During teaching practice run, student teachers are guided and supervised by supervisors specially appointed by the university. In addition to carrying out the task of guiding and supervising, supervisor also assigned to formative and summative evaluation of the performance of student teachers ( Omar Shariff, et al, 1994). Trainee teachers must try to show that he has such factors as the foundation of education, mastery of academic subject matter, the use of pedagogical principles and character expected. With this supply then one is eligible to practice and practice the skills taught in the classroom. Although the student teacher is observed and evaluated for various administrative purposes, but the rationale for supervision is to improve teaching. The goal is to produce teachers competent authority.

Thus, teaching is carried out in a university in Malaysia is a student teacher in training for a period of time to gain experience teaching in real classrooms in schools. In the process of producing future teachers efficient and totally dedicated to his work, it is hoped that future teachers will be aware of the responsibilities and requirements for training. This fits with the philosophy of supervision is an

overreach process toward the formation of an individual that has the properties of a noble educator.

Effectiveness Training Program Teaches In Preparing Teachers for Technical Education Model Based on Context, Input, Process and Product. Training program organized by Universiti Teknologi Malaysia is one of the conditions required for the teacher to be eligible to become a teacher. Teaching practice was the first opportunity for prospective teachers to practice the theories, methods and approaches derived from lectures.

According to Kamaruddin ( 1986 ) teaching is an important course in the teaching program. In this program, trainee teachers in teaching and learning situations are real. In its interactions with the teaching and learning situations, they have the opportunity to foster teaching competence, broaden and gain insights in the theory and practice of teaching and learning. This program will certainly help the trainees when they go out to teach later. Teaching was the beginning of the teacher trainees to gain experience in schools, particularly teaching experience, know the real school environment and matters related to the management of secondary schools. Teaching practice also exposes trainees to appreciate the meaning of the teaching profession and enjoy teaching job with an open mind. Run for 12 weeks teaching practice, have yet to determine the ability of a student teacher to teach in a real school. As is known, the issue of teacher quality is often questioned and debated by members of the public and educators. According to Siew (2003 ) states that all people yearn for a proper education for their children that grow well in the area of cognitive, effective and psychomotor. So, no wonder people are very interested and concerned about teachers who are entrusted to provide knowledge and skills and guidance to their children whether qualified or not.

According to T. Subahan Mohd Meerah (1991), academic knowledge is in the individual, However high, not enough to make it an effective future teachers. This is because the effective delivery of knowledge covering the same matters of guidance, training, and example, through the process of teaching and learning, a key measure or indicator showing the actual work of a teacher. There are two questions that have arisen, namely the first is what are the characteristics that should be present in a person to be called a teacher a good teacher. Secondly, the teaching practice as conducted now able to setup and initial experience of trainee teachers before they actually entered the teaching life later.

According to Abdul Raof Dalip ( 1991), teaching is an important aspect of teacher education programs. Teaching is seen as the culmination of

training in preparing a student teacher himself qualified and competent teachers. Training teaches trainees the opportunity to gain practical experience in the classroom than what he has learned in class. In other words, during their teaching practice, teacher trainees to use their educational theories and principles of teaching and learning in real situations in the classroom.

According to T Subahan Mohd Meerah ( 1991), again, teaching emphasizes the teaching of a subject. While teaching professionals claim is more than that. Now teachers face many social pressures. Among others, the problems related to the discipline and the demands of parents and the community are concerned about academic achievement. With the training program must take into account the ability of student teachers in academic and all aspects of education.

According to him, in the course of teaching in schools is not just to ' teach ' only. They shall carry out all forms of teaching that allows students to gain knowledge, to preserve knowledge, do exercises mastered by the students, including giving them the competence to understand, noting the lesson, do the exercises or tests, to do a project on the subject being taught and expected to deliver education through subjects taught. In addition, an efficient trainees must master the subject is taught to ensure effective teaching. Therefore, student teachers need to have more knowledge before becoming a teacher of the caliber. Experience a 12-week student teacher teaching practice is not enough to make them become a teacher of the caliber.

According to Mohd Salleh Width (1998 ) training in the teaching profession is not enough. Although they had attended and received training in teaching but when they become practicing teachers mostly less fully. So the authority of a teacher from the discredited by society.

To demonstrate the effectiveness of teacher training, trainee teachers should look for opportunities to learn specific skills as much as possible. Each teacher who teaches training for several weeks should acquire skills in the teaching profession. Trainee teachers should take the opportunity to learn teaching skills of trained and experienced teachers in the school are housed. It is important that student teachers have some sort of skills to deliver effectively. According to Abdul Raof Dalip ( 1991) stated a student teacher started the lesson will be taught skills, asking questions, using examples, using the blackboard, close the lesson, use of teaching aids, and reinforced by various stimuli. Skills like these that have earned during their teaching practice because these skills are necessary so that the teacher can handle high-quality education. The question is whether the

teacher trainees undergoing 12 weeks of teaching practice in schools designated the opportunity to learn the skills that have been disclosed.

According to Ibrahim (2001), an effective training program is a training program that can be fully practiced in the workplace. This factor is important in ensuring that the skills gained can be applied to actual experience in everyday life and in the working world soon.

Thus, the student teacher should be very hard to overcome the deficiencies remaining in teaching. This is important in ensuring the effectiveness of teaching practices in providing technical education teachers.

## 2 OBJECTIVES OF THE STUDY

There are several factors identified cause of non-effectiveness of teaching students of Technical Education and Engineering. Therefore, the purpose of this study is to achieve several objectives. Among the objectives to be achieved are :

- Identifying effective teaching of input dimensions of knowledge and skills in Technical and Engineering Education in providing technical education teachers based on the Model Context, Input, Process and Product.
- Identify the effectiveness of the teaching dimension of experience, generic skills and confidence of Technical Education and Engineering in providing technical education teachers based on the Model Context, Input, Process and Product.
- Identify the effectiveness of teaching from the product dimension achievements and attitude of Technical Education and Engineering in providing technical education teachers based on Model Context, Input, Process and Product.
- Identify whether there is a significant correlation between the effectiveness of the teaching of input dimensions of knowledge and skills in Technical Education and teacher training Engineering student achievement 4 years of Technical Education and Engineering.
- Identify whether there is a significant correlation between the effectiveness of the teaching of the process dimension of experience, generic skills and confidence of Technical Education and teacher training Engineering student achievement 4 years of Technical Education and Engineering.
- Identify whether there is a significant correlation between the effectiveness of the teaching of the product dimension of the achievement and attitudes of Technical Education and teacher training Engineering

student achievement 4 years of Technical Education and Engineering.

- Identify whether there is a significant difference between the knowledge, skills, experience, generic skills, confidence, achievement and attitudes of students in Technical and Engineering Education program 4 SPA, 4 SPE, 4 SPJ, and 4 SPH.

## 3 METHODOLOGY

This study aimed to gather information and data on the training program of the student and Technical Education Engineering by the 4 SPA, 4 SPE, 4 SPJ, and 4 SPH. The data collected to determine the effectiveness of the teaching of aspects can be provide the knowledge, skills, experience, generic skills, confidence, achievement and attitudes. This design was chosen due to appropriatereview the effectiveness of teaching practices in providing education teachersModel based technical Context, Input, Process and Product.

### 3.1 Population and samples

The population of this study was the students of the Faculty of Education of the Technical Education and Engineering students in the 4 SPA, 4 SPE, 4 SPJ, and 4 SPH at Universiti Teknologi Malaysia Skudai, Johor, which has undergone a 12-week teaching practice in schools designated. The study population consisted of 184 students trained to teach consists of 4 SPA, 4 SPE, 4 SPJ, and 4 SPH. Hence, the number of samples is 127.

The sample in this research has used simple random sampling method. Researchers want effectiveness of the training program in providing technical education teachers based on the Model Context, Input, Process and Product. The participants were students from the Faculty of Education at the University of Technology Malaysia. Then the researchers want to focus on student 4 of Technical Education and training Engineering teaches only. Therefore, the respondents were students in 4 SPA, 4 SPE, 4 SPJ and 4 SPH. Azizi (2007) how to make a random selection is to write each name or code on different slips of paper. Furthermore, the slip of paper folded, put in a container and shaken. After that, every slip is achieved by randomly until ready access to the required number of 127.

Determination of sample size in this study is based on the method used by Krejcie and Morgan (1970) in Azizi Yahaya (2007). according to Krejcie and Morgan, the procedure for determining the sample size is based on the following formula:

$$S = \frac{X^2 NP (1-P)}{d^2 (N-P)} + X^2 P (1-P)$$

- S = sample size
- X<sup>2</sup> = Table Chi-square value for 1 degree of freedom in required confidence level 0.05 (3841)
- N = size of the population
- P = ratio of population (estimated to be 0.50 to the maximum sample size)
- d = degree of accuracy is expressed as a ratio of 0:05

**3.2 Intrumentation**

The researchers used questionnaire techniques to obtain feedback and data collection. According to Mc Millan & Schumacher (1984), states that the survey study is very popular by using questionnaire technique apart from interview techniques . The use of questionnaires can also improve the accuracy and authority granted by the sample as it is not influenced by the researcher (Mohd Najib , 1999) . This also coincides with the views of Colombo Palan (1984) asserted that the questionnaire is an instrument that is often used by researchers in descriptive studies .

Syed Arabi (1992) noted that the use of a questionnaire to study the format is very suitable because it is more practical, efficient and saves time as well as learning . Even the questionnaire to avoid bias to the interviewer situations where it gives an opportunity to the respondent an opportunity to think when giving answers. In addition, the researchers feel that this questionnaire will help achieve the objectives of the study with more accurate and efficient .

This is consistent with the opinion of the Wolf ( 1998), which explains that the construction of the questionnaire was based on several assumptions which respondents answered questions freely without harassment , personality researchers did not influence the respondent , the respondent voluntarily and sincerely answer the items in the questionnaire , the respondents have knowledge or experience sufficient to answer the items in the questionnaire , respondents were able to read and understand the items in the questionnaire , the questionnaire is easy to answer and low cost compared to traditional interviews.

**3.2.1 Construction of the questionnaire**

Researchers divided the questionnaire into two parts; part A and part B. Part A involves the respondent's background and family. Part B involves items that answer the research questions being studied by researchers in terms of confidence , skills, generic skills , knowledge , experience , performance and attitude.

➤ **Section A**

Part A contains questions related to the background of te students . Respondents or subjects required

mark ( ) in the box provided for accurate and relevant to the respondent 's own self. The respondents were asked to mark ( ) on the information himself , gender, race, course , grade and name of school teaching practice during training.

➤ **Section B**

The effectiveness of the training program in preparing teachers technical education based on Model Context, Input, Process and Product in terms of the seven aspects of the knowledge, skill , experience, generic skills, confidence, achievement and attitude .

In part B of the questionnaire , the items are arranged according to research questions to be studied by the researchers of the knowledge, skill, experience, generic skills, confidence, achievement and attitude. All items are made up of positive and negative items items . For more detail, Table 3.2 shows the numbers of items that represent the questions contained in the questionnaire that was distributed .

Part B contains 56 items representing seven study variables such as knowledge , skills, experience, generic skills , confidence , achievement and attitude . All the variables are represented by 8 items . For more detail, Table 3.2 shows the numbers of items that represent the questions contained in the questionnaire that was distributed .

Table 3.1 Item according to the research questions

Division	Variables	Number Item
1	Knowledge	1,2,3,4,5,6,7,8
2	Skills	9,10,11,12,13,14,15,16
3	Experience	17,18,19,20,21,22,23,24
4	Generic skills	25,26,27,28,29,30,31,32
5	Confidence	33,34,35,36,37,38,39,40
6	Achievements	41,42,43,44,45,46,47,48
7	Attitudes	49,50,51,52,53,54,55,56

In this study , the Likert scale is used to facilitate the respondents reply . According to Najib (1999), a Likert scale was used in which the respondent and the subject is required to mark their answers on a statement on a scale from one extreme to the other extreme . Researchers have classified the Likert scale into 5 categories for ease of analysis Respondents must indicate ( ) the most appropriate answer according to their knowledge and experience . Table 3.4 shows the scores and the symbols used for the Likert scale used in this study .



**Table 3.2** Likert Scale

Level		Skor
Strongly Agree	SA	5
Agree	A	4
Uncertain	U	3
Disagree	DA	2
Strongly Disagree	SDA	1

➤ **Pilot Studies**

This pilot study is a study conducted by questionnaire used in the actual study to ensure the reliability of the questionnaire used . Azizi (2006) , a pilot study questionnaire at this level is useful for revealing the confusion and other problematic questions that exist in the questionnaire . This pilot study is designed to:

- Identify problems relating to the understanding and interpretations of the items contained in the questionnaire.
- Soliciting feedback to improve the items and questions contained in the questionnaire.
- To study the long- time required to respond to the items in the questionnaire.

The pilot study involved 10 students who were randomly selected among 4 SPH . Ten students selected 4 SPH , would not be involved in the questionnaire that will be distributed later to avoid the same answer . Based on the analysis of the pilot study , we found a Cronbach Alpha value is 0.93. Referring to Table 3.9 , the value of 0.93 is high. This indicates that the questionnaire can be used and need not be changed.

**4. RESULT**

The data analyzed is important in determining the outcome of an investigation. In this study, data were analyzed using descriptive and inferential analysis. All data are processed using the Statistical Packages for the Social Sciences Version 16 (SPSS).

The analysis below is discussed in percentage and frequency, mean and standard deviation, dimension Input That Knowledge.

Table 1 The distribution of respondents by percentage, mean, and standard deviation standard input dimension of knowledge (n = 127)

Item	Statement	SA (%)	A (%)	U (%)	DA (%)	SDA (%)	Mean	SD
1	I am able to increase their knowledge through the subjects taught after teaching practice.	11.4 (7)	71.7 (37)	14.4 (7)	1.5 (0)	0 (0)	3.23	0.47
2	I am able to increase their knowledge through the subjects taught after teaching practice.	18.9 (14)	61.4 (37)	19.6 (14)	1.1 (0)	0 (0)	3.12	0.77
3	I have always been aware of the current issues.	27.6 (14)	21.1 (11)	14 (7)	4 (2)	3 (1)	4.28	0.58
4	I have always been aware of the current issues.	20.1 (7)	65.4 (37)	14 (7)	1.5 (0)	0 (0)	3.22	0.50
5	I have always been aware of the current issues.	31.5 (14)	61.4 (37)	14 (7)	8.8 (4)	0 (0)	3.28	0.56
6	I am able to increase their knowledge through the subjects taught after teaching practice.	20.1 (7)	65.4 (37)	14 (7)	1.5 (0)	0 (0)	3.21	0.55
7	I am able to increase their knowledge through the subjects taught after teaching practice.	10.1 (7)	65.4 (37)	14 (7)	1.5 (0)	0 (0)	3.21	0.51
8	I am able to increase their knowledge through the subjects taught after teaching practice.	18.5 (14)	65.7 (38)	14 (7)	1.2 (0)	0 (0)	3.19	0.71

**Overall Mean: 4:03 Standard Deviation: 12:40**

Table 1 shows the number of respondents by percentage, mean, and standard deviation of input dimensions of knowledge. The results show that the items recorded the highest mean score and standard deviation 0:54 4:28 is the state. "I have always been aware of the current issues. "Mean is the item with the second highest mean score and standard deviation 0:55 4:25 for the statement" I am able to increase their knowledge through the subjects taught after teaching practice. "The overall mean and standard deviation of 4:03 obtained is 0.40. The overall dimension of the input at a high level of knowledge.

Table 2 Distribution of respondents according to the level, frequency and percent input dimension of knowledge

Level	Frequency	Percentage
Low	2	0.8
Moderate	17	13.4
High	109	85.8
<b>Total</b>	<b>127</b>	<b>100.0</b>

Table 2 shows the distribution of respondents by low-level, high sederhana input dimension of knowledge. It can be seen the majority of respondents were at the highest level with 109 people with 85.8 per cent and 13.4 per cent of 17 at the intermediate level. The remaining respondents, two respondents were in low level of 0.8 percent. The Skills That Dimension Input

Table 3 The distribution of respondents by percentage, mean, and standard deviation of input dimensions of skills (n = 127)



Item	Statement	SA % n	A % n	UD % n	DA % n	SDA % n	Mean	SD
9	I am skilled in handling the general classroom	14.7 (18)	19.7 (24)	8.3 (10)	11.1 (13)	0 (0)	4.08	0.58
10	I am skilled in handling the complex class	8.2 (10)	12.8 (16)	3.9 (5)	1.8 (2)	0 (0)	4.15	0.25
11	I am skilled in handling the students with special needs	20.5 (26)	11.7 (15)	7.9 (10)	0 (0)	0 (0)	4.11	0.47
12	I am skilled in handling the progress of my class	22 (28)	19.1 (24)	7.9 (10)	0 (0)	0 (0)	4.14	0.28
13	I am skilled in handling the students during practical periods	27.6 (35)	19.3 (24)	2.4 (3)	0.8 (1)	0 (0)	4.14	0.15
14	I am skilled in handling the teaching aids such as OHP and models efficiently and effectively	26.8 (34)	18.3 (23)	3.1 (4)	1.9 (2)	0 (0)	4.11	0.47
15	I am skilled in handling the students with different abilities	22.8 (29)	14.8 (19)	11.2 (14)	1.8 (2)	0 (0)	4.10	0.58
16	I can say that my skills in better than my colleagues	14.5 (18)	11.7 (15)	13.4 (17)	22.8 (29)	3.2 (4)	3.41	1.17

**Overall Mean: 4:05 Standard Deviation: 12:38**

Table 2 shows the number of respondents by percentage, mean, and standard deviation of input dimensions of kemahiran.dapatan show items recorded the highest mean score and standard deviation 0.53 4:24 which states, "I am well versed in the demonstration while making practical projects." Represented the second highest mean the item with a mean score of 4.20 and a standard deviation of 0:57 for the statement "I am skilled in handling teaching aids such as OHP and models efficiently and effectively." Overall, the obtained mean is 4.05 and the standard deviation is 12:38. The overall dimension of the input high-level skills.

Table 4 Distribution of respondents, frequency, and percent input dimension of skills

Level	Frequency	Percentage
Low	0	0
Moderate	15	11.8
High	112	88.2
<b>Total</b>	<b>127</b>	<b>100.0</b>

Table 4 shows the distribution of respondents according to low, medium and high input dimensions of skill. It can be seen the majority of respondents were at the highest level with 112 people with 88.2 percent and 11.8 percent of those 15 are at a moderate level. The remaining respondents, two respondents were in low level of 0.8 percent.

Process Dimension: Experience

Table 5 The distribution of respondents by percentage, mean, and standard deviation of the process dimension of experience (n = 127)

Item	Statement	SA % n	A % n	UD % n	DA % n	SDA % n	Mean	SD
17	I was able to experience to adapt to the school community after their teaching practice	24.4 (31)	60.3 (76)	1.0 (1)	0.4 (0)	0 (0)	4.16	0.60
18	I was able to experience to handle the students during their teaching practice	15.9 (20)	22.4 (28)	4.7 (6)	1.9 (2)	0 (0)	4.08	0.66
19	I was able to experience to get opportunity to do the lesson plan for the teaching practice	24.9 (31)	69.4 (88)	1.9 (2)	0.8 (1)	0 (0)	4.14	0.58
20	I was able to experience to attend the school activities after their teaching practice	22 (28)	19.1 (24)	7.9 (10)	0 (0)	0 (0)	4.15	0.51
21	I was able to experience to attend the school activities after their teaching practice	18.9 (24)	4.8 (6)	2.4 (3)	0 (0)	0 (0)	4.01	0.54
22	I was able to experience to get the practical skills after the teaching practice	23.1 (29)	71.1 (90)	0 (0)	0 (0)	0 (0)	4.17	0.52
23	I had the opportunity to gain experience by participating in activities outside school organized by the school	28.8 (36)	61.4 (78)	0 (0)	0 (0)	0 (0)	4.16	0.66
24	I had the opportunity to gain experience by participating in activities outside school organized by the school	17.9 (23)	54.7 (70)	14 (18)	14.4 (18)	0 (0)	3.22	1.17

**Overall Mean: 4:02 Standard Deviation: 12:37**

Table 5 shows the number of respondents by percentage, mean, and standard deviation of the process dimension of experience. The results show that the items recorded the highest mean score and standard deviation 0:56 4:24 is saying, "I was able to experience in the classroom after their teaching practice." Mean is the item with the second highest mean score and standard deviation 0.66 4:16 for the statement "I have an opportunity to experience by participating teachers' motivational programs organized by the school." Overall obtained was 4:02 mean and a standard deviation of 0.37. The overall dimension of the input at a high level of knowledge.

Table 5 Distribution of respondents according to the level, frequency, and percent dimension of the process of experience

Level	Frequency	Percentage
Low	0	0
Moderate	12	9.4
High	115	90.6
<b>Total</b>	<b>127</b>	<b>100.0</b>

Table 5 shows the distribution of respondents according to low, medium and high dimension of the experience. It can be seen the majority of respondents were at the highest level with 115 people with 90.6 percent and 12 of 9.4 percent at the intermediate level.

From the Dimension Input That Generic Skills

Table 6 The distribution of respondents by percentage, mean, and standard deviation of input dimensions of generic skills (n = 127)

Item	Statement	SA %	A %	TD %	DA %	SD %	MEAN	SD
25	The verbal communication skills are used in communication	40.2 (51)	48.0 (61)	11.4 (14)	0	0	4.11	0.67
26	The smart in using interpersonal communication	18.1 (23)	45.3 (58)	11.8 (15)	0	0	4.05	0.58
27	I am not confident in communication with students during teaching process	25.2 (32)	44.4 (57)	11.8 (15)	0	0	4.01	0.61
28	I am confident in communication with students	25.2 (32)	44.4 (57)	11.8 (15)	0	0	4.11	0.60
29	I managed to communicate with students of various levels	25.2 (32)	44.4 (57)	11.8 (15)	0	0	4.13	0.60
30	I can convey information to all students	31.5 (40)	47.3 (60)	11.8 (15)	0	0	4.20	0.60
31	I managed to create a group discussion among students during the process of R & D.	20.4 (26)	42.4 (54)	11.8 (15)	0	0	4.22	0.59
32	I can answer questions related to the scope of values	17.9 (23)	42.5 (54)	11.8 (15)	0	0	3.97	1.18

**Overall Mean: 4:01 Standard Deviation: 12:39**

Table 6 shows the number of respondents by percentage, mean, and standard deviation of input dimensions of generic skills. The results show that the items recorded the highest mean score and standard deviation 0.60 4:25 is saying, "I can communicate verbally with the students." Mean second highest score of the item represented by the mean 4:22 and standard deviation 0.59 for the statement "I managed to create a group discussion between students in the process of R & D." Overall, the mean obtained was 4:01 and the standard deviation is 0.39. The overall dimension of the input high-level generic skills.

Table 7 Distribution of respondents according to their frequency and the percentage of the dimension of the generic skills

Level	Frequency	Percentage
Low	0	0
Moderate	18	14.2
High	109	85.8
<b>Total</b>	<b>127</b>	<b>100.0</b>

Table 7 shows the distribution of respondents according to low, medium and high dimension of the generic skills. It can be seen the majority of respondents were at the highest level with 109 people with 85.8 percent and 14.2 percent of 18 is moderate.

**From Dimension Process That Confidence**

Table 8 The distribution of respondents by percentage, mean, and The standard deviation of the process dimension of confidence (n = 127)

Item	Statement	SA %	A %	TD %	DA %	SD %	MEAN	SD
17	I am confident in managing classroom effectively	15.7 (20)	79.5 (101)	4.7 (6)	0	0	4.11	0.4
24	I am confident in handling teaching and learning during the class.	18.1 (23)	79.0 (100)	2.9 (4)	0	0	4.14	0.46
25	I am confident in solving discipline problems	17.3 (22)	85.7 (109)	3.2 (4)	0	0	3.99	0.66
26	I am confident in the use of non-verbal	21.6 (28)	79.9 (101)	4.4 (6)	0	0	4.16	0.21
27	I believe using techniques that are appropriate to student's ability	27.6 (35)	69.3 (89)	3.5 (5)	0	0	4.17	0.45
28	I believe in trying something new in R & D.	23.6 (30)	70.1 (89)	5.2 (7)	0	0	4.17	0.45
29	I am confident with the ability of characteristics.	28 (36)	71.7 (91)	1.6 (2)	0	0	4.21	0.41
40	I can answer questions related to the scope of values	17.9 (23)	42.5 (54)	11.8 (15)	0	0	3.99	1.09

**Overall Mean: 4:01 Standard Deviation: 12:36**

Table 8 the distribution of the number of respondents by percentage, mean, and standard deviation of the process dimension of confidence. The results show that the items recorded the highest mean score and standard deviation 0:51 4:23 is saying, "I am confident with the abilities it themselves." Mean is the item with the second highest mean score of 4.20 and a standard deviation of 0.58 for the statement "I am confident in using the techniques of teaching appropriate to the student's ability." Overall mean obtained was 4:01 and the standard deviation is 0.36. The overall dimension of the input at a high level of confidence.

**Product Dimensions That Achievement**

Table 10 The distribution of respondents by percentage, mean, and standard deviation of the product dimension of performance (n = 127)

Item	Statement	SA %	A %	TD %	DA %	SD %	MEAN	SD
41	I feel able to implement based on the concept in the high level of learning/teaching practice	16.5 (21)	73.4 (93)	4.7 (6)	3.6 (5)	0	4.07	0.72
42	I can answer questions related to the scope of values	24.4 (31)	48.8 (62)	11.8 (15)	11.1 (14)	0	4.11	1.1
43	My teaching practice is not always in their own best interest	25.8 (33)	47.3 (60)	11.8 (15)	11.1 (14)	0	4.04	0.81
44	I follow the advice given by the lecturers to get an excellent result	31.5 (40)	47.3 (60)	11.8 (15)	11.1 (14)	0	4.29	0.57
45	I followed the advice given by the lecturers to get an excellent result	26.2 (33)	48.8 (62)	11.8 (15)	11.1 (14)	0	4.04	0.65
46	I followed the advice given by the lecturers to get an excellent result	26.7 (34)	48.8 (62)	11.8 (15)	11.1 (14)	0	4.22	0.65
47	I get a good grade based on the concept that I give during the teaching practice	26.8 (34)	48.8 (62)	11.8 (15)	11.1 (14)	0	4.13	0.75
48	I follow the advice given by the lecturers to get an excellent result	31.5 (40)	47.3 (60)	11.8 (15)	11.1 (14)	0	4.29	0.57

**Overall Mean: 4:15 Standard Deviation: 12:42**

Table 10 shows the number of respondents by percentage, mean, and standard deviation of the product dimension of achievement. The results show that the items recorded the highest mean score and standard deviation 0:56 4:30 is saying, "I follow the advice given by the lecturers to get an excellent result." Mean second highest score of the item represented by the mean standard deviation of 4:29 and 0:57 for the statement "I strive to do their





best in training taught to get an excellent result. "Overall mean obtained was 4.15 and the standard deviation is 0.42. The overall dimensions of performance products at the highest level.

**From Dimension Products That Attitude**

Table 12: Distribution of the respondents by percentage, mean, and The standard deviation of the product dimension of attitude (n = 127)

Item	Statement	SA % (n)	A % (n)	LD % (n)	DS % (n)	SDA % (n)	MPAN	SD
40	I view a good teacher as secondary students.	18.1 (23)	68.5 (87)	11.3 (15)	1.6 (2)	0	4.03	0.60
39	I am a teacher who always maintain.	29 (37)	61 (78)	10.7 (14)	0.4 (1)	0	4.11	0.67
38	I am a person who good teacher act.	23.1 (30)	63 (81)	9.9 (13)	0	0	4.29	0.54
32	I am a teacher of discipline.	24.1 (31)	61 (78)	8 (10)	1.1 (1)	0	4.12	0.64
33	I am able to adhere to the school community.	26 (33)	62.2 (79)	1.7 (2)	9.8 (13)	0	4.19	0.57
31	I am concerned about the welfare of students.	26 (33)	65.5 (84)	8.9 (11)	0.8 (1)	0	4.7	0.48
35	I have a responsibility that with the career of a teacher.	21.1 (27)	62.2 (79)	11 (14)	1.1 (1)	2.1 (3)	4.09	0.67
34	I am not prepared to accept criticism from others.	15.1 (20)	38.6 (49)	1.1 (1)	26 (33)	8.1 (11)	3.97	1.04

**Overall Mean: 4:05 Standard Deviation: 12:43**

Table 12. Shows the number of respondents by percentage, mean, and standard deviation of the product dimension of attitude. The results show that the items recorded the highest mean score and standard deviation 0:54 4:29 is stating "the second highest mean is represented by an item with a mean score of 4.20 and a standard deviation of 0.58 for the statement" I am concerned about the welfare of students. "Overall mean obtained was 4:05 and the standard deviation is 0.43. The overall dimensions of performance products at the highest level.

**Teaching Effectiveness Program With Performance Teaching**

**Teaching Achievement**

In this section, the results of the study presented. The statistical methods used is the Pearson correlation. The results are reported based on the study objectives. The results showed that there is no relationship with this conclusion, there was no significant correlation between the effectiveness of the dimensions of input, process and product performance training. 4th year students of Engineering and Technical Education.

Table 14 Analysis of the relationship between the effectiveness of the input dimension knowledge and achievement, teaching training

Achievement in teaching Practice	Significant	Pearson, r
Knowledge	0.208	-0.112

\* Significant at the 0.05 significance level

Table 14 shows the relationship between the effectiveness of input dimensions of knowledge and achievement training. The strength of the relationship between independent variables and the dependent variable can be identified by reference to Guilford guidelines included in chapter three. The value of 'p' is 0.208 which is higher than the 'p' set of 0.05. Thus, the null hypothesis is accepted and there is no significant correlation between the effectiveness of input dimensions of knowledge and achievement training. From the table above it can be seen that the strength of the relationship between the effectiveness of input dimensions of teaching knowledge and achievement is very weak with the 'r' is -0.112. The correlation coefficient ( r ) showed a negative relationship between the effectiveness of input dimensions of knowledge and achievement of teaching practice is an inverse relationship.

Table 15 Analysis of the relationship between the effectiveness of the input dimension teaching skills and achievement

Achievement in teaching Practice	Significant	Pearson, r
Skill	0.558	-0.052

\* Significant at the 0.05 significance level

Table 15 shows the relationship between the effectiveness of input dimensions of achievement skills training. The strength of the relationship between independent variables and the dependent variable can be identified by reference to Guilford guidelines included in chapter three. The value of 'p' is 0.558 which is higher than the 'p' set of 0.05. Thus, the null hypothesis is accepted and there is no significant correlation between the effectiveness of input dimensions of teaching skills and achievement. From the table above it can be seen that the strength of the relationship between the effectiveness of input dimensions of teaching skills and achievement is very weak with the 'r' is -0.052. The correlation coefficient ( r ) showed a negative relationship between the effectiveness of input dimensions of teaching skills and achievement is an inverse relationship.

Table 16 Analysis of the relationship between the effectiveness of the process dimension namely the achievement of teaching experience

Achievement in teaching Practice	Significant	Pearson, r
Experience	0.717	-0.032

\* Significant at the 0.05 significance level

Table 16 shows the relationship between the effectiveness of input dimensions of knowledge and achievement training. The strength of the relationship between independent variables and the dependent variable can be identified by reference to Guilford guidelines included in chapter three. The value of 'p' is 0.717 which is higher than the 'p' set of 0.05. Thus, the null hypothesis is accepted and there is no significant correlation between the effectiveness of the process dimension of teaching experience and achievement. From the table above it can be seen that the strength of the relationship between the effectiveness of the process dimension of teaching experience and achievement is very weak with the 'r' is -0.032. The correlation coefficient (r) showed a negative relationship between the effectiveness of the process dimension of teaching practice experience and achievement is an inverse relationship.

Table 17 Analysis of the relationship between the effectiveness of the process dimension achievement of generic skills teaching

Achievement in teaching Practice	Significant	Pearson, r
Students Generic skills	0.416	-0.073

\* Significant at the 0.05 significance level

Table 17 shows the relationship between the effectiveness of the process dimension of generic skills in teaching practice achievement. The strength of the relationship between independent variables and the dependent variable can be identified by reference to Guilford guidelines included in chapter three. The value of 'p' is 0.416 which is more quality than the 'p' set of 0.05. Thus, the null hypothesis is accepted and there is no relationship between effectiveness and significant dimension to the process of generic skills in teaching practice achievement. From the table above it can be seen that the strength of the relationship between the effectiveness of the process dimension of the generic skills with achievement in teaching practice is very weak with the 'r' is -0.073. The correlation coefficient (r) showed a negative relationship between the effectiveness of the process dimension of generic

skills and achievement in teaching practice is an inverse relationship.

Table 18 Analysis of the relationship between the effectiveness of the process dimension of confidence with Achievement in teaching Practice

Achievement in teaching Practice	Significant	Pearson, r
Students Confident	0.211	-0.112

\* Significant at the 0.05 significance level

Table 18 shows the relationship between the effectiveness of the process dimension of confidence with Achievement in teaching Practice. The strength of the relationship between independent variables and the dependent variable can be identified by reference to Guilford guidelines included in chapter three. The value of 'p' is 0.211 which is better quality than the 'p' set of 0.05. Thus, the null hypothesis is accepted and there is no relationship between effectiveness and significant dimension to the process of confidence in teaching Practice Achievement. From the table above it can be seen that the strength of the relationship between the effectiveness of the process dimension of confidence with Achievement in Practice teaching is very weak with the 'r' is -0.112. The correlation coefficient (r) showed a negative relationship between the effectiveness of the process dimension of confidence with Achievement in Practice teaching is an inverse relationship.

Table 19 Analysis of the relationship between the effectiveness of the product dimension Students Achievement and achievement in teaching Practice

Achievement in teaching Practice	Significant	Pearson, r
Students Achievement	0.036	-0.187

\* Significant at the 0.05 significance level

Table 19 shows the relationship between the effectiveness of the product dimension students achievement and achievement in teaching Practice. The strength of the relationship between independent variables and the dependent variable can be identified by reference to Guilford guidelines included in chapter three. The value of 'p' is 0.036 which is more low than the 'p' set of 0.05. Thus, the null hypothesis is rejected and this means that there is a relationship between efficacy and significant dimension to the product of students achievement with achievement in teaching practice. From the table above it can be seen that

the strength of the relationship between the effectiveness of the process dimension of students achievement and achievement in Practice teaching is very weak with the 'r' is -0.187. The correlation coefficient (r) showed a negative relationship.

Table 20 Analysis of the relationship between the effectiveness of the process dimension the attitude of Achievement in teaching Practice

Achievement in teaching Practice	Significant	Pearson, r
Attitude	0.364	-0.081

\* Significant at the 0.05 significance level

Table 20 shows the relationship between the effectiveness of the product dimension of attitudes to teaching and Achievement in Practice. The strength of the relationship between independent variables and the dependent variable can be identified by reference to Guilford guidelines included in chapter three. The value of 'p' is 0.364 which is more quality than the 'p' set of 0.05. Thus, the null hypothesis is accepted and there is no relationship between effectiveness and significant dimension of the process of teaching attitude of Achievement in Practice. From the table above it can be seen that the strength of the relationship between the effectiveness of the process dimension of attitude Achievement in Practice teaching is very weak with the 'r' is -0.081. The correlation coefficient (r) showed a negative relationship between the effectiveness of the product dimension of attitude with Achievement in Practice teaching is an inverse relationship.

Teaching Effectiveness Program of Training and Technical Education Engineering SPA 4, 4 SPE, 4 SPJ, and 4 SPH

In this section, the results of the study presented. The statistical methods used were ANOVA. The results are reported based on the study objectives. The results showed no significant difference then with this conclusion, no significant differences according to the program of Technical Education and Engineering 4 SPA, 4 SPE, 4 SPJ, and 4 SPH.

Table 21 ANOVA analysis were significant differences between students' knowledge, Skill, Experience, Generic Skill, Confident, Achievement and Attitude according to the program of Technical Education and Engineering 4 SPA, 4 SPE, 4 SPJ, and SPH.

Skill	2.038	0.112
Experience	1.927	0.129
Generic Skill	1.605	0.192
Confident	2.009	0.116
Achievement	1.050	0.373
Attitude	2.552	0.059

\* Significant at the 0.05 significance level

Based on Table 21, using anova analysis, the results of the hypothesis shows that the students' knowledge,  $F= 2.329$   $p= 0.072 < 0.05$ , Skill,  $F= 2.038$   $p= 0.112, < 0.05$ , Experience,  $F= 1.927, p= 0.129, < 0.05$ . Generic Skill  $F=1.605$   $p= 0.192, < 0.05$ , Confident,  $F= 2.009$   $p=0.116, < 0.05$ , Achievement,  $F= 1.050, p= 0.373, < 0.05$  and Attitude  $F= 2.552, p= 0.059, < 0.05$  value of 'p' the significance level set was 0.05. The value of 'p' is higher than 0.05. This means that all the null hypothesis is accepted, then there is no significant difference between the students' knowledge, Skill, Experience, Generic Skill, Confident, Achievement and Attitude in Technical and Engineering Education program 4 SPA, 4 SPE, 4 SPJ, and 4 SPH.

## 5. CONCLUSION

One of the professional development program is meant to teach a training program for prospective teachers who take special education degree as offered by UTM Faculty of Education. Prospective teachers should be evaluated and reviewed its effectiveness for improving the quality of education as set out by the Inspectorate in 2001. Furthermore, this is supported by Abdul Ghafar (2003), states that teaching is one of the important aspects of teacher training courses. Teachers said teachers are trained teachers who have completed their studies in teacher training colleges or educational institutions. When they are exposed to a variety of courses related to teacher knowledge and education. Teaching course not perfect if not followed by practical training.

Education is one of the key factors in achieving the National Mission and teachers play an important role in ensuring this success. Therefore, teachers need to understand, commitment and a strong commitment in implementing new initiatives and approaches in their effort to improve the quality of education as expressed through the Education Development Master Plan 2006-2010 in the fifth thrust of dignifying the Teaching Profession. Actually teaching provides an opportunity for prospective teachers to identify more closely with the duties of a teacher in the classroom and their roles as teachers.

	F	Significant
knowledge	2.395	0.072

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## The Development of Lesson Study in Malaysia

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**Abstract :** Lesson Study, an approach practiced by Japanese teachers to improve their teaching practices has gained much publicity in late. In Malaysia, Lesson Study started off by researchers merely for their research projects and postgraduate dissertations. In the year 2011, the Teacher Education Division of the Ministry of Education Malaysia initiated and implemented Lesson Study in 289 schools nationwide with a goal to improve teachers' teaching practices. This move has indeed sparked strong interest and helped to promote Lesson Study in Malaysia. This paper aims to present and discuss the route taken as well as the future path for Lesson Study to evolve in Malaysia. It was not a steady start but an imperative move in the context of teacher professional development. It was a challenge to change teachers' mindset and the teaching norms that has sturdy engrained in the school working culture. Nevertheless, positive and encouraging signs were noted when teachers acknowledged that they have gained and learned much while working together with their peers. Research findings thus far have suggested that the school administrators have a very prominent role to promote the practice of Lesson Study. It is very important that Lesson Study be carried out by the teachers not merely for the sake of instruction from the higher authorities but rather the awareness to improve their teaching. Hence, it is timely that practicing teachers learn to shoulder the professional responsibility of their own development to enhance their teaching practices.

**Keywords :** teacher professional development, collaborative culture, teachers' mindset, time constraint

### 1. INTRODUCTION

Lesson Study is a form of teacher professional development practised decades ago in Japan. According to the literature, Lesson Study was already well established in the 1960s (Fernandez & Yoshida, 2004). Small groups of teachers (4 or 5 teachers) would meet regularly, to plan, implement, evaluate, and revise lesson plan collaboratively. It is organized and initiated by the teachers themselves as study groups at school or district level to improve teaching competency. In Japanese term, it is known as *kenkyuu jugyou*, which means *research lessons* or *Lesson Study*. The main purpose of Lesson Study is to enhance teachers' pedagogical knowledge and skills through peers' review, critique and collaboration among teachers (Shimahara, 1998). It is an on-going practice as a form of teacher professional development especially in elementary schools throughout Japan.

Research studies seem to share a common vision and view of effective professional development. In examining and exploring issues pertaining to teacher professional development, a consensus on principles of effective professional

development was achieved (Darling-Hammond & McLaughlin, 1995; Loucks-Horsley et al., 1996; Guskey, 1997; Hawley & Valli, 1999; Elmore, 2002). It suggested the principles of effective professional development as follows :

- Focus on student learning and outcome
- Opportunities for teachers to develop knowledge and teaching skills
- Based on collaborative problem solving
- School-based
- On-going and continuous support

When comparing the literature of effective professional development and process of Lesson Study, it seems clear and obvious that Lesson Study holds a promising and innovative approach to enhance teacher professional development. Although Lesson Study is widely practiced in Japan, and had shown considerable success in some countries, the same may not necessarily be true in the Malaysian context due to the cultural and educational system differences. It is noted that Lesson Study practice requires teachers' commitments, dedications and strong desires to excel and improve teaching knowledge and skills. Hence, when Lesson Study is implemented in the real context, this could be an

indirect evaluation of the Malaysian teachers' professionalism.

## 2 LESSON STUDY IN MALAYSIA

The development and growth of Lesson Study in Malaysia can be divided and discussed in three major parts: postgraduate studies, research based projects and programmes initiated or carried out by the Ministry of Education Malaysia (MOE).

### 2.1 Postgraduate Studies

Lesson Study started off in 2003 when Chiew and Lim (2003) piloted the Lesson Study with a group of five trainee mathematics teachers who were undergoing teaching practicum in a secondary school. Adopting the Japanese model of Lesson Study as elaborated by Yoshida (1999), positive feedbacks were given by the trainee teachers who expressed that they have gained much more confidence and their pedagogical content knowledge was enhanced through the Lesson Study process. Encouraged by the positive outcomes, a Lesson Study research study was conducted in two secondary schools over a one-year period for doctoral dissertation (Chiew, 2009). The aim was to investigate the influence of Lesson Study as well as the feasibility of implementing Lesson Study as a professional development programme for mathematics teachers in the Malaysian school context. The findings indicated both positive and negative responses. Among the positive responses were through group discussions and observing other teachers teach, the participating teachers claimed that they have gained and enhanced both their mathematical content knowledge and pedagogical knowledge. They also expressed that their reflective practice was enhanced when engaging in the Lesson Study process. In addition, the participating teachers also reported that Lesson Study has promoted a collaborative culture that enhances professional collegial bonds within their mathematics colleagues. However, several constraints highlighted by the participating teachers in implementing Lesson Study were (i) time factor, (ii) heavy school workload, (iii) shyness and reluctance to be observed by colleagues and (iv) teachers' attitude and commitment.

Similarly, Ong's (2010) doctoral study involved ten mathematics teachers in two different schools and data was collected over a period of fifteen months. The study found that the experienced mathematics teachers moved away from routine factual questions which focused on procedures and final answers which were used in the beginning and by the end of the study, they were able to generate

questions to probe the pupils' thinking. They used more probing and guiding questions and began to plan their questions that they wanted to ask. In that way, they worked towards reducing pupils' misconceptions through rich scaffolding questions. Conversely, only one of the three novice teachers showed changes in his questioning techniques while the other two showed a lack of confidence to change. Hence, the study concluded that changes gradually took place over multiple lesson study cycles as the participants built mathematical knowledge and questioning techniques.

In her master degree, Goh (2007) explored how mathematical thinking could be enhanced through Lesson Study collaboration in a Chinese Primary school. Despite some positive results, she claimed that teachers' commitment and time constraints are the main challenges to implement Lesson Study. All the above postgraduate studies were supervised by Prof. Lim Chap Sam of Universiti Sains Malaysia, Penang and we acknowledged that there are other postgraduate dissertations related to Lesson Study which are either on-going or had been completed in other public universities in Malaysia.

### 2.2 Research Based Projects

Using a research grant provided, an evaluation of Lesson Study implementation as a professional development programme was conducted by Lim in 2004 (see Lim, White & Chiew, 2005). This study acknowledged the positive outcomes of Lesson Study as highlighted in many other researches related to Lesson Study. In addition, the challenges faced in Lesson Study implementation could be reduced with strong support from the school administrators. Subsequently, Lim (2006) introduced Lesson Study to her 86 pre-service mathematics teachers with the aim to promote peer collaboration. The finding was similar with time factor as the major constraint for Lesson Study implementation. In another research study involving eight pre-service mathematics teachers in one of the teacher education institutes, the participants reflected that Lesson Study has enhanced their pedagogical content knowledge through self-reflection by means of sharing and exchanging of teaching ideas among them during their 12-week practicum. This has helped to build their self-confidence in preparing and writing of detailed lesson plans during their practicum (Chiew & Jong, 2009).

Another small scale research project that adopted Lesson Study as a tool for promoting the innovative use of Geometer's Sketchpad [GSP] in mathematics teaching and learning was carried out by Lim and her team during 2007-2009. For this

project, three secondary schools were involved and the challenges and constraints encountered in the implementation were within expectation. Similar to the earlier studies, the findings of this study reflected positive outcomes in several areas: (i) increase teachers' knowledge and skills, (ii) encourage sharing among teachers, (iii) making mathematics lessons more interesting, (iv) motivate teachers to explore new teaching ideas, (v) fostering collegial relationship, and (vi) opportunities for mentoring among the teachers. Compiling the teachers' experiences and the products of GSP templates, a book edited by Lim and Kor (2010) was published together with a sample video of how to carry out Lesson Study.

In 2006, under the Asia Pacific Economic Cooperation [APEC] – Lesson Study project, 11 APEC countries were initially invited to pilot Lesson Study in their respective economies and Malaysia was one of the participating economies. This project was further expanded to include 19 economies in 2007 and subsequently 21 economies in 2008. In the first year, the theme was "Innovation and Good Practice for Teaching and Learning Mathematics through Lesson Study"; the theme for the second year was "Innovative Teaching Mathematics through Lesson Study: Focusing on Mathematical Thinking" while the third year's theme was "Focus on Mathematical Communication". In line with this international project, a number of small scale research studies were carried out in a number of primary and secondary schools in Northern Malaysia and the findings were shared through international symposium organised by the Khon Kaen University of Thailand (see Lim, 2007; Lim, Chiew & Chew, 2008; Lim, Chiew & Chew, 2010; Lim, Chiew & Chew, 2011).

In 2008, with collaboration between Universiti Sains Malaysia (USM) and SEAMEO-RECSAM, another Lesson Study project had taken off which involved 10 primary schools in Penang. As reported in Cheah and Lim (2010), a series of workshops were given to familiarize the participants about the concept of Lesson Study, mathematical thinking and communication before the actual implementation of Lesson Study in the respective schools. Even though at the end of the project, four of the ten primary schools withdrew half-way, all the remaining six schools completed one to two cycles of Lesson Study. Their responses spelled out positively about Lesson Study despite of the time constraint and other challenges that remain a hurdle for implementation of Lesson Study in Malaysia. Subsequently, we also acknowledged that there are other research projects involving Lesson Study being conducted by educators and researchers in Malaysia.

## 2.3 Programmes Initiated by the MOE

As mentioned earlier, Lesson Study started with small scale research projects initiated by researchers as well as postgraduate students for their dissertations. Despite the findings disseminated earlier through research seminars and conferences, it was in 2011 that the Teacher Education Division (TED) of the MOE began showing strong interest in implementing Lesson Study to improve teachers' quality in teaching. Hence, the positive reports and outcomes from the research studies involving Lesson Study are indeed fruitful as it provided some initial and useful information for its implementation.

In early 2011, the steering committee met several times to discuss and plan the Lesson Study implementation. The project commenced in mid April 2011 whereby Lesson Study workshops were conducted in six respective zones: namely Central and South, East, North, Perak, Sabah and Sarawak. Four subjects: English, History, Science and Mathematics were targeted as these subjects are generally weak among the students. The participants for the workshops were Head of Panel of respective subject identified and officers from the district education office. Due to logistic constraint, only one subject from the 289 schools was accorded but the Lesson Study coordinator (*teacher who attended the workshop are duly appointed*) was encouraged to disseminate the concept and practice of Lesson Study to other subjects as well in the school. Prior to the workshop at each zone, a one-day briefing was conducted by the officer-in-charge of the programme: Sitti Haishah Abd Rahman (*one of the co-writer*) to the respective school principals and officers from the state education departments. The aim was to inform the principals about the Lesson Study programme as the support from the school administrators is a very crucial factor for the success as highlighted in research studies.

For this initial project, each school was mandated to carry out two Lesson Studies in the subject that had been identified. At the school level, teachers in the Lesson Study group were required to carry out the Lesson Study processes as informed in the workshop. In addition, a knowledgeable others (*excellent teachers or lecturers from teacher education institutes*) were invited and engaged in the teaching observation and reflection of the lesson. At the end of each cycle, the Lesson Study coordinator was required to submit a report to the district education office. The district education offices and state education departments would then forwarded it to the steering committee of the TED at the end of the year. Despite several constraints and challenges faced in its implementation, this programme yielded

considerable success (Sitti Haishah et. al., 2011). In addition, an Open-Class Teaching was held at SEAMEO-RECSAM, Penang to expose more teachers about this Lesson Study initiative.

Based on the outcomes of the Lesson Study implementation in 2011, a slight modification was made to the programme. It was renamed as *Professional Learning Communities* (PLC) and in addition, three other collaborative tools were added besides Lesson Study: *Learning Walks*, *Teacher Sharing Session* and *Peer Coaching*. Due to logistic constraint, only 107 schools were involved in 2012 and this was closely monitored by the officer-in-charge: Jeffri Mat Yasim (*one of the co-writer*) of the TED with support from the district education offices. The number of schools involved was then increased to 300 in 2013 and it was 394 schools in 2014. To date, the total number of schools involved in this initiative is approximately 1090 but it is merely ten percent of the number of schools in Malaysia. Concurrently, Lesson Study was also being initiated by other educational agencies of the MOE such as the Curriculum Development Division as one of the strategies to improve teachers’ teaching.

Undeniably, the TED has been working vigorously and actively promoting and disseminating the concept of Lesson Study as a school-based teacher professional development. Under the newly Malaysian Education Blueprint 2013-2025, the Professional Learning Communities will be highly promoted as one of the agenda for teacher professional development whereby Lesson Study has been identified as one of the main collaborative tools (Ministry of Education Malaysia, 2012).

### 3 LESSON STUDY: THE JOURNEY AHEAD

We acknowledged that Lesson Study in Malaysia has a long journey ahead due to the current vast reforms in education. On the positive side, the MOE has acknowledged the importance and significance of teacher professional development to improve teachers’ teaching. As stated in the McKinsey report (2007), “no education system can exceed the quality of its teachers.” The Lesson Study implemented thus far has actually bears some fruits. Several district education offices have mandated the schools within their jurisdiction to implement Lesson Study based on the encouraging feedback and results from the programme. There are also some schools through the school administrators’ own initiatives carrying out Lesson Study on their own accord. These reflected a very imperative fact, that the role of

higher authorities is very significant to the success of Lesson Study implementation in Malaysia. Secondly, these self-initiatives taken have suggested the positive perceptions of Lesson Study among educators and school administrators as a strategy and approach to improve teachers’ teaching practices.

Moreover, under the *District Transformation Programme* (DTP), excellent and experience teachers are being recruited and promoted as *School Improvement Specialist Coaches* (SISC+) since 2013. Their main tasks are to assist, coach and work together with school teachers to improve teaching practices. The Lesson Study model seems to provide a good structured framework for the teachers working together that aim to enhance students’ learning in the classroom. In fact, Lesson Study should be employed together with several other projects and programmes by the MOE. For instance, school teachers could work together in promoting *Higher Order Thinking Skills* (HOTS) among the students through the Lesson Study. It is definitely not an easy task for teachers to plan and inculcate the skills of higher thinking in teaching and Lesson Study could provide the platform for teachers to learn together in engaging higher order thinking skills among the students.

Nevertheless, despite the positive outcomes as reported by most district education offices, we observed and admitted the challenges in implementing Lesson Study. The constraints encountered are within expectations which are rather similar to the findings of research studies conducted earlier. Based on the studies conducted on Lesson Study, there were much consistency found with regards to the constraints and challenges. Chiew and Lim (2010) pointed out three main challenges: (i) time constraint, (ii) teacher’s heavy workload, and (iii) teacher’s perception of teaching observation. In fact, these factors were somehow expected due to the misconceptions and cultural factors in one’s education system. Chiew (2009) argued that much of the constraints were actually due to the lack of awareness about the importance of professional development among the Malaysian teachers. It was indeed paradoxical to observe that these teachers expressed to have gained much benefit through the Lesson Study process, yet at the same time, they were not willing to work beyond the school working hours. In addition, we observed that the degree of impacts or influences were somehow varied and limited due to the constraints faced in the Lesson Study implementation. It was noted that participating teachers who were committed and ready to embrace in Lesson Study process were found to gain far more benefits compared to other participants in the group (Chiew, 2009; Ong, 2010). Our experiences and knowledge gained thus



indicated that the change or impacts on teachers' teaching practices in general, would require much more time such as engaging in a few Lesson Study cycles over a period of three or four years before any significant changes or enhancement could become apparent.

Consequently, our immediate concern is to strengthen the monitoring system of the Lesson Study implementation. For instance, we are hesitant if the Lesson Study has been carried out according to the operating procedure outlined in the workshop. Merely relying on paper reports from the district education offices is deemed insufficient due to lack of commitment from some of the district education offices in monitoring of the Lesson Study implementation in the schools. As such, the aspects of being voluntary, life-long learning and self-initiative by the teachers to improve and commit themselves in professional development remain as main challenges that are yet to be realised in Malaysia.

### 3 IMPLICATIONS AND CONCLUSION

Although the outcomes thus far have been encouraging, the impacts of Lesson Study actually been cushioned by constraints in the implementation. As with any model of teacher professional development, the success of Lesson Study lies heavily on the teachers' commitment and attitude change towards their professional development. Hence, in some cases, the Lesson Study practice is not able to sustain among the teachers after a period of implementation. Nonetheless, despite these challenges, there is optimism for Lesson Study to thrive in the Malaysian schools. One of the supporting factors for smooth implementation of Lesson Study is the strong support and commitment from the school administrators (Chiew, 2009). With support from the top administration, it will certainly facilitate the implementation of Lesson Study in schools, particularly in terms of flexibility of time tabling and arrangement for group discussion.

Due to situational context, it is difficult to evaluate the effectiveness of any professional development programme as the nature of teacher professional development is rather long-term and developmental. Lesson Study posed to be alternative model of teacher professional development in Malaysia in long-term but these required a paradigm shift in teacher professional development which is yet to be observed in the Malaysian context. As mentioned earlier, the aspects of being voluntary, self-initiative and life-long learning by the teachers

are traits needed to overcome the challenges for Lesson Study implementation. To conclude, we strongly believe that Lesson Study poses to be a potential and promising model for teacher professional development in Malaysia.

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## THE DEVELOPMENT OF GENETICS GUIDED INQUIRY LEARNING TOOLS FOR BLENDED LEARNING THROUGH LESSON STUDY

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**Abstract:** The purpose of the research was to develop the guided inquiry learning tools for blended learning through Lesson Study (LS) to improve the quality of the genetics learning processes. The learning tools are syllabus, lesson plan and teaching materials. The research involved 5 lecturers and 1 student who are members of the LS team. Subjects were 54 Biology students who took genetics and divided into two classes, namely class A for the first LS and class B for the second LS. Data was obtained from the 13 LS activities in each class for 11 genetic materials conducted in April-July 2013. Data analysis was performed using descriptive-qualitative approach. The results showed that the input for the development of learning tools were: 1) the syntax of the guided inquiry need to be modified by adding "the students should consult to the lecturers before communicate the inquiry results to other groups"; 2) the students' activities should be adapted to the syntax of modified guided inquiry; 3) the formulation of the practical activity objectives should be more operational; 4) the concept definition should not be written in instructional materials but replaced it with an image so that the students will formulate their own definition. In terms of the implementation of the learning process the inputs were: 1) the students should consult the lecturers before doing the presentation; 2) the lecturers should provide guidance to all groups, not concentrated in certain groups; 3) the students should be motivated to actively submit questions with contextual examples. 4) students' understanding should be made clear by the use of the video that are relevant to the topic; 5) the presented inquiry results should be uploaded to the web in words and power point for blended learning. The results of research and development showed improvement in the quality of the learning processes of genetics. This is demonstrated by: 1) increase concentration of students' learning; 2) increase abilities of students' working together in groups; 3) increase abilities and experience of the lecturers in conducting guided inquiry using blended learning; 3) increase confidence of the lecturers when implementing the learning processes.

**Keywords:** Blended Learning, Genetics, Guided Inquiry, Lesson Study

### 1. INTRODUCTION

Communication skills, problem solving, information access and management, decision-making, collaboration, cooperation and the use of a variety of advanced electronic technology need to be mastered by college students (Galbreath, 1999). Therefore, the learning process should be conducted interactively, inspiringly, excitingly, and challengingly, motivating students to actively participate and provide enough space for initiative, creativity, and independence according to their talents, interests, and physical and psychological development of students (Law No. 20 of 2003 on National Education System).

The fact, so far, shows that the practice of teaching in IKIP (Teachers Training College) PGRI Jember is still beyond the expectation, based on the preliminary survey conducted on October 12, 2012. Of the 15 biology lecturers surveyed, most of them still put students as the objects of study and still often use learning strategies which are dominated by

the lecturer. Furthermore, sharing between lecturers also has not been conducted, and they are rarely use information technology as a learning medium. Student innovation and creativity are also less developed to process information and find their own knowledge definition. The learning processes as mentioned above lead a number of problems, that is, the student learning outcome is less maximal and is not in line with the expectation. Students tend to memorize in learning, especially in the study of genetics, and they cannot connect one concept with other concepts well. In addition, students are still less critical of the problems associated with the genetics development which gives positive and negative impacts to society.

Based on the background and the problems as above, lecturers are required to make innovations in the learning process. One innovation that can be done by lecturers is to develop learning tools that can enhance the learning process. This study develops the guided inquiry learning tools on the

basis of blended learning through lesson study for genetics courses.

The guided inquiry learning on the basis of blended learning not only develops the interaction of learners but also provides a positive learning environment (Koesnandar, 2008). Guided inquiry learning on the basis of blended learning can also make students become more motivated and interested because they can do a lot of activities, access multimedia and other innovative devices through information technology.

The implementation of guided inquiry learning on the basis of blended learning can be developed to improve the quality of the learning system, which converts the conventional learning system into the constructivist learning system supported by information technology. Implementation of guided inquiry learning on the basis of blended learning can develop a number of students' process skills such as observing, formulating problems, formulating hypotheses, designing experiments, collecting and analyzing data and interpreting data, drawing conclusions based on authentic evidences and communicating the results of their inquiry activities (Schepler, et al 2003; MONE 2003a). Kulthau (2007) says that through the implementation of guided inquiry, students can conduct an investigation, exploration, searching, researching, teaching and learning.

The implementation of lesson study can help lecturers observe, pay attention to students with learning difficulties, either independently or in groups (Karim, 2006), especially to those who have low academic ability. The observations were analyzed and discussed with the team of Lesson Study to improve further learning process, so that students with high academic ability can assist students who have low academic ability, and students with low academic ability can be in the same level as those with high academic ability. Through the implementation of Lesson Study, lecturers are able to provide information and share experiences each other for their professional development (Cerbin, W & Kopp, B. 2006).

## 2. METHODOLOGY

Development of guided inquiry learning tools on the basis of blended learning through Lesson Study for genetics courses followed 4D developed by Thiagarajan (1974), which consisted of 4 stages with some modifications. The flow chart of the development of learning tools modified from 4D Thiagarajan is shown on Figure 1.

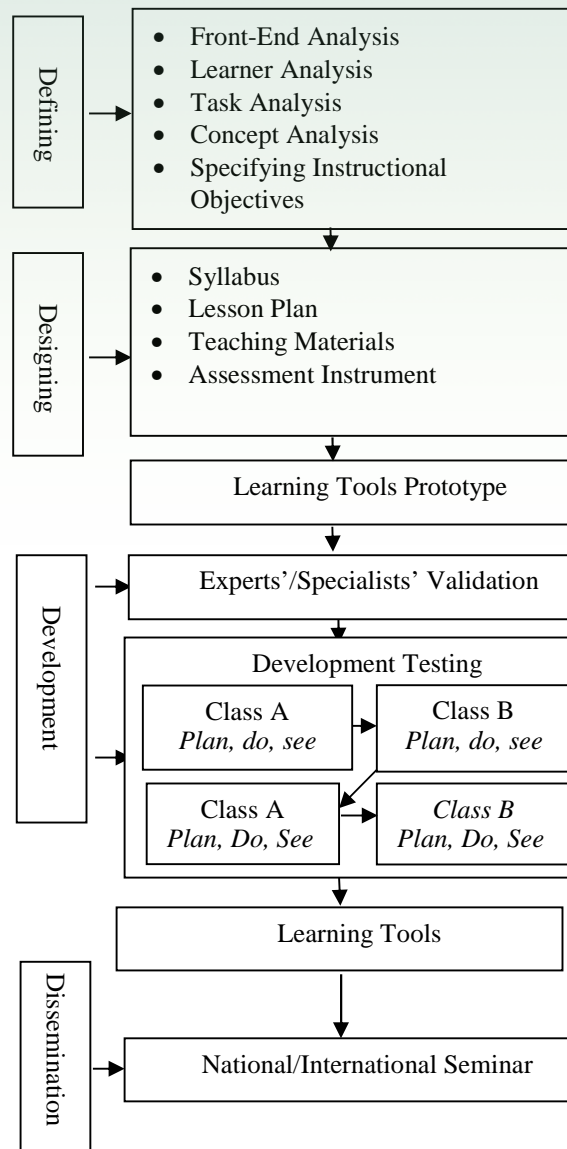


Figure 1. Flow chart of Learning Tool Development Modified from 4D Thiagarajan.

Research subjects in this study were 54 students majoring in biology education FPMIPA (Mathematics and Science Education Faculty) of IKIP (Teacher Training and Education College) PGRI Jember who took genetics courses. Research subjects were divided into two classes, class A and class B.

The developed learning tools were validated by experts/specialists. Data validated of the experts were analyzed qualitatively-descriptively. The learning tools were said good and fit for use if they reached at least 70% of the experts' consensus. LS activities were carried out within 10 cycles with 13

meetings for 10 subjects of genetics. The first LS activities were conducted in class A, and then the results of LS activity reflection in class A were used to be bases for improvement of the learning process in class B.

### 3. RESULTS AND DISCUSSION

To obtain a learning tool that met valid and reliable criteria, the researcher applied the procedures of Research and Development of modified 4D models Thiagarajan.

#### 3.1. Define stage

The step of defining was started by the activities of: 1) Front-end analysis which aimed to identify the fundamental problems needed in the development of learning tools. The problems that needed management in the study of genetics were the method of presentation of teaching materials and teaching practice that utilized multimedia technology information. PPT teaching materials that have been developed so far were only for fulfilling the lecturers' necessities during the learning process, but the teaching materials for the students were less developed. PPT teaching materials for students learning could be developed by completing the audio-visual, so that they could be learnt anywhere and anytime. PPT teaching materials for students can be uploaded to e-learning web or stored in the form of a compact disk or a flash disk that can be accessed and studied at any time by the students. Uploading the teaching materials to e-learning web directly trained and made the students familiar with the utilization and the use of information technology which is currently growing rapidly. 2) Learner analysis was carried out by examining the students' characteristics, that is, the backgrounds of academic skills (knowledge), the students' cognitive development, the individuals' skills related to the topic of learning, and genetic learning media. Within the last three years, students' learning outcome for the course of genetics was in average of 65 with C category. In 2009, the number of students who took genetics course was 82 who got marks of A (18.5%), B (37.4%), C (41%), and D (3.1%). In 2010, the number of students who took genetics course was 68 who obtained the marks of A (7.3%), B (23.5%), C (57.4%), and D (11.8%). In 2011, the total of students who followed genetics course was 59, who gained the marks of A (6.8%), B (20.3%), C (59.3%), and D (13.6%). The results are used as a frame of reference in the achievement of learning

objectives. 3) Task analysis aimed to identify the whole skills in the learning process. The researchers assessed the skills and conducted experiments in the course of genetics such as skills in doing the crossing in *Drosophila*. 4) Concept analysis was undertaken to identify the major concepts of the materials to be taught. The concepts were then arranged systematically and linked between one concept and other relevant concepts in order to form a complex concept that could be used as a means of achieving basic competencies and competency standards. The results of concept analysis for genetics course were arranged in 11 subjects in sequence from the first subject to the eleventh subject namely: genetics, Mendelian genetics, probability theory and mathematical completion in genetics, patterns of properties inheritance out of Mendelian genetics, sex linkage, sexing, crossovers and chromosome maps, chromosomal abnormalities, gene expression, population genetics, and recombinant DNA technology. These concepts were arranged systematically from the simple/basic concepts to the complex ones. 5) Specifying instructional objectives is a summary of the concept analysis and task analysis to determine the behavior of objects in the form of competence standards, basic competence and indicator. The behavior of an object was the basis for composing a test which was then integrated into the developed learning materials. Standards of competence and basic competence were illustrated clearly and completely in the syllabus and lesson plan.

#### 3.2. Design Stage

The stage of designing was performed through lesson study especially in the plan stage. At this stage, the designing of learning tools prototype was carried out which included the syllabus composition, lesson plans, teaching materials and assessment instruments. The format of learning tools prototype was used or adapted with the format developed by the National Education Standards. The format that was developed is shown in Figure 2 and Figure 3 as follows:

**SYLLABUS**

A. Course Identity  
 Course Name : .....  
 Code/Total Credits (SKS) : .....  
 Course Group : .....  
 Requirement : .....  
 Semester : .....

B. Course Description : .....

C. Competence Standard

No	Basic Competence	Subject	Learning Strategy	Indicator	Blended Learning Material	Assessment Technique	Form	Learning Source	Time Allotment
1.									
2.									

Figure 2. Syllabus Format

**LESSON PLAN**

Study Program : .....  
 Course Name : .....  
 Code/Total Credits (SKS) : .....  
 Semester : .....  
 Time Allotment : .....  
 Course Requirement : .....  
 Lecturer : .....

A. Competence Standard  
 A. Basic Competence  
 B. Indicator  
 C. Learning objectives  
 D. Learning Materials  
 E. Teaching Method  
 F. Teaching Steps

Step	Time	Blended Nature	Lecturer Activities	Learner Activities
First step				
Core step				
Final step				

G. Learning Sources  
 H. Assessment  
 -Assessment Technique  
 -Assessment Form

Figure 3. Lesson Plan Format

Specification of assessment instrument produced was in the form of questionnaire to measure learning motivation and scientific attitudes. Observation sheet was to measure learning motivation, scientific attitudes, and motor skills. Essay test and rubrics were to measure cognitive learning and critical thinking skills.

The developed assessment instruments were validated by experts/specialists and were also tried out to students who had taken genetics course in total of 58 students. Data resulted from try-out were analyzed to determine the validity and reliability. The analysis showed that 65 questionnaire items of learning motivation were all valid and reliable, 50 items of questionnaire on scientific attitudes were all valid and reliable, and of the 22 essay test items, 20 were valid and reliable, while 2 were not.

### 3.3. Development Stage

Development stage was started with the experts' validation on the developed learning tools. The results of the tools validation are shown on Table 1.

Table 1. Mean Value Results of Validation on Guided Inquiry Learning Tools on the Basis of Blended Learning for Genetics Course

Type of Tools	Mean Value of Validation					Average
	Validator I	Validator II	Validator III	Validator IV	Validator V	
Syllabus	88.71%	93.55%	89.52%	-	-	90.59%
Lesson Plan	87.47%	77.65%	88.86%	-	-	84.66%
Teaching Materials	79.95%	71.92%	-	84.82%	-	78.90%
Assessment						
Instruments:	85.11%	94.44%	88.89%	-	-	89.15%
• Motivation	85.11%	94.44%	88.89%	-	-	89.15%
• Scientific Attitude	91.67%	100%	87.50%	-	-	93.06%
• Critical Thinking Skills	85.71%	100%	89.29%	-	-	91.67%
• Psychomotor Skill						
• Cognitive Learning Outcome	82.50%	100%	88.89%	-	-	90.46%
WFR Blended Learning	-	-	-	-	79.2%	79.2%

In general, the results of the validation by experts/specialists were in good category, so that the learning tools developed can be used with little revisions, i.e.: 1) In the future, the practicum activities should be based on hands-on activity. 2) It is suggested to distinguish the concepts of gene, DNA and chromosomes for prokaryotic cells with the concept of gene, DNA and chromosomes of eukaryotic cells. 3) Be careful with the use of genetic symbols. 4) Please clarify with pictures on non-disjunction material.

The tools that had been validated by experts were then tested for tool development on the research subjects i.e. 54 students of IKIP PGRI Jember who took genetics course divided into two study groups, namely group A and group B. Development test was intended for the improvement of learning tools, and to see whether there was an increase in cognitive learning outcomes of the students. Development test of learning tool application was the second stage (*do*) and third stage (*see*) of the Lesson Study activities. Lesson Study activities were carried out within 10 cycles with 13 meetings for 10 subjects. Lesson Study activities were conducted from April to July, 2013. The results of Lesson Study activity reflection as the tool development test obtained: 1) The concept definition should not be described in the teaching materials but be replaced with images, so that the students would formulate the concept definition by themselves. 2) Students should consult the lecturer prior to the presentation. 3) Lecturer provided fair supervision to all groups in order not to be concentrated in a certain group. 4) The student group was motivated to actively give questions with contextual examples. 5) The student concept understanding of student learning was made clear by the use of the video that was relevant to the topic. 6) The results of the presented discussion were uploaded to Blended Learning in documents of *words* and *power point*.

In development test, pre-test was first conducted to determine the preliminary ability of the research subjects, and post test after development test was conducted to identify the increase in learning outcome after the learning process using the developed learning tools. The mean values of learning outcomes in class A and B are shown in Table 2.

Table 2. The Mean Value of Pre-Test and Post-Test

Assessed Aspects	Class	Pre-Test		Post-Test		Increase (%)
		Value	Category	Value	Category	
Motivation	A	58.50	Fair	90.38	Very high	31.94
	B	56.68	Fair	89.08	Very high	33.23
Scientific Attitude	A	59.36	Low	90.07	Very high	51.22
	B	59.09	Low	93.51	Very high	58.25
Cognitive Learning Outcome	A	47.96	Very low	79.11	High	64.95
	B	45.75	Very low	76.00	High	66.19
Critical Thinking Skill	A	45.66	Very low	67.26	Fair	47.31
	B	44.72	Very low	66.52	Fair	48.75

In general, Table 2 shows that there is an increase in all assessed aspects. The increases in motivation, scientific attitude, cognitive learning outcome and critical thinking skill in class B were higher than those in class A. This happened because the learning process in class B was conducted based on the results of reflection of the learning process in class A, so that the strengths and weaknesses found in class A were fixed in the learning process in class B. The implementation of guided-inquiry learning strategy on the basis of Blended learning could help students perform a variety of activities ranging from observing, questioning, explaining, designing and testing the hypothesis that optimally involved the whole student's ability to seek and investigate systematically, critically, logically and could formulate their own inventions. In line with this, Joyce *et al* (2000); Nurhadi *et al* (2004); Wahab Jeffri (2007); Handoko (2007); Bodzin *et al* (2007) argue that the implementation of the guided-inquiry on the basis of Blended learning is effective to improve thinking skills, attitudes, cognitive learning outcomes, and student leaning motivation. Wahyudin's study (2010) showed that student interest and understanding increase from 72.90% to 76.81% after the application of guided-inquiry strategy assisted by multimedia. In addition, because the implementation of genetics learning tools are based on Blended Learning, students find it helpful to access more literatures, to give broader learning rooms, to provide longer study time, as well as to provide an opportunity for students to explore and find the concepts of genetics by themselves through inquiry and use of information technology. The study by Rathomy Baisa (2010) indicates that 78.35% of the students feel interested and motivated in the learning which uses internet media.

### 3.4. Disseminate Stage

Dissemination stage was a late stage of development. Phase dissemination was done to promote the development of products that can be received by users, either individually or in group, or system. Dissemination was performed through a process of transmission to the relevant learning practitioners in particular forums such as seminar or scientific journal publication.

## D. CONCLUSIONS

Based on the validation by the expert and analysis of the test results, it can be concluded that the development of genetics learning on the basis of blended learning through lesson study can improve the quality of learning process of genetics course. This is indicated by the presence of: 1) an increase in of student concentration during the learning process; 2) an increase in ability to work together in student groups; 3) an increase in lecturers' and students' ability and experience in conducting inquiry using Blended Learning; 4) an increase in lecturer confidence when implementing the learning process.

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# The Implementation of Students Achievement Division (Stad) Combined with Lesson Study-Based Mind Mapping In General Biology Course To Improve Motivation and Concept Comprehension of Students In University of Muhammadiyah Malang

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**Abstract:** STAD (Student Teams-Achievement Division) is effective to improve student learning motivation, because STAD gives significance to reward structure as reinforcement towards what have been done by students. The reward is one aspect to increase motivation. Mind mapping is a method to manage information holistically. Mind mapping may be used to: restore information, organize information, make priority, learn to comprehend information within context, conduct a review on learning material, and retain information completely. In order to answer concept comprehension problem, the writer tried to combine STAD model with Mind Mapping. This study aimed at: (1) improving students learning motivation in general biology course at University of Muhammadiyah Malang, as well as (2) improving students' concept comprehension in general biology course at University of Muhammadiyah Malang. This study was a Classroom Action Research (CAR) Lesson Study (LS) based with two cycles. The study result showed that: 1) the implementation of STAD combined with Mind Mapping had a high learning feasibility with these steps (Plan, Do, See) derived from LS that were used for betterment in each meeting, 2) the implementation of STAD combined with Mind Mapping was proven to increase motivation and concept comprehension. For further research, the combination of STAD-Mind Mapping requires clear instructions and a better time management.

**Keywords:** STAD, Mind Mapping, Learning Motivation, Concept Comprehension

## 1 INTRODUCTION

Teaching is about delivering knowledge to students. As the consequence of this definition, students are passive because they tend to only receive information given by their teacher. Therefore, it is a teacher centered teaching (Sardiman, 2001:45). Teachers are aware of their role when they meet their students. To improve the teaching and learning quality, teachers are expected to have skill to select and apply teaching method for effective teaching (Hamalik, 2001). Hence, teachers are seen as agents of modernization in every field of life. The main effort from teacher is through education program for students.

Based on this statement, teaching quality is directly linked to the use of optimal teaching model which means in order to achieve high quality teaching, each education course or subject has to be organized with suitable organizational strategy. In addition, the knowledge should be delivered with proper strategy (Berg in Prayekti, 2006:2).

According to the survey result and the interview with the lecturer of general biology course in University of Muhammadiyah Malang held on September 16-19, 2013, it was concluded that

students' activeness and participation in learning process was quite low. There was also a lack of motivation to do self-learning; students were less motivated to study biology. Studying biology was considered boring because it required a lot of memorizing and complicated processes. Besides, students were likely to become passive and silent during the lesson. When the lecturer asked questions, students gave minimum response. Students had difficulty to connect theoretical concept of biology to the pragmatic application of the knowledge in daily life. When biological problems were introduced, students could not solve the problems. Students' various background study also influenced the knowledge acquisition, as they might come from vocational school majoring in cooking, sport, and so on.

One of the cooperative learning models which have broad application is STAD (Student Teams-Achievement Division) model. STAD is the easiest cooperative learning model compared to the other models of teaching. STAD is proven to be effective to improve students' learning motivation because STAD focuses on reward system as reinforcement

tool. The reward itself may function as a motivation booster.

Mind mapping is a teaching method used to manage information thoroughly. Holistically, mind mapping can be used to: keep information, organize information, make a priority, comprehend information in its particular context, review material, memorize information holistically, therefore, to answer the problem regarding concept comprehension, the writer tries to incorporate the STAD model and mind mapping.

STAD cooperative learning model would be implemented by the use of mind mapping teaching strategy. The aim of this corporation is for students to gain chances to have class discussion in solving the problem in students' work sheet. Another benefit of using mind mapping will be seen by the time students explain their mind map designed by their group in front of the class. By presenting, students are expected to overcome their low learning motivation and strengthen their concept comprehension. Students are more interested in creative writing technique with colors rather than the boring one. By this collaboration, it is expected that students' learning motivation can be increased so that their learning outcome improves as well.

Based on this assertion, the writer was interested in conducting a Classroom Action Research (CAR) on the basis of Lesson Study (LS) under the title of "the implementation of student achievement division (STAD) combined with lesson study-based mind mapping in general biology course to improve motivation and concept comprehension of students in University of Muhammadiyah Malang".

## 2 RESEARCH METHOD

This study was a Classroom Action Research (CAR) based on Lesson Study (LS), conducted in two cycles. In this context, a cycle means a whole set of activities ranging from planning, doing, observing, and reflecting.

The combination of CAR and LS design can be seen in Table 1 as follow:

CAR	LS	Activities
<ul style="list-style-type: none"> <li>Planning</li> </ul>	Plan	<ul style="list-style-type: none"> <li>Identifying problem and its cause</li> <li>Designing lesson plans/study scenarios</li> <li>Creating research instrument in the form of observation sheet</li> <li>Making Mind Mapping scoring rubric</li> <li>Preparing evaluation tool and authentic assessment</li> </ul>
<ul style="list-style-type: none"> <li>Action</li> <li>Observation</li> </ul>	Do	<ul style="list-style-type: none"> <li>Conducting activities as written in lesson plans</li> <li>Observing students</li> </ul>

		activities as the form of the researcher treatment during the learning process <ul style="list-style-type: none"> <li>Using research instrument to measure the achievement in each step of the activities:                             <ul style="list-style-type: none"> <li>Study achievement sheet of STAD and Mind Mapping</li> <li>Monitoring sheet for (Plan, Do, See) Lesson Study</li> <li>Observation sheet of students motivation</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>Reflection</li> </ul>	See	<ul style="list-style-type: none"> <li>Analyzing the observation result based on reflective discussion and collected instrument</li> <li>Offering feedback from the observer for lesson plan betterment and for further cycle improvement</li> </ul>

This study was conducted in Biology Education Department, University of Muhammadiyah Malang, Academic year 2013-2014, on odd semester, September-November 2013. The study subjects were students of B offering who were taking General Biology course in Biology Education Department at University of Muhammadiyah Malang academic year 2013-2014. The total participants were 42 students.

This study was a Classroom Action Research-Lesson Study that was conducted collaboratively. Cycle I consisted of two meetings and each meeting comprised *Plan, Do, See* stages. Cycle II consisted of two meetings and each meeting also comprised *Plan, Do, See* stages.

The data collection techniques were observation, motivation questionnaire, and concept comprehension scoring rubric.

The data analysis technique was a descriptive quantitative based on the available formula as below:

### ➤ Observation Analysis

The data from the observation were analyzed by describing the activities done during the lesson.

### ➤ Students' motivation questionnaire analysis

Students' motivation was measured by motivation questionnaire, where the scoring criteria involved:

Absolutely Agree

Agree

Disagree

Absolutely Disagree

The total score derived from the students in the scoring rubric for creative thinking would be converted in percentage, by applying the following formula:

$$\% \text{ motivation} = \frac{\sigma}{t_i} \times 100\%$$

- Concept Comprehension Scoring Analysis  
Students' concept comprehension was measured by essay test and mind mapping result; the following was the scoring criteria:

$$\frac{\% \text{ concept comprehension}}{\frac{T \ S \ p \ c \ +M \ m}{2}} \times 100\%$$

### 3 RESULT AND DISCUSSION

The CAR Lesson Study based activities were conducted in two cycles, cycle I and II, where each cycle consisted of two meetings. Cycle I was done in two meetings on Tuesday October 8 and 16, 2013. The main learning material was Bio-molecule and living creature characteristics.

On Tuesday October 8, 2013, the study was conducted in 3 x 50 minute period. In the first meeting, the introduction began with exploring the knowledge of human origin, about living bio-molecule through probing and staging questions. The lecturer played a video on biological molecular structure and function, and then he/she showed a picture on his/her PowerPoint slides about macro-molecular while asking “What is this picture about?”, “Why do scientists study macro-molecular?”

The lecturer asked students to sit in groups as many as 6 groups. He/she distributed the work sheet and asked students to conduct group discussion and to answer the problem in a mind mapping. During this activity, the lecturer observed the learning of each group and guided them in discussion part. When the group discussion and mind map drawing finished, they pasted the mind mapping on the white board. Afterwards, the lecturer chose one mind mapping which represented the most comprehensive concept to be discussed all together. The next phase was question and answer session among the groups based on the presentation. The following activity was a game in which students were asked to directly answer the questions delivered by the lecturer.

The lecturer provided conclusion for the given material and informed students the following week's material on making resume about living creatures. The observation result showed that students were quite able to follow the lesson, they were enthusiastic, and they were also highly motivated due to the use of game during the lesson. Students were able to study appropriately, however, some students sitting at the back row seemed to be busy while following the lesson stages; they still gossiped to each other. The predicted cause of the behavior was that students had covered the material before; therefore, one of the suitable efforts for the lecturer to overcome this problem was to give more strict instruction or warning so as students followed the activities more seriously. The lecturer should be able to control the class. Another point was that the use of

mind mapping could improve students' motivation to stay focus during the lesson. Time management should be considered by the lecturer as well.

In the second meeting, the class was conducted similar to the previous week that was to divide the class into groups, to discuss the material in groups, and to draw a mind map based on the discussion result. In the second meeting, students were identified to be more focused; only some groups did not stay focus. Students' motivation was increasing; students were used to making the mind map. The following description was the observation result from the second meeting: the ‘do’ activity had been conducted smoothly; students were motivated in following the lesson. It was proven by students' willingness to bring textbooks related to the lesson, their willingness to work in groups, and they were more focused on studying although some students did not fully fit the proper condition. By video broadcast and mind mapping, it was expected that students were helped in comprehending materials. In the beginning of the cycle, students might be less passionate due to the extra assignment loads from other subjects.

In cycle I reflection, students were highly motivated. This condition was correctly predicted since they were semester 1 students, so that their passion to join and participate in activities during the lesson was quite high already. Hence, the model lecturer should find a suitable assignment construct to give more motivation during apperception or whilst activities. In this stage, students' concept understanding was quite low but their creativity for mind mapping was excellent. Therefore, the solution for the model lecturer was to manage time allotment to give proper concept emphasis on the material. In order to comprehend the resume assignment concept, structured or outlined assignment points should be previously determined to keep the students' focus in understanding the concept. Students had enough courage to express their opinions, but they often felt in doubt and were afraid of making mistakes. It was a job for the model lecturer to motivate students to eliminate their doubt and improve confidence to state their opinions.

Cycle II of CAR-Lesson Study based was conducted in two meetings; they were on October 23 and 30, 2013. In the third meeting, apperception activity was to be the focus, so as to motivate the students. The writer also paid more attention to time allotment and game which was designed for the whole groups, not only for several groups. The model lecturer applied STAD combined with Lesson Study-based mind mapping.

In pre-activities, the lecturer greeted the students while asking if they were ready to start the lesson. Some students indicated their less readiness to receive material as they were busy doing some

assignments from other lecturers. The model lecturer kept on motivating students to follow the lesson. In the next step, the lecturer delivered materials and broadcasted a video as a–perception; the broadcasted video was about cell movements from various kinds of cells. The lecturer asked some questions, “What can you find from the video? What kinds of activities you notice? Explain the definition of cells based on your understanding related to the previous video”. It was expected that students answered all the questions thoroughly and the lecturer proceeded to explain the objective of today’s lesson.

The lecturer asked students to sit in groups as many as 6 groups and distributed the work sheet to each group. They started the discussion and drew their answers in mind mapping. During this period, the lecturer observed students’ work and guided students in discussion session. The group which finished the mind mapping might paste their work on the white board; the lecturer chose the most appropriate mind mapping and appointed the group to lead class discussion and question and answer session. Afterwards, students played game by answering some questions from the lecturer directly.

In the third meeting, students gained focus towards the materials, there was an increase in group work, they were enthusiastic to follow the lesson but there were some students who were still passive and lack of seriousness in designing a mind mapping. The predicted cause was the lack of class control from the lecturer; more strict treatment and distributive control should be performed by the lecturer. The reflection result from that meeting gave the writer plenty of lessons on the importance of motivation for students as well as the significance of time management in a course.

In the fourth meeting in cycle II, the material was about cell division. In this session, the lecturer paid more attention to students’ concept comprehension by presenting a video with appropriate time duration to avoid boredom. The result showed that students comprehended the concept more after the video broadcast and there was also an indication of creativity improvement.

The reflection result showed that apperception was required to motivate students to join the lesson and to assert the material concept.

Learning implementation reflection captured the achievement of STAD learning combined with mind mapping. The reflection proved that this combined teaching method could increase students’ motivation and their concept comprehension. The most highlighted point was to witness students’ self-improvement through the implementation of the combined method. This success could be achieved with the help of other lecturers as observers who always gave constructive suggestions and criticisms.

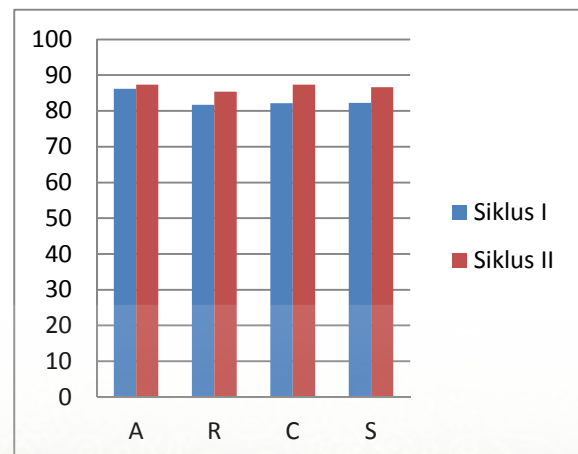
### 3.1 Students Learning Motivation

The data of students learning motivation was derived from learning motivation questionnaires that were designed based on motivation improvement strategy (ARCS model). The analysis was done by calculating the score of each aspect, and after the calculation, the scores were classified into five categories; very poor, poor, fair, good, very good. By the end of the calculation process, classical scoring classification was performed to find out classical score for holistic assessment of motivation. The questionnaire result after the treatment in cycle I and II for B class, Biology Education Department, University of Muhammadiyah Malang can be seen in Table 4.1. Tabel 4.1 The Mean Score of Motivation Aspect (%) per-cycle and its improvement for students of B class, Biology Education Department, University of Muhammadiyah Malang.

MotivationAspe cts	Cycle I	Cycle II	Improveme nt (%)
A	86.2	87.4	1.2
R	81.73	85.38	3.65
C	82.17	87.40	5.23
S	82.27	86.63	4.36
Categories	Verygo od	Verygo od	

Based on table 4.1, there was significant improvement for classical students’ motivation by the use of STAD model combined with mind mapping. The analysis result of students’ motivation questionnaires showed that, in every aspect, students’ motivation grew and increased, in line with the expected achievement set by the researcher. The expected achievement was a cooperative learning activity through STAD learning combined with mind mapping to increase students’ motivation in learning biology. The increase of students’ motivation can be drawn in a graph in Picture 4.3.

Graph 4.1 Students’ Motivation Improvement from Cycle I to Cycle II



### 3.2 Students Concept Comprehension Motivation

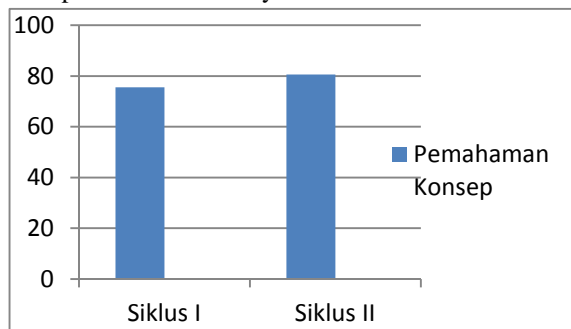
STAD learning combined with mind mapping could increase students learning result. This concept understanding can be derived from the test score in Cycle I and II

Tabel 4.2 Percentage Data of Students Concept Comprehension for B Class, Biology Education Department, University of Muhammadiyah Malang.

Objectives	Cycle I	Cycle II	Improvement (%)
Concept comprehension	75.5	80.6	5.1
Score conversion	B+	A	

Based on table 4.2, it was stated that the improvement percentage was 5.1 %; however, if it was converted into score, the improvement was significant especially for concept comprehension. The analysis result based on concept comprehension scoring rubric showed that the result was in line with the expectation of the researcher. Cooperative learning activities by the use of STAD learning combined with mind mapping would increase students' motivation in learning biology. The improvement of students' concept comprehension can be described in Graph in Picture 4.4.

Graph 4.2. The Improvement of Students' Concept Comprehension from Cycle I to II



### 4 CONCLUSION

1. Based on the implementation of STAD combined with mind mapping, there was an increase in students' learning motivation for B class, Biology Education Department, University of Muhammadiyah Malang with the following details: Attention improvement (1.2%), Relevance improvement (3.65%), Confidence improvement (5.23%), and Satisfaction improvement (4.36%).
2. Based on the implementation of STAD combined with Mind mapping, it was concluded that this

method could increase students' concept comprehension, especially for B class, Biology Education Department, University of Muhammadiyah Malang with the following details: Cycle I: 75.5, and Cycle II: 80.5; therefore, there was 5.1 increase in comprehension.

### 5 SUGGESTIONS

Based on the conducted research, several suggestions need to be proposed:

- For Lecturers
  - The implementation of STAD combined with mind mapping needs clearer instructions in order to be easily understood by the students for meeting the effectiveness purpose.
- For Students
  - Students should work in team and minimize individual work.
  - Students should submit the group work results on time.
  - Students should not feel shy and in doubt to ask questions if there is any information they do not understand during the activities.
- For Further Researchers
  - The implementation of STAD combined with mind mapping should be improved; in this study, only two cycles were performed by the researcher with a lot of changings in developing mind mapping; hence, it is recommended that lecturers or teachers be more creative in designing mind mapping.
  - If this combined method is implemented, it is better for the researcher to pay more attention to time management.

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## **Developing Eries Learning Model to Improve Students-Teacher Basic Teaching Skills Through The Implementation of Lesson Study**

(Research & Development on Teaching Learning Strategy Lecture in Indonesian Language and Literature Study Program, Faculty of Teacher Training and Educational Sciences, Pakuan University)

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**Abstract:** This study is aimed at developing ERIES learning model to improve semester V student-teacher's basic teaching skills in Teaching Learning Strategy lecture in Indonesian Language and Literature Study Program. Through the implementation of Lesson Study, ERIES model was developed by Exploration, Reflection, Interaction, Elaboration, and Summary steps. The method applied in the study is Research and Development and the approach used is qualitative and quantitative. Qualitative data were gained from needs analysis and response to the developed product, while quantitative data were gained from the test of the product and the effectiveness of the model. Research result shows that ERIES learning model is needed by student-teacher. Structurally this model is valid, relevant and fit the principles of learning model development both in its substance and its structure. Based on the try-out result from experimental research, ERIES learning model is effective to improve student-teacher's basic teaching skills. The achievement is better than non-ERIES learning model.

**Keywords:** learning model, basic teaching skills, ERIES model

### **1. INTRODUCTION**

#### **1.1 Background of the Study**

The implementation of Curriculum 2013 that focuses on the change orientation to active, creative, and innovative students center learning needs teacher's skill in facilitating the learning process. Learning will be productive if the lecturer is able to apply basic teaching skill such as opening and closing the lesson, delivering questions, explaining, reinforcing, and managing the class. These teaching skills can be gained through serious practice.

Teacher Education Institution has a task to produce skillful teachers in making effective learning. One of the activities given in the class is practicing the basic teaching skills in Teaching Learning Strategy subject. In this subject, one of the competencies that should be possessed by the students is applying basic teaching skill as the skill needed for practice teaching in real schools as a real teacher.

Based on the observation found in Teaching Learning Strategy subject, many students still have problems in practicing

the basic teaching skills. The problems are among other: they are shy to practice, they do not know what to say in front of the classroom, they do not know the aspects in each of the teaching skill that should be practiced, and they are careless in analysing basic competence and learning goal. It affects on difficulty to develop basic teaching skills. One of the ideas that the researcher will apply is developing learning model that is found through the implementation of lesson study.

Basically lesson study is one of the efforts to increase the teacher's quality and professionalism in facilitating the learning process. Lesson study is an activity that can develop a learning society which consistently and systematically do self development both individually and managerially.

It is hoped that through lesson study the researcher can develop a learning model which optimally can practice basic teaching skills for student-teacher in Teaching Learning Strategy subject.

Based on the description, it needs a design for lesson planning model. ERIES as a learning model through the implementation of lesson study is one of alternatives that can be applied by the student-teacher to develop basic teaching skills. Therefore, the researcher is interested in conducting the research and development for ERIES learning model to the 5th semester students of Indonesian Language and Literature study program of Faculty of Teacher Training and Educational Sciences of Pakuan University.

## 1.2 Research Focus

This research is focused on the development of ERIES learning model through the implementation of lesson study.

## 2. RESEARCH PROBLEM

Based on the background of the study and research focus, the researcher states the problem: “How to develop ERIES learning model in semester 5 of Indonesian Language and Literature study program of Faculty of Teacher Training and Educational Sciences through the implementation of Lesson Study?”

## 3. THEORETICAL FOUNDATION

### 3.1 The Nature of Model Development

Research and Development is a research method used to produce certain product and evaluate the effectiveness of the product. As stated by Gall and Borg that research and development in education is an industrial based development model in which the research finding is used to plan new product and procedure which then is tested in the field, evaluated and revised until until fulfilling certain criteria that is effective and qualified.<sup>1</sup>

Research and Development emphasizes on useful and beneficial product as a form of expansion, addition and innovation from the available product. To produce certain product, it needs research that focuses on need analysis, and to test the effectiveness of the product so it can function effectively. The product of education and learning can

be in the form of learning model development.

Model development is an effort to find a new formulation based on the principles and certain method to produce a new expected formulaion. The result of model development is an instructional system consisting of goal, material, learning strategy, learning media, and evaluation developed to achieve certain learning goal.

Besides, learning model development covers the steps of analyzing, designing, applying, and evaluating. The process of model development is an activity to revise the previous learning design or model to become a new model that can be applied in the learning process.

Learning model development is a systematic way in identifying, developing, and evaluating a set of materials and strategy led to achieve a certain education.<sup>2</sup> Learning model consists of a series of activities which include (1) planning, (2) developing, (3) evaluating learning system that is being developed so that after having several revision, the learning system can satisfy the learning developer. The product of learning model development is a learning system which consists of materials and teaching learning strategy developed empirically and consistently to achieve certain learning goal.

Learning model is a form or special character of learning activity done by the teacher from the beginning until the end. The learning form is something that shows thinking pattern as a whole connected concept.<sup>3</sup> It is called as thinking pattern because model can be defined as aseries of approach, strategy, method, thechnique, and unified and complete learning tactic.

According to Gustafson, model hels us conceptualize reality representation.<sup>4</sup> In

<sup>2</sup> Twelker, Paul A., Urbach, Floyd D., & Buck, James E. *The Systematic Development of Instruction* ( Stanford: ERIC Clearinghouse on Media and Technology, 1972), h.6.

<sup>3</sup> Benny A. Pribadi, *Model desain Sistem Pembelajaran*, (Jakarta:Dian rakyat, 2009),h.86

<sup>4</sup> Ken L. Gustafson and Robert Maribe Branch, *Survey of Instructional Development Model*. (Fourth Edition) (New York: Eric Clearinghouse on Information & Technology Syracuse, 2002), h. 1

<sup>1</sup> Meredith D. Gall, Joyce P. Gall, Walter R. Borg, *Educational Research: An Introduction*, (Boston: Longman, Pearson, 2003), h. 569



accordance with the reality, learning activity can be formed through various pattern or model which is caused by various condition and characteristics/conception of learning component. The conception starts from a specific thing such as formulating learning goal, developing learning material, choosing learning method and media and making evaluation, until the more common one such as education. Learning model is the conceptual framework that explains a systematic procedure in organizing learning experience to achieve certain learning goal and function as a guide for learning designer and teacher in planning the teaching learning activity.<sup>5</sup> Thus, model is a pattern that shows synergic activity of the components to achieve the learning result.

### 3.2 The Nature of Lesson Study

Lesson study is a model of educator profession development through analyzing learning collaboratively and continuously based on collegiality principles and mutual learning to develop learning community.<sup>6</sup> Lesson study leadership model can be used as teaching leading model for teacher or lecturer to their students and is an effort to improve the quality and teacher professionalism in facilitating the learning process.

Based on the explanation it is important to design text-based learning plan model for Bahasa Indonesia subject in implementing curriculum 2013. The lesson study based syntax learning design is one alternative model that can be used by teachers or student-teacher to improve the ability to plan a teaching learning activity.

According to Lewis if a teacher want to improve learning, he should collaborate with other teachers to plan, observe and reflect the learning that has been done.<sup>7</sup>

Therefore, lesson study is done in three stages: plan, do, see. The three stages are done continuously. In other words lesson study is a way to improve the quality of education that never ends (continuous improvement)

The improvement of teacher professionalism is bottom-up because the learning development is done by considering suggestion, critique and advice from observers that are analyzed collaboratively and continuously.

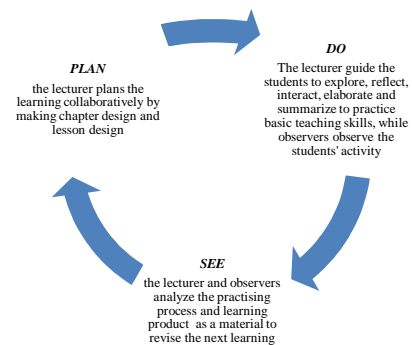
The pattern of lesson study learning that is developed is shown in the following picture:

In implementing lesson study based learning, in do activity, observing by some observers, the students explore various learning video enthusiastically.

### 4. RESEARCH METHOD

This research applies research and development method and done to the 5th semester students of Indonesian language and Literature study program in Teaching Learning Strategy subject.

The development of this learning model is based on the analysis of document, observation, and learning process. The



research is started by need analysis that consists of document analysis and learning process analysis. The instrument used in this research is observation and questionnaire that has been discussed with experts and the target is providing information about learning components

[guide to lesson study](http://www.lessonresearch.net/briefguide.pdf). Philadelphia: Research for better schools. Online. [www.lessonresearch.net/briefguide.pdf](http://www.lessonresearch.net/briefguide.pdf).

<sup>5</sup> Trianto, *Model-model Pembelajaran Inovatif Berorientasi Konstruktivistik*, (Surabaya: Prestasi Pustaka Publisher, 2007), h. 5.

<sup>6</sup> Hendayana, Sumar., dkk. *Studi peran IMSTEP dalam penguatan program pendidikan guru MIPA di Indonesia*. (Educationist. 2007, Vol 1 (1)) hh 28-38.

<sup>7</sup> Lewis, C. 2002a. [Lesson study: A handbook for teacher-led improvement of instruction \(Brief](#)

with the characteristic of needed learning model. Then synthesizing information about the need of basic teaching skills. The product is the list of basic teaching skills components, need analysis instrument, the characteristic of model used, perception about the available model and the model that will be developed.

## 5. RESEARCH RESULT AND DISCUSSION

### 5.1 Description of Plan, Do, See in each cycle

After doing the step of research and development started from need analysis, development, and implementation, the lesson study based learning planning model is considered to be finished. This learning model is called lesson study based ERIES learning model.

In implementing lesson study, ERIES learning model is planned integratedly through plan, do, see. During the plan, the lecturer model team formulate chapter design and lesson design. The plan stage is developed after the second, third, and fourth cycle. In do stage the learning activity through ERIES can be seen because ERIES is born from dominant activity that are often done by the students, but there is no name for it. This continuously develops from cycle to cycle. Based on the observation, this learning activity develops in the second, third, and fourth cycle. The students show the mental involvement in doing the activities such as to explore, reflect, interact, elaborate, and summarize in practicing basic teaching skills. The learning documents such as chapter design and lesson design is revised, and suggestion given during the see after the class ends is directly done. It is done to solve the problems found in the class. All observers give feed back based on their observation. The result of see is a new lesson design as the revised learning plan to be done in the next cycle.

Based on the research finding, ERIES is a learning model that is properly developed based on the indicator used. Expert evaluation result shows proper learning model to be used in Teaching Learning Strategy subject. Lesson study based ERIES learning model has been tried out and has fulfilled all model component stated by experts. Lesson study based ERIES learning model has been validated

and has followed a series of continuous research activity process to get the valid final product.

The learning is started by pretest and ended by post test. After fulfilling the t-test with the result of normal test result and homogenous data, it shows that the pretest and the posttest are significantly different. It indicates that lesson study based ERIES learning model is effective to improve the students' average score to practice basic teaching skills.

It can be concluded that the effective test result of learning model with experiment and control group. The analysis of t-test shows that lesson study based ERIES to the 5th semester students of Indonesian Language and Literature study program is effective and suitable to be used as a learning model in Teaching Learning Strategy subject.

The finding is based on observation result, the class with lesson study makes the students to be active and become independent learner to practice teaching. The class with lesson study is a new experience for them, in which they enjoy learning and feel satisfied in doing the learning activity. They are mentally involved actively to explore, reflect, interact, elaborate, and summarize in doing the task. Lesson study based ERIES learning model gives a new experience for the students.

The following table is the lesson study based ERIES learning model:

Table 1. Lesson study based ERIES learning model design

Lesson Study	Model Stage	Lecturer's activities	Students' activities
<b>Plan</b>	The lecturer collaboratively plans chapter design and lesson design	<ul style="list-style-type: none"> <li>• Material orientation</li> <li>• Material exploration and elaboration</li> <li>• Planning TLA through ERIES model</li> <li>• Providing learning video</li> </ul>	<ul style="list-style-type: none"> <li>• Reading lesson design written by the lecturer</li> <li>• Reading various references</li> </ul>
<b>Do</b>	➤ <b>Eksplorasi</b>	<ul style="list-style-type: none"> <li>• showing learning video related to basic teaching skills that should be mastered by the students.</li> <li>• Guiding the students who find difficulties in finding aspect/components basic teaching skills based on their observation</li> </ul>	<ul style="list-style-type: none"> <li>• Exploring the components of basic teaching skills from the video</li> </ul>
	➤ <b>Reflection</b>	<ul style="list-style-type: none"> <li>• Guiding the students to do reflection</li> </ul>	<ul style="list-style-type: none"> <li>• Reflecting various components of basic teaching skills they found</li> <li>• Associating the video with the schemata related to the learning process.</li> <li>• Explaining the components of basic teaching skills from the video they watch.</li> </ul>
	➤ <b>Interaction</b>	<ul style="list-style-type: none"> <li>• Organizing the students to discuss and interact to each other</li> </ul>	<ul style="list-style-type: none"> <li>• Interacting with their team mates related to the components of basic teaching skills</li> <li>• Discussing and jotting down important information related to basic teaching skills.</li> </ul>
	➤ <b>Elaborasi</b>	<ul style="list-style-type: none"> <li>• Guiding the students to practice basic teaching skills</li> </ul>	<ul style="list-style-type: none"> <li>• Explaining the components of basic teaching skills they found.</li> <li>• Practicing the aspects of basic teaching skills in front of the classroom</li> <li>• Observing other students and taking notes about their friends who practice the basic teaching skills</li> <li>• The lecturer helps the students who have problem to practice basic teaching skills.</li> </ul>
	➤ <b>Summarize</b>	<ul style="list-style-type: none"> <li>• The students get the reinforcement about basic teaching skills they need as a teacher</li> </ul>	<ul style="list-style-type: none"> <li>• The students make a summary and take notes about feedback upon the basic teaching skills practice</li> </ul>
<b>See</b>	<ul style="list-style-type: none"> <li>• The lecturer, the observers and the students reflect to analyze the weakness of the learning process and teaching practice; revising the mistakes for a better learning in the future. It produces revision design in the see stage covering the learning tools, learning stages, and evaluation.</li> </ul>		

## 6 CONCLUSION

ERIES model is developed through the implementation of lesson study in this research is a conceptual framework that consist of propostions as a guideline for the student-teacher to practice basic teaching skills, which cover opening and closing the lesson, explaining, asking, reinforcing, and managing the class. ERIES stage in do focuses on learning activity upon students' activities. By applying ERIES learning in Teaching Learning Strategy it is expected to produce the student-teacher who are able to create teaching learning process that produces the students who are active, creative, and innovative. The government's expectation to create smart, outstanding, and competitive students might be achieved.

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# The Use Of Silent Way Method And Cooperative Learning In Optimizing Lesson Study By Utilizing Plain Media As Learning Innovation

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**Abstract:** Such the development of technology, it does not mean to back up our daily activity, this is also the activity in learning process. Due to insufficient of budget to cause the facilities needed. But, it cannot be considered as a reason to make not innovation by utilizing media around us. The utilizing plain media constitutes one of important thing and does support learning process which make comfortable activity if joined appropriate method and technique with characteristic of lesson or subject. The writer aims at conveying the importance of a lecturer or teacher to be innovation in learning to make comfortable process in learning activity. This thing is important to be done in order to make the students enjoy the learning activity, if the lecturer or teacher uses one method repeatedly and no innovation, the students will get boring to join the activity. Lesson Study was done by using Silent Way method and Cooperative Learning. These methods chosen because in its implementation, one emphasized thing is the use of media as the mean of learning. While cooperative is an approach or method which how the students are cooperative to discuss among them in group also with the lecturer or teacher. By the analysis of the reflection journal (instrument) during four cycles of the lesson study, it shown that the implementation of lesson study by utilizing plain media and combined that methods made the interesting and comfortable for the learning activity.

**Keywords:** lesson study, silent way, plain media, innovation

## 1 INTRODUCTION

### 1.1 Background

In the effort to improve the quality of education at the university and at school, the government has a lot of money to support all government programs that are related to the process of improving the quality of education. However, the reality is so great that the education budget has not been able to make even improve the quality of education that happens is a lot of educational institutions are unkempt and broken because it did not have sufficient treatment costs. On the other hand, the policy makers who manage the budget could not be trusted that there is abuse of authority to enrich them through corruption of the education budget. Efforts to improve the quality of school education and university level in order to be good, in fact did not perform as expected due to mismanagement of the budget.

Along with the development of technology, a teacher or a lecturer is required to always innovate to create a learning process that is not boring in this case fun learning. The point is a teacher or lecturer should creatively make learning which students

become interested, feel enjoy by using media, whether it is the media that are categorized high-tech or simple media all around us (around the school / college, tourism objects, classroom model, and so on). But sometimes some of us insist that the best learning innovation is high tech. Though, it does not guarantee the quality of learning for the better if we use it only as a means of facilitating our work. If we teach in remote areas that do not have a category of high tech facilities, we will have difficulty in developing learning media if we do not take advantage of other media that is still simple.

Therefore, the problem of lack of education budget and the lack of high-tech media, should not be the reason for educators both teachers and lecturers not to innovate in order to improve the quality of learning through learning innovation. Through innovations that made towards learning, is expected to give additional value in terms of improving the quality of education.

### 1.2 Identification of the Problem

From the description on the background above, it can be found a few things that the reason for the lack

of innovation and learning done by teachers and lecturers and it is not interesting learning process for students, which is actually two things is an important issue in order to improve the quality of learning, which is one factor important of increasing the quality of education. Those things are:

- a. The lack of government support through education budget.
- b. Educational budget corrupted by educational stakeholders.
- c. Inadequate means of learning (no high tech).
- d. Lack of simple media using around us as an innovative learning.
- e. The students are not interested in the learning process.

It must be admitted that the lack of government support and uneven in terms of the education budget. Because first and foremost factor in improving the quality of education is a considerable cost to prepare a complete tool for improving the quality of education through innovative learning with a variety of processes. Besides corruption, the distribution of the educational budget is also uneven so many areas far from urban areas often do not get help from government. In the absence of government support through the education budget, then there would be no increase in the quality of learning for the better. So, if teachers and lecturers are not creative in going around the lack of those facilities, it is certain that the quality of learning will not get progress.

### 1.3 Scope of the Problem

Based on the identification of the problem above, the researcher only focuses on the last two points, namely "Lack of Simple Media Utilization around Us and Students Are Not Interested Existing Learning". For readers, these two points might be considered unimportant, but from the perspective of researcher, the use of simple media is a very supportive learning tool, which can make learning becomes fun and not boring if joined by appropriate methods and techniques as the character of the subject. Another reason which makes researcher paid attention to this issue is because it is still in the active period of the course so that the time available has not been possible to do research outside, thus, also the unavailability of cost so the researcher decided to do a research through lesson study.

### 1.4 Formulation of the Problem

The exposure to background problems, and identify and then limitation the problems mentioned above, can be raised formulation of the problem as follow:

1. Do the silent way method and cooperative learning make learning interesting by using plain media?

On learning that has been done before, with question and answer technique, most of the students are very passive because just listening without responding to what is described. Therefore, the researcher, in this case as well as a lecturer on the implementation of model of lesson study makes learning design by utilizing a simple media (carton paper). Simple media is chosen, because not always the category of high tech media able to facilitate the learning process, even though IT-based media if not creative lecturer or teacher still learning to innovate will not be interesting. That is why; the researcher tries to use this simple media as innovations to improve the quality of learning by silent way and cooperative learning method.

## 1.5 Library Review

Related research has ever done before is "Lecturer Professional Development Through Lesson Study Implementation" which describes some of the reasons why the lesson study must be developed in college (Nahjiah and Gay, 2012: 14-15), including:

- a. Lesson study is an effective way to improve quality of learning.
- b. Lesson Study will produce a professional and innovative lecturer.
- c. Improve collaboration among educators in learning.
- d. Improving writing skills scientific papers or textbooks.

Learning innovation is a renewal on various aspects of learning so that learning becomes more optimal. Various aspects of learning can be the target of reform, among others; instructional media, methods and learning method (Sailah, 2012: 10).

Silent way based on the premise that the teacher should be silent as much as possible in the classroom but the learner should be encouraged to produce as much language as possible. Silent way shares a great deal with other learning theories and educational Philosophies. In a silent way, Gattegno's work could be stated as follow: (1) learning is facilitated if the learner discovers or creates rather than remembers and repeats what is to be learned. (2) Learning is facilitated by accompanying (mediating) physical objects. (3) Learning is facilitated by problem solving involving the material to be learned (Richard and Rodgers, 2001: 81).

The goal of teachers who use silent way is that

students should be Able to use the language for self-expression-to express Reviews their thought, perceptions, and feelings. In order to do this, they need to develop independence from the teacher, to develop Reviews their own inner criteria for correctness. Students Become Independent by relying on themselves. The teacher, therefore, should give them only what they absolutely need to promote Reviews their learning (Freeman, 2000: 64).

Cooperative learning is an approach to teaching that makes maximum use of cooperative activities involving pairs and small groups of learners in the classroom (Richard and Rodgers, 2001: 192).

Cooperative learning refers to a wide variety of teaching methods in which students work in small groups to help one other in learning the subject matter. In the cooperative classroom, students are expected to help one another, discuss and argue with others to hone the knowledge that they control the time and closes gaps in understanding each (Slavin, 2008: 4).

Cooperative or collaborative learning essentially involves learning from each other students in groups. But it is not the group configuration that makes cooperative learning distinctive; it is the way that students and teachers work together that is important. In cooperative learning, teachers teach students collaborative or social skills so that they can work together more effectively (Freeman, 2000: 164).

### 1.6 Objective

In this paper, the writer wants to communicate the importance of a lecturer or teacher do learning innovation so that the learning process is not boring. This is important thing to be done because the students must feel bored if we only rely on one method repeatedly. Conventional method (preach and question-answer), for example, if we use constantly, students definitely get lazy and passive to the learning process that we are going to do. Therefore, the writer conducted a study of innovation by using a simple media in the form of carton paper design as a student worksheet. The writer uses this as a simple media, exciting learning tool that should not be categorized as a high-tech, but with a few simple instruments can make learning enjoyable stay as long as lecturers and teachers are always willing to innovate.

## 2 METHOD

Lesson study is done by using a silent way and cooperative learning, silent way chosen because this method one of which emphasizes the use of media as a learning tool. Cooperative learning is a method how the students to cooperate among them to form groups also with a teacher or lecturer in a learning process.

Subjects were used as sources of data in this lesson study are the fifth semester students of English language program of Muhammadiyah University of North Maluku was 22 people. The numbers of cycles in the implementation of lesson study are four cycles.

The instrument was used in this study was the students' reflection journal. Data collection technique was done after the lesson study finished the lecturer/ researcher provided reflection journal sheet to be filled. On reflection journal, there were three questions for students to answer, which of the three questions it will be known whether the methods and techniques used effectively or not. Three forms of inquiry submitted; 1. What do you think about the learning process today? 2. Do you understand the lesson today? 3. What are the things that you have not understood the lesson today? Reflection journal division performed every cycle.

Data were analyzed by using categorization, in which this is done by matching the students' answers to a theme / topic at each cycle.

## 3 RESULTS AND DISCUSSIONS

The first cycle was conducted on 27 November 2013 at 10.00 to 11.30, performed at dean's room. The *Plan* step, the modeling lecturer was Amrin Hi. Saban, SS, M.Pd.BI and the moderator was Syamsudim Hi. Adam, SS,M.Pd and consisted of seven observers. At this stage, the lecturer gave a brief overview of the material that would be discussed in class that "the function of literature as education and amusement". At the stage *Do*, activity began with an explanation of the steps to be taken by the students to the student worksheet that had been given. At the opening of this first cycle there were some students who seemed confused because the first lessons study for them. At the time of the core activities, the students were divided into five groups, each group consisted of four to five people. Each group had been given a handout material and ten minutes to discuss. After that, each group was represented by its chairman came forward to present the results of the discussion in accordance with the

instructions contained in the students' worksheet. At the end of the activity, the students seemed so excited when finished presenting the results of their discussion. At the stage of *See*, after the observation made by the observers, seemed that there some students who were not active, did not understand the explanation, and the explanation was still confused for the students. This could be known from the notes of the observer for students who need to be considered by the modeling lecturer including: (1). Students need more detail explanations about what to do. (2). Students need to be visited during the discussion to ask if they already know or not. (3). they need to be given an example that has to do with the material to be discussed.

The second cycle was conducted on 28 November 2013 at 11:00 to 12:00 with six observers. The *Plan* carried out in the faculty room, where the lecturer briefly described the model of the material that would be given to students was about the "early modern English literature". In this theme the students are asked to find out the model of education during the early modern English literature consisting of three levels, namely; vernacular elementary school, grammar school, and universities. At the stage *Do* began with greetings, asking the student condition, followed by instructions on what to do in this second lesson study refer to the handout that had been given. Then, in the main activities of the students are asked to discover important facts about education in three levels (elementary vernacular school, grammar school, and universities), then wrote it on students' worksheet which had been provided, then present it. Chairman of the group represented her/his friends presented the results of their findings as in the first cycle. At the end of the activity, the lecturer gave reinforcement and concluded it with a reinforcement material that had been discussed.

The third meeting was held on 4 December 2013 with seven observers from 10.00 to 11.30 ran well, and the topic was "the elements of literature (character, plot, point of view)." On stage *Plan*, modeling lecturer gave little bit explanation of the learning process would be performed by the students later. Where in this cycle, the modeling lecturer was using students' worksheet form of carton paper that contains a table of the elements of literary stories that had been written and the students were asked to choose keywords which given and matched. At the stage *Do*, the modeling lecturer gave some idea about the steps to be taken by students with carton paper and boxes that contain that keyword. Then the students were asked to take a box containing the

keywords in accordance with the group. Students took an existing piece boxed keywords then discussed together and identify compatibility. Students seemed happy with this method. This could be seen from their enthusiasm to perform matching between elements of literary elements with key words. At the stage *See*, there some students who were still confused with the pre-activities to be carried out, after seeing other friends began steps then they became understanding of the activities. It seemed that some students need to be given a detail explanation gradually in order to help them easy to understand. The friends in the group must always help to explain to their friends who do not understand yet. Students need to be given an assessment of their results so that it motivates them to be more active in the learning process was done. Finally, color paperboard used to make tables should contrast with the color paperboard used for writing key words to make it looked attractive.

The fourth cycle was conducted on 5 December 2013 the number of observers to eight people and is still the connection of the third cycle. So the fourth cycle theme is still about elements of literature story (setting, conflict, theme, and ending)." At the *Plan* was done in the faculty room, modeling lecturer briefed that the activity students still like the third cycle but keywords that had been placed in an open box is replaced with a sealed envelope. At the stage *Do*, lecturer provided direction what should be done by the students. Then each group moved forward to take keywords but might not be ripped. Then students were given five minutes to read the handout materials related to the elements of literary stories. After the material was closed back and opened the envelope to take the key words. They were given three minutes to identify the key words. After that every person from each group moved ahead by bringing a keyword and matched with table cardboard taped to the whiteboard by means stick with glue. At the stage of *See*, the observers noted there still some students who were confused when modelling lecturer gave explanation of pre-activity about what to do, others than that there any student was sleepy and unspirit. But in general, the students were so enthusiastic to follow to the end, and they were very interested in learning method used by modelling lecturer. By the all cycles, it can be concluded that the atmosphere of the rooms were comfortable and also the good time make the students to be active or not in following the learning process. (see the tables and photos in Appendix)

In the first cycle with the topic "function of literature", the presences of 19 students from 22



students were active. In this phase, the model lecturer asked the students to identify the function of literature in the world of education and entertainment. Students were asked to complete worksheets that had been provided with submitted instruction. Then each group represented by one person came forward to present their identification. Once completed, the lecturer provided reflection journal sheet to request a response from the learning methods and techniques used in the first cycle. Upon reflection journal retrieved and analyzed can be found answers consisting of; twelve people answered "interesting and understand", and seven people answered "less of interesting and do not understand."

In the second cycle, the discussed topic was the "Early Modern English Literature." In this second cycle, the lecturer chose the media also still like the first cycle was LKS. In this phase, students were asked to identify any problems that were on the three levels of education in Early Modern English Literature. Three levels it is; Vernacular Elementary School, Grammar School, and Universities. After the learning process that began with the *Plan, Do, and See*, and then continued to give the student journal reflections were taken and analyzed, the results showed that; of the 15 students in attendance, 11 people answered "interesting and understand" while 4 people answered "less attractive and do not understand."

In the third cycle, the theme is "Elements of Literature" (character, plot, and point of view). In this third cycle, lecturer was using simple media namely five carton papers as the students' worksheet according to the number of groups. In paperboard was made table of the elements of literature and then students were asked to match the key words that had been provided in the column corresponding to the given instructions. Previously, lecturer gave five minutes to each group to discuss the key words in connection with literary elements and then they put it on the table according to the columns that were considered compatible with the selected keywords. After all the keywords attached conformed to the fit, then counted how many keywords are correct according to the literary elements of the existing columns. In this phase the obvious enthusiasm was so high that students vying tried expeditiously as possible to match the keywords in each column are available. After completion of the learning process, model lecturer provided a journal reflection to be filled to request students' feedback about the methods used in this third cycle. After analyzing, it was found as the result of the second cycle, that of

the 15 people present there are 11 people answered "interesting and understand" and 4 people answered "less attractive and do not understand."

In the fourth cycle, both the theme and the media used remain the same as third cycle but different focus; setting, conflict, theme, ending, as well as the methods and techniques of implementation of the same, in which students were asked to discuss five minutes of key words and then match the literary elements in table columns that exist in the media (paper carton). After completion of the learning process, students were given a journal reflection to give feedback on learning in this fourth cycle. From the review of the student journal in the fourth cycle, the result that; of student attendance 15 people, found 13 people answered "interesting and understand" and 2 answered "boring and less understood."

Discussion of the results described above demonstrates that the use of a silent way by utilizing a simple media (paper carton) shown a very significant increase in interested in the learning process was done. Thus it could be said that "the students were very interested in the silent way method used in the learning process."

## 4 CONCLUSIONS AND SUGGESTIONS

### 4.1 Conclusion

In accordance with the results of the analysis contained in the points table discussion on the above it can be concluded that in one cycle, of the 19 people present there were twelve students said that interested in learning process that takes place and seven students are less / not interested in the methods was used. In the second cycle, the presence of students decreased by 15, but interested in the learning process remains stable, at 11 people said are interested in these methods, so the decline in the number of student attendance is not followed by a decline in the interest of students in the learning process. In the third cycle, the result remains the same as the second cycle that students who attend in 15, 11 students expressed very interesting learning and 4 students say less attractive. In the last or fourth cycle, the number of student attendance remains of 15 people, but an increase in interest in the very means that 13 people say very interesting learning while only two people who say that the learning process is very tedious.

## 4.2 Suggestion

Based on these conclusions, the writer have some suggestions that may be considered by the organizers or the person in charge of lesson study, namely, about the time of the implementation of lesson study would not set a schedule during the daytime, because it can affect the enthusiasm of students to participate in the learning process (lesson study). The reason there are students that when given a reflective journal for responding to questions even answer is not in accordance with the questions but the answers like "hungry, sleepy, tired, and others." And the implementation time of lesson study set out during the daytime also affects the amount of students' attendant, is evident from the first cycle of the presence of 19 people decreased to 15 people in the second cycle, third, and fourth. Next for the observer so that the learning process (lesson study) took place, hopefully the observers not always in-out because it is very disturbing concentration of lesson study participants. Finally for all the organizers of the implementation of lesson study, both modeling lecturer, observer, or the stakeholder expected to continue to support the responsible implementation of lesson study because it proved very effective in improving the understanding of students in the learning process and of course very enjoyable.

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APPENDIX 1

Table 1. Cycle One

Topic : Function of Literature (Education and Amusement)

No	Students Name	What do you think about the learning process today?			Do you understand with the lesson today?			What things that you have not understand?			Exp.
		M	K M	M b	Men	K Men	TMen	M et.	Tek.	Penj.	
1	Almudariq Mas'ud	✓			✓						
2	Bambang Hi. Ibrahim	✓			✓						
3	Zulfa I. Badarudin	✓			✓						
4	Humaidi M.S. Yoba	✓			✓						
5	Amanda Pratiwi S.		✓				✓		✓		
6	Nasarudin A. Gafur	✓			✓						
7	Rismawati A. Rahman	✓			✓						
8	Eka S. Marasabessy	✓			✓						
9	Fahima Salim		✓				✓			✓	
10	Ferdianti Suprpto	✓			✓						
11	Mega Abjan		✓				✓		✓		
12	Nursafat Mahmud										TH
13	Sumarni Muhammad										TH
14	Surtilla Soleman	✓			✓						
15	Rusman	✓			✓						
16	Endang Puspasari	✓			✓						
17	Rosita Yusup		✓			✓			✓		
18	Runi Muhammad		✓			✓			✓		
19	Sufiyanti Yasin	✓			✓						
20	Sahria Samman										TH
21	Sutriyani		✓			✓				✓	

	Muhammad									
22	Djaitun A. Rahman		✓			✓		✓		

Description:

M: Interesting

KM: less interesting

Mb: boring

Men. : understand

Kmen: Less Understand

Tmen. : Not Understand

Mt. Methods

Tech: technique

Desc. : Description

TH: not present

I: permission



LKS models used in the first cycle can be seen below:

Figure 1. LKS First Cycle

No	Function of Literature			
	Educate	Examples	Amuse	Examples
1				
2				
3				
4				
5				

APPENDIX 2

Table 2. Cycle Two

Topic : Early Modern English Literature

No	Students Name	What do you think about the learning process today?			Do you understand with the lesson today?			What things that you have not understand			Exp
		M	K M	M b	Men.	K Men.	T Men.	Mt.	Te k.	Penj.	
1	Almudariq Mas'ud	✓			✓						
2	Bambang Hi. Ibrahim	✓			✓						
3	Zulfa I. Badarudin		✓				✓			✓	
4	Humaidi M.S. Yoba										I
5	Amanda Pratiwi S.										TH
6	Nasarudin A. Gafur	✓			✓						
7	Rismawati A.Rahman	✓			✓						
8	Eka S. Marasabessy	✓			✓						
9	Fahima Salim										TH
10	Ferdianti Suprpto	✓			✓						
11	Mega Abjan	✓			✓						
12	Nursafat Mahmud										TH
13	Sumarni Muhammad										TH
14	Surtilla Soleman	✓			✓						
15	Rusman	✓			✓						
16	Endang Puspasari	✓			✓						
17	Rosita Yusup		✓				✓			✓	
18	Runi Muhammad	✓			✓						
19	Sufiyanti Yasin		✓				✓			✓	
20	Sahria Samman										TH
21	Sutriyani Muhammad		✓				✓			✓	
22	Djaitun A. Rahman										TH

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Documentation (photographs): second cycle



Model LKS it can be seen in the image below.

Figure 2. Second Cycle Worksheet

o	The students have to find out the main points of education in:		
	Vernacular Elementary School	Grammar School	Universities
Conclusion:			



APPENDIX 3

Table 3. Cycle Three

Topic : Elements of Literature Story (character, plot, dan point of view)

No	Students Name	What do you think about the learning process today?			Do you understand with the lesson today?			What things that you have not understand			Exp.
		M	K M	Mb	Men.	K Men.	TMen	Mt	Tek.	Penj.	
1	Almudariq Mas'ud	✓			✓						
2	Bambang Hi. Ibrahim	✓			✓						
3	Zulfa I. Badarudin	✓			✓						
4	Humaidi M.S. Yoba										I
5	Amanda Pratiwi S.										TH
6	Nasarudin A. Gafur	✓			✓						
7	Rismawati A. Rahman	✓			✓						
8	Eka S. Marasabessy	✓			✓						
9	Fahima Salim										TH
10	Ferdianti Suprpto	✓			✓						
11	Mega Abjan	✓			✓						
12	Nursafat Mahmud										TH
13	Sumarni Muhammad										TH
14	Surtilla Soleman		✓				✓			✓	
15	Rusman	✓			✓						
16	Endang Puspasari	✓			✓						
17	Rosita Yusup		✓				✓			✓	
18	Runi Muhammad		✓			✓			✓		
19	Sufiyanti Yasin	✓			✓						
20	Sahria Samman										TH
21	Sutriyani Muhammad		✓			✓				✓	
22	Djaitun A. Rahman										TH

Description:

M: Interesting

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Men. : understand

Kmen: Less Understand

Tmen. : Not Understand

Mt. Methods

Tech: technique

Desc. : Description

TH: not present

I: permission

Documentation (photographs) third cycle



Duplication table form in paper carton can be seen in the image below:

Figure 3. Form LKS third cycle

o	Students have to find the key words and then match to its elements			
	Elements of Literature story	Key words	Assessment	
			True	False
	Character			
	Plot			
	Point of View			

APPENDIX 4

Table 4. Cycle Four

Topic : Elements of Literature Story (setting, conflict, theme, and ending)

No	Students Name	What do you think about the learning process today?			Do you understand with the lesson today?			What things that you have not understand			Exp.
		M	K M	Mb.	Men.	K Men.	T Men	Mt.	Tek.	Penj.	
1	Almudariq Mas'ud	✓			✓						
2	Bambang Hi. Ibrahim	✓			✓						
3	Zulfa I. Badarudin			✓		✓				✓	
4	Humaidi M.S. Yoba										I
5	Amanda Pratiwi S.										TH
6	Nasarudin A. Gafur	✓			✓						
7	Rismawati A. Rahman	✓			✓						
8	Eka S. Marasabessy	✓			✓						
9	Fahima Salim										TH
10	Ferdianti Suprpto	✓			✓						
11	Mega Abjan	✓			✓						
12	Nursafat Mahmud										TH
13	Sumarni Muhammad										TH
14	Surtilla Soleman	✓			✓						
15	Rusman	✓			✓						
16	Endang Puspasari	✓			✓						
17	Rosita Yusup	✓			✓						
18	Runi Muhammad	✓			✓						
19	Sufiyanti Yasin			✓		✓				✓	
20	Sahria Samman										TH
21	Sutriyani Muhammad	✓			✓						
22	Djaitun A. Rahman										TH

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Tmen. : Not Understand

Mt. Methods

Tech: technique

Desc. : Description

TH: not present

I: permission

Documentation (photographs) four cycles



Duplication table with cardboard paper media can be seen in the image below.

Figure 4. Students' worksheet of fourth cycle

No	Students have to find the key words and then match to its elements			
	Elements of Literature story	Key words	Assessment	
			True	False
1	Setting			
2	Conflict			
3	Theme			
4	Ending			

## An Investigation to Novice English Teachers' Self-Consideration Upon Their Decision of Joining Teacher Study Group: A Case Study in Bandar Lampung, Indonesia

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**Abstract:** Personality traits and personal reference of three NETs are observed through in-depth interview, participants' account through individual log book, and observation during initial group sessions. The result of the investigation signifies that introverts have more or less equal possibility to join group with the extroverts. In spite of suggestion that extroverts are likely to succeed a group work, this finding offers different idea. Personal reference that does not support their participation in TSG does not instantly drive NETs to decide to not joining TSG. On the contrary, they take the challenge and participate voluntarily.

**Keywords:** Personality, Past Experience, Self-Directedness, Andragogy

### 1. INTRODUCTION

This is an initial report of investigation to Novice English Teachers (NETs)' participation in a small group discussion termed as Teacher Study Group (TSG) as a professional development activity. The foci of the study is to observe NETs knowledge, or cognitive aspects, when it is utilized, generated, and formulated (or even reformulated) during a voluntary sessions in a study group. The knowledge obtained and possessed by NETs is in the form of concepts, principles, and theories from pre-service education. However, when it is applied in teaching practice, those types of knowledge are reformulated and rearticulated in the form of actions such as instructions, material selection, and strategies of assessment. To articulate appropriate forms of knowledge in particular occasion of teaching, NETs have to be fully aware of what they do. Only then can NETs be addressed as teachers who have understanding on their subjects (Cochran-Smith & Lytle, 1999; Darling-Hammond & Bransford, 2005).

The understanding on subject matter cannot be realized unless NETs process concepts and theories in an active way of adult learning or education (Cole, 1996) (Freeman, 2001). It cannot be denied that inside the in-service period or working period lies down an excellent opportunity for them to keep developing their knowledge. This is based on the assumption that knowledge develops and evolves during human life time as they keep interacting with their societies (Cole, 1996). With this perspective bear in mind, NETs have to develop their knowledge and they still have plenty of time to do it. Also, this is interpreted that NETs just begin their quest on a long journey toward their expertise and they need learning experience or education both formal and informal during the proces (Craft, 2000).

Discussing about learning experience or opportunity for developing their selves, there are many forms of in-service professional development programs that can be offered (Richards & Farrell, 2005). From different programs, study group is selected as it provides safe environment for teachers to speak, offers continuous effort for teacher development, and obliges collaboration from diverse members from different background and capacities. Different member backgrounds allows peers and more knowledgeable others (person) share knowledge and understanding (Johnson, 2009) (Hargreaves, 1994) (Kooy, 2006) (Lantolf, 2000).

### 2. DISCUSSION

In forming the study group, the researcher set several criteria for the member of the group selection. The participants are particular individuals who in the time of study currently (Yin, 2003) have:

- a. Teach English in Bandarlampung area to narrow the geographical area into a city where access of information is nearly adequate.
- b. Bachelor degree from English Education Department or English Literature with additional education training certificate (AKTA IV) because only the NETs with this qualification have studied both content (English language) and pedagogy.
- c. Never or rarely join any professional development program in or out of their workplace.
- d. Their schools supply minimum or no support for professional development
- e. Teaching in junior high schools, considering that in junior high the teaching of English starts to be obliged. The researcher assumes that the types of understanding they will develop is the basic and the easiest one.

- f. Just begin teaching after graduation up to 5 years in teaching because age is an important factor for the study. The study expects fresh graduate, young adult NETs will join the group.
- g. Teach seventh or eighth graders to limit the curricular aspects which will be discussed in the group
- h. They are willing to participate. This is important to show their willingness to learn
- i. They bring recommendation from the principal, this is part of ethical consideration and to indicate cooperative attitude from administrator of each NETs school

Fulfilling criterion no.8 “they are willing to participate. This is important to show their willingness to learn” the researcher executed the following steps. First, when the researcher met with potential participants, she described what the researcher and the participants to be would do in the study group. This included the explanation on how the session would be adjusted and inserted within their working hours to not disturb their routines. However, as they did not quite comprehend the concept of continuing professional development, they rarely ask questions. In fact, most participants did not ask anything but passively follow what the researcher planned. When they are asked what to do in group, they could not decide as so many things in class were problematic for them. As the result, the topic was then explored through interviews. After assuring that minimum risk would happen and many advantages could be gained, participants were ready to form the group. In this initial stage, less information could be collected to see why they were willing to participate.

When this issue arose back after TSG had finished discussing a topic, there was some more information on participants’ willingness to participate. Regarding the importance of self-directedness in professional education, aspects related to intra-individual matter have to be taken into account. In this article, the investigated intra-individual aspects consist of personality traits and personal reference.

Personality of the participants was observed through questionnaire and their behavior in group sessions. The result of the questionnaire was scaled using *Bales Symlog Frame* (Bales & Polley, 2010) which is publicly used in internet. This calculation is strengthened by inserting the result of Big Five Inventory (John & Srivastava, 1999). Personal preference is also observed through interview regarding their past experience. The experience will be categorized into three categories; too little experience, negative experience, and positive experience (Forsyth, 2006). Accumulative result will be related to their acceptance upon their involvement and participation in TSG.

The Symlog Frame indicates that the three participants in TSG are categorized as *Down, Positive, and Forward* (DPF) in High Evaluation. DPF and UPB are in middle potency while DP is in low potency. However, DPF has low activity while UPB has high one. This finding is also shown during TSG sessions in which DPF and DP participants has fewer talk and activity compared to the UPB participant. Down and Backward are indicated by negative scores, while Zero means that the score is zero and is not labeled. Up and Forward are indicated by positive scores.

<i>Down, Positive, Forward</i> (DPF)	<i>Down, Positive, Zero</i> (DP)	<i>Up, Positive, Backward</i> (UPB)
<b><i>Salvation Through Love.</i></b> Equalitarian, submissive, conformist. Sorrowful but forgiving; love is the master cure for deviance. Religious; anti-sex and anti-aggression. Low interaction and only toward specific others; non-entertaining but socially positive. Good worker and group member; practical, responsible, high will control, stable.	<b><i>Trust in the Goodness of Others.</i></b> Equalitarian, understanding, undominating. Believes people are good, truthful, dependable. Tender-minded. Low interaction and mainly toward individuals rather than group. Asks for opinions, friendly. Calm, stable, mature, responsible, low aggressiveness and sexuality.	<b><i>Emotional Supportiveness and Warmth.</i></b> Favors relativism, permissiveness, equalitarianism; encouragement of young growth. Warm, personal, well-liked, non-anxious, entertaining, receives attention. Enthusiastic, talkative, extroverted, poised, spontaneous, confident.

More explanation to complete categories in detail can be seen in: <http://www.indiana.edu/~claswork/locked/S439/BalesTypes.html> last updated November 23, 2000.

The BFI shows UPB participant as having an extraversion traits. He has gregariousness (sociable) Assertiveness (forceful) Activity (energetic) Excitement-seeking (adventurous)

Positive emotions (enthusiastic) Warmth (outgoing), the UPF participant as agreeableness as she has Agreeableness vs. antagonism Trust (forgiving) Straightforwardness (not demanding) Altruism (warm) Compliance (not stubborn) Modesty (not show-off) Tender-mindedness (sympathetic), and the DP as a conscientiousness because she tends to have Conscientiousness vs. lack of direction Competence (efficient) Order (organized) Dutifulness (not careless) Achievement striving (thorough) Self-discipline (not lazy) Deliberation (not impulsive). During the interview, the Extrovert admits that he is an extrovert person, while the conscientiousness also declares that she is an introvert person.

From two parameters, it seems that the most potential person who is likely to join the group is UPB-extrovert participant. The other two are unlikely to support the group (Stangor, 2004). However, these results do not match to the situation where all three different types of person voluntarily participate the group. Personal preference drawn from personal experience also signifies genuine result. The UPB-extrovert participant is a person who is very skillful in organization, familiar with public spaces, discussions, dialogues, and meets many progressive people. He has positive experience in working in group.

The UPF agreeable participant has mixed experience, both positive and negative. She actively involved in school organization but she felt that there was a critical incident in which she pondered and concluded that she was lack of responsibility and fairness. As the consequence, she could not “save” her friend from school punishment and decided not to get involved in public organization. She never joined any student organization in her college years. In this case, she enjoyed positive experience in public space in the beginning while later she had a negative one. The last person in the group, the DP conscientious person has a deep personal negative experience when her father died. She admit that she loses her cheerfulness after her father passed away and she became a very closed and quiet person ever since. This character influence what she does, especially when it involves a public decision making like in teacher meeting. She thinks that she will wait people talk first and agree on any part that she feels she is agreeing with.

With variety of personal experience, these three people still accepted the challenge to join the professional development activities. Negative experience does not prevent two participants to

participate in TSG. Andragogy supplies principles that may be owned by the participants so that they join TSG. The principles are the need to know, self-directed learning, prior experience, readiness to learn, orientation to learning and problem solving, and motivation to learn. The internal motivation from personality traits (the need to know) and personal experience (prior experience) indicate that they are not the influencing factors in joining the group (Knowles, Holton, & Swanson, 2005).

### 3. CONCLUSION

The report indicates the varieties of personality traits and personal experience. Personal traits show three different traits and less different behavior in group while personal experience indicates that there are complete types of experience owned by each of them.

This background will be brought by participants into TSG process. This finding is related to the second part of the investigated aspect in the study, which is necessarily part of learning process in group from adult learning or education perspective. Further, the study might be able to examine group in its interaction and how each participant with their characteristics plays different roles. This diverse background will merge and the researcher has not known yet whether the merging process will lead them to transformation and new comprehension or stagnant development in cognition.

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## Lesson Study in Primary Science: The Story of Gagas Ceria School

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**Abstract:** This presentation portrays the progress and challenge of Lesson Study practice as experienced by science teacher group at GagasCeria primary school. Our school has undertaken self-directed Lesson Study since last five years. Hence, its development depicts consecutive changes that started from focusing teacher's teaching, grasping student(s) learning to establishing professional learning community. Specifically, the authors elucidate the 'story of adaptation' to describe 'local proof route' in practice. By observing and analyzing on the case of conductivity at grade 4, the authors explicate substantial changes in the way the science team design and reflect on the lesson. The key features in lesson designing are: 1) interrogating and selecting big ideas of the content taught; 2) scrutinizing scientific skills embedded; 3) carefully representing the content; 4) predicting possible students' responses and learning obstacles; and 5) anticipating and focusing on scaffolding strategies. In addition, key tenets for post-lesson discussion are: 1) examining effectiveness of science representation, group work, teaching sequences and students' conceptual development; 2) analyzing classroom vignettes through video clip; and 3) assessing students' work. Finally, we conclude with two 'existence proof': 1) the importance of understanding and embodying students' learning; and 2) the orientation towards improving daily practice rather than achieving the best one.

**Keywords:** Lesson Study, science instruction, lesson design, reflective practice, primary school.

### 1 INTRODUCTION

Science is subject which learning the natural phenomena which have an abstract concept. It is become a challenge for science teacher in gagasceria primary school to finding out how to present a lesson comprehensible and meaningful in daily life. Depart from these problems, the institution of school trying to improve the teaching quality of the teachers with following lesson study

This series of lesson study in primary GagasCeria changes from year to year. Beginning with a walk on his own without the assistance of any institution, teachers in GagasCeria primary school consistently implement lesson study and were scheduled at the beginning of school year. At that time the planning was done only by the teacher models. Then when the reflection, observer focus on how the teacher's teach. In the following year is almost the same as the previous year, but there is some help from the level team to prepare the tools and material for teaching and when reflection, the observer focuses on how teacher give an assessment for the students. It's occur for 4 years, GagasCeria primary school practising lesson study independently. Overall, the lesson study gave positive impact on the improvement of teaching

quality. But there are some things that still need to be evaluated among other things, a judgment against the teacher models. If there is a situation that is not good in the classroom, then the error is always the teacher models. Teacher models also get a personal assessment of how to comment on the nature of the child, or how to manage the classroom. In addition, upon reflection points Observer revealed that an inspiration, such a technique to divide the group, the way teachers get students' attention.

Consistency in the implementation of lesson study in primary GagasCeria and are considered to have high initiative in organizing the lesson study without getting any financial assistance from the institution able to attract the attention of the lesson study experts from UPI and Japan. In March 2012, a lecturer from UPI, Mr. Tatang Suratno were then invited Prof. Ancient Hiroyuki (Aichi University, Japan) and Dr. Masami Kawano (Tokyo University Japan) to hold Lesson Study in GagasCeria. Quickly SD GagasCeria information about this spread to the experts at the University of Indonesia and JICA, one of them is Ryo Suzuki. Starting from here then Mr Tatang Suratno and Ryo Suzuki became a team of experts who provide guidance throughout the planning process of lesson study conducted by a team of science teachers. Mentoring dilakukan oleh JICA expert and lecturer UPI has changed the way

of thinking of teachers in planning lessons. Teachers are encouraged to think like the students in the class. This experience got on when planning classroom 3. Then continue on the next lesson plan in class 4. Topics discussed are the propagation of heat (conduction) which will be described in the next chapter.

## 2 UNDERSTANDING OF LESSON STUDY ACCORDING TO SOME EXPERTS

According to Sukarna (2010), Lesson Study is a joint study of the learning process by themselves and the learning of others, from preparation through implementation of learning and reflect on the learning.

Ozawa (2009) stated that the lesson study is teacher activities for teachers to improve their teaching through their collaboration. Lesson study is a cyclical process and involves lesson planning (Plan), the presentation of the lesson (Do), and reflect on lessons (check) to improve the next lesson (Action).

### 2.1 Stages in the Lesson Study

*Lesson Study* is a system of activities and philosophies. So far in Indonesia, *Lesson study* was introduced as an activity comprising the steps of "Plan-Do-See-Act". (Fisianty, 2013).

#### 1. Plan

In the planning phase, teachers will collaborate to conduct lesson study planning or design of learning together. This stage is the stage in which each teacher to discuss and explore the lesson material, each studying a variety of media or props as well as how to run the stages of core activities.

#### 2. Implementation (do)

At this stage expected, both the teacher models or observers find problems occurred that could be discussed for mutual learning process on reflection.

#### 3. Reflection (See)

The third stage is a very important stage for further efforts to improve the learning process will depend on the analysis of the participants based on observations of teaching practices implemented.

#### 4. Follow Up (Act)

From the results of the reflection can be obtained a number of important new data for the repair and improvement of the learning process, both at the individual level and managerial.

### 2.2 The implementation phase of lesson studying grade 4

Based on the above presentation of the lesson study and its stages, a team of science teacher perform these steps in class 4 with a heat transfer material.

#### 2.2.1 Plan

In the plan there are five things that must be considered, namely:

##### 1. Interrogating and selecting big ideas of the content taught

Prior to the learning design, teacher discussions about big ideas and learning goals, then set the material to be taught. Then the material was analyzed by means of links between the content material that has been learned in the previous level with the material to be studied at its current level. After a thorough discussion long enough, eventually the team set a conduction material that will be taught to students at an open lesson. While learning goals:

- Students understand that heat can propagate
- Students can distinguish medium/object that can conduct heat to medium/object that can not conduct heat.

##### 2. Scrutinizing scientific skills embedded

Once the material and learning objectives are set, teams of teachers discuss what skills will be developed in the conduction material. Based on the learning objectives, skills to be developed observing and analyzing.

##### 3. Carefully representing the content

Having the skill set to be developed, then a team of teachers assign what activities can develop skills observing and analyzing. In a set of learning activities, teacher teams are very careful in choosing a material that is not one of the students to focus on capturing the concept of material that will be taught. One way to define learning activities that have been conducted in elementary science teacher team *GagasCeria* is to conduct an experiment involving non-subject teachers IPA as experimenter. In the first experiment, a team of science teacher supply various kinds of metal, namely iron, aluminum, and copper. In the beginning all participants were given the same heated iron metal. In this experiment takes

a long time to hold the iron was hot. In addition, although heated together, there is a time difference when the participants feel the heat. Then participants performed a second experiment, the metal heats buttered then affixed to beads. In this experiment more noticeable heat propagation process is marked by the fall of the beads one by one in order from closest to the heat source to the farthest. From these two experiments, the team took the lesson that the sensitivity of the sense of touch every person is different. It is less able to visualize the process of heat propagation occurs. Therefore, the team then agreed on a second trial will be conducted in the classroom.

4. Predicting possible students' responses and learning obstacles

Having established learning activities, teachers make learning steps. On measures of learning, the teacher explained the activities to be carried out to students, referral to student questions, student responses, and the anticipation of students' responses were less precise. When making predictions of student response, positioning itself as a student teacher, which means she thinks appropriate to the age of 4<sup>th</sup> graders.

5. Anticipating and focusing on scaffolding strategies

Anticipation becomes very important in the learning process of the students, as it helps to direct the focus back on learning objectives students. Teacher's ability to make predictions of the response varied greatly determines child anticipation to do if it actually happened while in the field in order to achieve the learning objectives. At the time of formulating the measures of learning, the teacher actually been made to anticipate and respond to students by focusing less precise. For example, when students conducting metal observed demonstration smeared margarine and taped playhouse and then heated over a candle, the teacher gives direction question, "Is the playhouse coincide?" Then the teacher made the student response prediction "No / yes." For children who responded "yes", the team made in the form of proving anticipation. For those who responded "no" go to question the direction of the next.

**2.2.2 Pre Open Lesson**

Having a set of steps, the next step is a test of that which has been created through microteaching. Microteaching aims to see the stage of what is still needed to be in order to provide better

for the purpose of instruction learning achieved. The teacher taught in accordance with the measures that have been made. Observer activity that occur in the classroom, as the student the efficacy of the tools and materials, collaboration in the study and the lesson.

Based on pre-open discussion lesson, they get some note, namely:

1. Demonstration activities by showing melting butter on a spoon dipped in hot water is done. However, the necessary questions to focus children's attention: "What happens if butter smeared on a metal bead attached heated?"
2. After conducting a series of experiments in each group, the teacher models will perform demonstration experiments on wood. This is to avoid the danger of highly flammable wood as well as more 'condition' experiments on the concept of a weak conductor. The demonstration was guided by the question "Is the wood the same thing will happen as in the metal?"
3. To associate the concept of conduction with the context of everyday life, the teacher will show the model with wooden handles. These activities will be guided by the question "Why does this pot using two different materials? ". Then the children were asked to discuss with their group mates. The activities of this discussion it is important to facilitate the process of exchanging ideas. At that time they were expected to have started experimenting with connecting link between the metal and wood with a wood-handled pan display.

**2.2.3 Implementation (Do)**

Lesson should be conducted in accordance with the result of the study on the reflection pre-open lesson. A team of observers from observing four aspects during the lesson in the open it is the students, the efficacy of the tools and materials, collaboration in the study and the lesson.

In general, the acquisition held in accordance with a plan. The demonstration and the trial run smoothly. However, there is something interesting in lesson study held at 4, namely:

1. When children described the trial. Some of the children there is confusion to describing the results of experiment. Apparently they were still riveted on the picture a model exemplified.



2. The one group that long awaiting of beads, any member of a group that an initiative to close the heat source told the beads and finally fell.
3. The events beyond belief, the teacher aroused auction on a skewer. Skewer burning and beads are dropped. The students responded, “fire!” but students even be able to conclude that the transfer heat, but far more than a metal.

#### 2.2.4 Post Lesson Design (See)

This stage is very important that the improvement process would depend from an analysis of the participants of the lesson based on observation by. Therefore on this stage vitally necessary inputs from an observer good fellow teachers or from experts. In addition, key tenets for post-lesson discussion are:

1. Examining effectiveness of science representation, group work, teaching sequences and students’ conceptual development.
2. Analyzing classroom vignettes through video clip.
3. Assessing students’ work.

During post lesson design found several inputs, such as:

1. Prof. Ono of Japan provide feedback on scientific approach based on a phenomenon pertaining to everyday life. For example by means of bares saucepans early in learning while asking essentials question “Why saucepans the doorknob made of the wood?”
2. Prof. Maeda of Japan warned the importance of variable control. At a spoon metal inserted into glass containing hot water, should any variable comparison. For example, one more spoon from wood or metal fixed spoon but inserted into glass contains water cold.
3. Prof. Maeda ask question “Why choose melted margarine for?” She argues margarine takes longer to melted. Hence, a team of teachers selecting a more effective for learning with roombutter.
4. An observer team of elementary GagasCeria provide input of pictures. Models are not teachers should give an instance of pictures on board because some students tend to follow the teachers not drawing based on the observation. So better tools and materials are stored at table fixed betatesting students and so students draw with see tools and materials are in sight.

#### 2.2.5 Follow Up (Act)

After all, given input of observer Prof. Ono given the challenge for science teacher in a school for teaching the conduction of another in order to look at how the students in the school after undergoing repair education planning.

They agreed to focus on three things. First of all, conjures the beginning, are showing a breech-loading wood. Second, providing variable control, that which is smeared margarine spoon into the water hot and cold water. In practice, we change margarine with roombutter it is easier to melt. Third, the tools and materials remain deposited in the experiments in order to facilitate students while describing the results of observations. Fourth, the deepening discussions with iron smeared roombutter showed that affixed beads. The purpose of the discussion was asked the students to berhipotesis. A model student aimed to predict what will happen in beads.

From beginning to end in this school students could understand matter well. Whereas when asked describing the results of observations they had lost. However, they try to depict the results of observations by utilizing instrument materials are stored at table. The changes that result obtained from reflection making teaching better than before. Students can more easily catch material delivered.

### 3 CONCLUSIONS

Finally, we conclude with two ‘existence proof’:

1. The importance of understanding and embodying students’ learning.

The orientation towards improving daily practice rather than achieving the best one.

### 4 ACKNOWLEDGEMENTS

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## The Changes Of Thinking Process in Planning Math Lesson Through Lesson Study

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**Abstract:** Successful learning is determined by well made planning. Planning can assist teachers in implementing a structured learning and focus on the learning objectives. Therefore, teachers need to have good skills in planning a lesson. The series of lesson study conducted by GagasCeria Elementary School mathematics team brought a major change in the thought process in designing a lesson. Initially, the teacher's only focuses on the personal viewpoint not consider a child's perspective and the selection of material that is essential. Teachers only focus on the learning sequence and activities not on the conceptual development or considering the learners as a subject. Through Lesson Study, math team plan together and do a lot of in-depth discussion on the objectives and learning materials, predicted responses by learners, learning material, conceptual development, learning sequence, and student collaboration that occur. In the planning session, the team tries to predict the possibilities that occur related to the child's response, and trying to anticipate. After the lesson is conducted, the team re-assembled for reflection. The team evaluates the achievement of learning objectives and determines the follow-up needs to be done to improve the lesson. Various opinions were delivered during this discussion that enrich the thinking of teachers

**Keywords:** mathematics, lesson study, thinking process

### 1 INTRODUCTION

The development of science and technology as well as changes in the view of education requires teachers to be more innovative in designing a lesson. This means that teachers must make changes in setting and implementing the learning. Learning is implemented using approach or methods vary with other learning resources that meet the educational elements.

Planning is basically decided an action or activities to achieve a goal. In order to decide precisely teachers must have the ability to predict the possibilities that could happen.

As we know, lesson is the interaction between teacher and students to achieve the learning objectives. The purpose of learning itself is a means to develop a student's ability by encourage students to think. When thinking, students will integrate all the skills and knowledge that he had to build a whole

new experience. So in other words, lesson is a way teachers do to prepare the new experiences for students.

In planning a lessons, teachers are expected to prepare materials, using the learning media, using an approach or method of lesson, and make an assessment or evaluation within a certain period of time to achieve learning objectives that have been defined.

Children of primary school age, their level of thinking is still in the realm of concrete. They can think logically if the things are concrete or using manipulative. So at this age, they still need tangible thing to understand a concept. They will also more easily to understand something if they do it directly or directly involved during the learning. Children also cannot be separated from the world of play. The needs to play and move are still very high. In addition, children are happier when working in groups. So, the activities of the group will further

motivate them to learn rather than individual activities.

Based on statements above, a good learning is the learning that can facilitate students to gain new experiences through the process of thinking. Lessons will go well if carefully planned. Teachers must be able to organize materials, media and methods of learning into an activity that develop students by regard to student characteristics. Therefore, the math team of Gagasceria as teachers felt that planning played an important role in the success of a lesson.

As a teacher, Gagasceria math team also trying to make a good plan in the hopes lesson to be going well and the students were able to understand the concept or the material being studied. In planning lesson, math team of Gagasceria trying to explore a variety of learning resources such as books, movies, or props related to the lesson material. The team tries to deepen the knowledge of mathematics curriculum materials by studying and reading a lot of books. As a math teacher, math team of Gagasceria often faces difficulty to teach the steps in the mastery of the material or procedure to resolve the problem. From the book we read, Gagasceria math team trying to learn the steps or procedures and trying to apply it when conduct a lesson.

In designing the lesson, the team is also considering the student characteristics. Gagasceria math team tried to design fun activities for students. The team tries to learn learning methods that are fun and trying to apply it in the classroom. The team usually packed activities in the form of a game. The team expect the activity will gain interest and increase student motivation in learning because students can learn while playing. To facilitate the students' level of thinking that are still concrete, the team also attempted to use a lot of props hoping students will easily understand the material being studied. In fact, sometimes the team made their own props, which is expected to help students to learn.

The lesson indeed running fun. The kids look happy and active in learning. They like to study mathematics because a lot of activity in the form of games and lots of props are used. But behind it, the team feels there is something lacking. When team evaluating, it turns out that the students are still have many difficulties while doing math exercises. In other words, they enjoy the learning activities that are carried out, but have difficulty understanding the material or concepts learned.

Based on the lesson that has been done, Gagasceria math team find various problems. Learning objectives specified in the learning is not achieved well. Though the math team of Gagasceria've been trying to plan a fun lesson method for children and props also been widely used during the learning. The team also has been trying to apply things get from various sources varied

learning. Children also seemed to enjoy lesson mathematics in the classroom. But apparently students still find it difficult to understand the concept.

This makes the math team want to find the root of the problem and find a solution to solve these problems. Gagasceria math team wants to make improvements so that the team can make the planning that can optimize the ability of students in mathematics. Therefore, the team wanted to improve lesson of mathematics by performing a variety of ways such as: lesson study by math team, discussions with competent expert, implementation of lesson outcomes from the discussion.

## 2 STUDY BY MATH TEAM

Based on existing problems, we took the initiative to try to do a lesson study team limited to elementary mathematics Gagasceria Bandung. Team members take turns to be a teacher model and conduct lesson in each class. The team hopes that through the activities of this lesson study, all team members can learn from each other and discuss.

Teachers whose turn it into a model, will do the planning and preparation of their own lesson. Teachers should determine their own model of the material or learning objectives to be achieved, the learning method or props are used, and also the learning sequence that will be done.

During open lesson, other team members will be observers. It will observed all the processes that occur during the learning. After lesson, the team immediately conducts an evaluation. In this evaluation, the team discussed the positive and negative things that occur during lesson. However, from the discussions that took place, the main concern was what is done by the teacher. Teams more emphasis on classroom management performed by the models teacher. From this discussion usually the team will agree on what good things that can be replicated or applied in their respective classes.

All members of the team already had a turn to be the model teacher. From a series of lesson study already done, the team feels there is an improvement in every lesson conducted. Based on the evaluation, the team found that classroom management is increasing. But the team still has difficulty to improve students' understanding of the material or the concept being studied. Classroom management looks more orderly such as how to organize sitting arrangement of students, the criteria for students collaboration, how to divide the material to make it more effective tool, how to motivate students with a positive appraisal, giving instructions look even better.

Based on the results of this evaluation, the team along with the school component trying to discuss

what caused the difficulties in students understands the material. It turns out from the discussions conducted, the team realized that the team members already have the same viewpoint on learning. This leads to our point of view not much different. Therefore, the team having trouble finding the root of the problems occurred in the teaching of mathematics in GagasCeria elementary school.

### **3 DISCUSSION WITH EXPERT IN THE FIELD OF EDUCATION**

#### **3.1 Visitor from Japan**

In March 2012, GagasCeria elementary school gets a visit from Dr.Masami. He is an education expert from Japan who actively conducts research on learning in school. Dr. Masami observes the lesson conduct in third grade. The lesson was about the measurement of time.

Planning is carried out by teacher in the same grade from various subjects. The planning is not focused on the content. Team discussion more emphasis on what material will be taught, how to encounter and how to shape its activities. For in-depth analysis of teaching materials are not discussed in the team but just thought by the teacher models. No discussion or questions from peers or other related material that would be difficulties experienced by children. The planning focus on the flow of activities. Actually, that day activities are a review before assessment. But since this is an open lesson, then the unthinkable by most members of the team are activities that "scene", not as usual. The idea of the activities students do exercises in class, on the desk each individually or in groups directly rebuffed. It was decided that the activity was Challenge Post. Students will work on various issues which are stored in a particular post. Students are divided into several groups. Distribution of the group is based by the students' ability in solving mathematical problems. Students will be instructed where questions are stored. Not all questions were given to each group, but depending on the student's ability. Students will be in groups looking for posts about the places stored in accordance with the map provided by the teacher. The posts are not only near the class but deployed at various places in the school. Students are asked to solve the problems in each post within a certain time. If student hear a bell, students will move on to the next post. Upon completion, students are invited to perform classical discussion in class to discuss the perceived problems that are still difficult to resolve. The students were very enthusiastic to follow the activities and trying to complete the assigned task well. Every sound of a bell, the students seemed

eager to run to the next post. They did not look tired or complain despite having to go up and down stairs.

The team felt that they plan successful lesson because the children look happy and enthusiastic. However, the comments given by Prof. Masami turned out beyond our expectations. He declared that "the children are happy to take part in the learning of mathematics but do they really learn math?"

This statement makes us really shocked and trying to think more deeply. What is the cause? Is this the root of the problems that we've been looking for? We want students to enjoy learning mathematics, but it turns out we were stuck in this situation. We just focus on designing attractive packaging activities for children instead of what will children learn. We tried a variety of methods and materials to create a variety of tools to make children interested in learning. In practice, it is the children become enthusiastic about learning mathematics. But the enthusiasm of children while doing activities is not a big influence on their understanding of the concepts or the material being studied. There are still many children who have difficulty in learning mathematics.

Starting from here we feel that we need to cooperate with outsiders to study and improve the teaching of mathematics in GagasCeria Primary School.

#### **3.2 Discussion with Prof. Didi Suryadi, Tatang Suratno, and Endang Mulyana**

On one occasion, we met with the school academics that focus on improving teacher quality through lesson study. The school formed a partnership to provide guidance for math team. We were accompanied by Prof. Didi Suryadi, Mr. Tatang Suratno and Mr. Endang Mulyana. Assistance began in September 2012. At first the team thought, mentoring will do in the form of lectures and question and answer. The team imagine there will be many explanations of how to design appropriate learning, what is a more effective method used to teach math, how to make children quickly understand the concept, etc. Then there will be a question and answer session about the learning activities such as: what is the difficulty teacher are currently face during teaching and teacher will immediately find an answer that they can apply in the classroom. But it turns out we were not quite right. Mentoring sessions occur the form of discussion. And from this discussion session we got a lot of enlightenment. The team get much insight from discussion to make good planning.

At the beginning of the discussion session, the companion provides many questions that we never imagined before. But the question made us think a lot



about what the team've done to teach mathematics. Have we fully understood the philosophy of mathematics? Do we believe that math right? Do we really understand the material and learning objectives of mathematics? Do we really know our children are taught? And many other questions.

From some of the discussions, there was a discussion that makes the team way of thinking changed. We were very shocked when Prof. Didi Suryadi shows a picture of a frog who shared his experience on the land to a fish. The frog tells about a cow and human it sees. But apparently what is told by the frog caught differently by the fish. The image of cows and humans in the frog's head is very much different from the image of cattle and humans in the head of the fish. Though the frog had tried to tell clearly what it saw. And there is nothing wrong with his explanation. But because the fish never went ashore, he thought cows and humans, is also a kind of fish with different variations.

This story turned out to be an analogy of practice we've done in class. Through this story, the team starts to see the answer of our question. Our mindset as teachers must be very different from the mindset of a child as a student. Perhaps as a teacher, we've tried to explain the material clearly. We also tried to make the tool material that we think will allow children to learn. But, what if it was not? The material that we provide may be can help us to teach. But for a child it can be a thing that is confusing or meaningless. We think that we have prepared a tool material will allow the child to learn. But apparently, according to the kids it's just a fun thing to play. Apparently when designing learning, we have to get into the mindset of the child and trying to think as a child so we can know what the child felt about learning. And create a learning path that makes kids think. Thus, we will also be able to predict the possibilities that occur during the learning. What the difficulties that will be experienced by the child and how do we prepare appropriate responses or actions to help the difficulties experienced by the child.

### 3.3 Lesson study seminar and workshop in Japan

One of the math team members have the opportunity to follow seminars and workshops Straightening Mathematics and Science for 3 weeks in Naruto, Japan in November 2012 led by Prof. Gerrit Stols, Prof. J.M.Rogan, and Prof.Yumiko Ono. Two things were given to the participants of the workshop which until now have been and still the team use during planning a lesson is a list of things that need to be considered when planning a lesson and lesson tree. By making tree lesson we can see the learning goal (for example problems should be resolved by

students) and also prior knowledge students should have mastered in order to understand the teaching materials.

## 3.4 Open Lesson

### 3.4.1 Planning session

#### ➤ Determine the main concept

In one of the next open lesson, the team tried to implement new things they have learned. Accompanied by Mr. Endang Mulyana and Mr. Tatang Suratno, the team tried to design a study to identify the basic shape in the figure.

Preparation begins with a discussion of the concept and content to be taught and the activities that will be carried out. In this discussion, Mr. Endang asking questions to challenge the thinking of the teachers. Determine the main concept to be taught is not as easy as imagined. What comes to mind is to read the indicators and look for activities that approximately suitable for children. It turns out there are things to consider such as what does the relation between material being taught in class today with a previous class or grade. Well ... the teachers have to know the spiral curriculum so that teacher can find the substance of the material to be taught. By mapping these materials, we can find the essence of the material, so that the material to be taught not to collide with the previous material and can be the basis for a class or support skills afterwards. Mapping of material can be done by making a lesson tree. In this lesson tree, we describe what skills children should possess before studying the material (stored in the root of the tree) and what skills will be obtained after the child learn the material (stored in the branches of a tree).

In this lesson, children are expected to recognize the basic shape (square, rectangle, triangle, circle and half circle) contained in a figure.

#### ➤ Learning Squence

After the lesson tree is complete, the team began designing learning squence. The team are starting to plan some activities that can stimulate children to think. Activities are designed to be related and should reinforce the understanding of concept that has been obtained in the previous activity. There differences of opinion about what activities are going to do. Some suggest that the child should be given a paper, and then they should cut into shapes. After that, the child will be asked to reunite the pieces that have been cut earlier. From this activity, the child is able to understand the concept of area. The area will not be increased or decreased, despite being divided into sections or shapes. By looking at the ability of second graders were mostly don't have good skill to cut, it is predicted to be a lot of trouble when cutting

out and there is the possibility of some form of missing because one tucked or scissors so that it will be difficult for the children. In addition, the core of the matter is to identify the basic shapes that form a figure. Another suggestion that the child will be play puzzle shapes. This puzzle shaped kinds of images consisting of several basic shapes they have learned. From this activity, the student is expected to recognize what kind of shapes by observing the characteristics of the it's shape.

After discussing the advantages and disadvantages of each activity, it was decided that the activity will be puzzle shape. The hope of this activity, in addition to building a child's concept of identification basic shape that make up a figure can also stimulate the creativity of children.

Based on the main activity is playing a puzzle shape, we tried to design the apperception that can build interest in the child and can be the bridge to get into teaching. From video of mathematics learning in Japan, the team was inspired to make activity cards. Teachers will provide 5 cards with each picture contain a square, rectangle, triangle, circle, and semicircle. Teachers will call 5 children to make an educated guess about each card. Each student was asked to name the characteristics of basic shape contained in the card. After his friend can guess, the teacher will ask the student to name objects that had that shape. From this activity tem expected that many children will involved and bring the student learning to identify shapes.

➤ Learning Material

After learning squnce is established, the team began to create a learning material needed. Initially we make basic shapes of a certain size, and then started to make compound figure to identify. We choose to forms animals figure. Apparently after we try to another teacher and to 5<sup>th</sup> grader we learnt that this material is less effective tool because for one compound figure, basic shapes used can vary. It was felt to be difficult for children and takes a long time to make. And the teacher will find it difficult to estimate how many basic shapes needed. Based on these considerations, the team finally decided to design a basic shapes that will always be used in any figure. When designing any figure, children were asked to use all the available basic shapes.

➤ Do

For this lesson we had 2 cycles and attend by Prof. Yumiko Ono and Abe Sensei. For the first cycle, the lesson successfully done according to plan. The student very enthusias engaged in the apperception. When the student had to identifying shapes, the time it takes sooner than expected. At first the teacher that conducts the lesson was confused, deciding what to do. Then the teacher think there should be a challenging activity to reinforce the child's

understanding of the shape. And in the remaining time, the teacher uses it to explore the combined forms. For example, what basic shape that can be form into rectangular or circular shape? This activity was to make children enthusiastic and getting to know the characteristics of the basic shapes. It turn out the ability to know the characteristics of basic shapes strengthen student ability to identify basic shapes that form a compound figure.

➤ Post Lesson Discussion

After the implementation of the first cycle, we conduct a joint evaluation. It turns out that the activities carried out much easier for the student so that much time left. Changes to be made are the time to identify accelerated and children make shapes and present in front of friends.

Implementation of the second cycle, in contrast with cycle 1. It appears that many children experience difficulty in identifying basic shape of a compound figure. Activities that was improvised by teacher in cycle 1 turns out is important to build the children's ability to recognize the characteristic of shapes. And this is the ability to support the child in identifying the shapes that build a compound figure.

From the evaluation, it turns out the plan is not necessarily good for 2 classes because the characteristics of the class is different. As teachers, we must know the characteristics of our children so that we know what is right for them. In addition, many things learned from this evaluation. Apparently when planning, as teachers we have to think about everything we choose. Starting from the content, learning sequence, the development of concepts, tools and materials, and prediction of response by the student. The teacher need to think about the impact on the student.

## 4 CONCLUSION

Based on a series of lesson study, the team felt a lot of changes that occur in the planning a lesson.

➤ Originally when designing a lesson, teachers pay attention to the characteristics of the child, to find attractive packaging activities for students. Teachers do not try to understand the mind of a child. So that teachers can not understand why the child having trouble mastering the material. When the teacher tried to design the program with the mindset of a child, the teacher not only can predict events that are interesting to children, but teachers can also imagine the thought process that will be experienced by the child. Therefore, teachers will be able to predict the likelihood that will happen. For example, difficulties that may be

experienced by the student and the teacher can devise strategies to help the child.

- In planning lessons, teachers must understand the material that will be learned during the learning. Teachers can not only know the indicators contained in the course curriculum. Teachers should be able to draw the essence of the material to be taught. Teachers should conduct the material spiral curriculum mapping. In other words, the teacher must know the link that will connect material taught in previous class, today class and the next class, so will avoid the buildup of material. The material learnt in the previous class can be the basis for learning material that will be taught. And the material can be taught to master the material that will support in class afterwards.
- In designing a learning sequence, the teacher should address the linkages between activities chosen. Not to be biased or activity is not sustainable. Because understanding the concept of a child being built will be thrown. Teachers should choose activities that are interrelated and reinforce the concept of development in the child's head.
- In selecting teaching methods, learning resources, materials or tools teachers cannot just take the

exact same or copy a lesson plan. Teachers must adapt according to the needs of children in each class. Since each class has different characteristics. A good method of learning can be done in a one classroom but may not be effective for another class.

These changes are now always done by a team of mathematics in making a lesson plan. This change turned out to be a positive impact on learning process in the classroom. More effective learning and students' understanding of concepts or materials studied increases.

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## Lesson Study Cycle: Designing and Evaluating A Model Kit

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**Abstract:** April 2013, there was a science lesson study in grade 3 at GagasCeria primary school which would discuss about the reason why a flood could happen. At the beginning, science teachers' team designed the demonstration kit. The demonstration kit was a small village inside a cube transparent aquarium. In one occasion, an education expert who assisted science teachers' team delivered a question due to the demonstration kit, "What make you sure the demonstration kit could help pupils get better understanding in flood concept?" At that time, the science teacher' team could answer the question but they were doubt by their own answers. The expert assist by giving knowledge that before designing a model kit, teacher should know what main core would be delivered to pupils. A model kit which would be designed by teacher should correlate flood concept with previous concept so it would help pupils to get better understanding and it also ought to help pupils to achieve the learning objective(s). After got better understanding in designing model kit, the teachers discuss how to use the model kit effectively. Teachers discuss the questions that would be delivered to pupils and predicted what responds could come from pupils. Pupils' responds sometimes would not align with learning objective(s), in this session teachers also discuss what aid(s) that teachers should give so the model kit could help pupils engage to concept conveniently. In post lesson discussion session, another education expert assist teachers to evaluate weather the model kit worked effectively in assisting pupils' understanding through pictures that pupils made during observation in science learning.

**Keywords:** lesson study, science learning, model kit

### 1 INTRODUCTION

Improving teachers' quality has become GagasCeria management's concern through the time. Lesson study is one path that has been chosen by GagasCeria management to develop its teachers ability. In other to achieve GagasCeria's goal, it involved education expert to escalate teachers' quality.

In school year of 2011/2012, 4<sup>th</sup> grade science teacher conducted lesson study about pressure effect on volume and shape. At the planning session, 4<sup>th</sup> grade science teacher was assisted by science team of GagasCeria Primary School. The team made list what media would be used during experiment, such as clay, colored water, and balloon. The purpose of using clay was to show the effect of pressure. Pressure in solid state would change the shape but not volume of the clay. Clay would be covered by wrapping plastic and put in a certain water volume.

Colored water was put in a holed plastic bottle. The lowest hole would cause high pressure so the water which went out from the lowest hole would reach the farthest. After no water left inside the plastic bottle, students would measure the volume of water inside plastic bottle. It would show that pressure on liquid state would not change shape and volume.

Pressure in gas state was shown by using balloon. Students would be asked to blow balloon. They would touch the balloon while gas was pumping inside the balloon. This experiment would explain pressure in gas state would change shape and volume.

After science team chose the media, we designed instruction. The team was only focus in sentences structure which would make students understood when they read it so goal learning would be achieved.

There were some difficulties that were found in "do session", such as there were so many

equipments on students' desk, so the equipments could be distracters. Besides that, some of the students did not understand what they read in the instruction. Students found difficulties when they tried to make conclusion from the experiment that they conducted.

Reflection for the first teaching learning process was focused to the clay. At the first day, clay was covered by plastic so it was hard to observe what happen to the clay when students pressed the clay. So the science team made up one mind to open the plastic for the second teaching, so that it would be convenient for student to observe what will happen to the clay if they pressed clay. Since second teaching, the science team was gathering to reflect about teaching learning that has just conducted. Some conclusion, from the discussion:

1. Apperception was not quite effective to engage students about pressure effect on shape and volume.
2. Instruction was too long.
3. Uncovered clay could show the effect of pressure to solid state shape but the clay dissolved in water so it was hard to observe the volume which was shown by number in measurement glass.
4. Teacher only prepared for media/model kit but there was no trial for the media.

## 2 ASSISTANCE FROM EXPERT

As a continuation of the reflection sessions that have been done, science team finally got help from Universitas Pendidikan Indonesia (UPI) expert. He asked science team to carry through reflection by putting media used to conduct experiment about effect of pressure on shape and volume. Obstacles encountered during the learning process performed by 4<sup>th</sup> science teacher were:

1. The instruction sheet was too long allowing multiple interpretations occur in the process of understanding it on students' mind. It brought on different perceptions of each student. Differences in students' perceptions caused experiments conducted between the onet group with other groups resulted vary conclusions since every student could focus on different thing.
2. In order to guide students to be able to deduce from the experiments conducted, it may be other alternatives, for instance giving a demonstration to the students how to do the experiment.

At the next meeting, UPI expert showed instructional video of a Japanese teacher who joined JICA. In the video, JICA expert SR asked students

to gather in front of the class to surround him. Students who were in the front position were asked to sit on the floor so that students who stood behind the first line could see what activities carried out by the teacher. The video showed an experiment proving that sound is caused by vibration. The teacher utilized a simple trumpet made of paper. On one side is a hole for the intake of air while the other side shaped like a rectangular sheet of paper that if there was air moving through it, there would be sound and part of the rectangular sheet would be moving. First, students looked carefully at teacher explanation, and then they conducted experiment independently.

The video showed that teachers know exactly what he wanted to achieve from the learning process. Media used to prove that the noise generated from the vibrating has also been considered carefully so that students do not need to make the media, but the trumpets has been made by teacher . Students would focus in observing what would happen on the square sheet at one end of a trumpet.

At the next meeting, UPI expert provided all the equipment which was needed to prove that the noise generated from the vibrating. Science team tried to make papered trumpet as media to prove that when the object produces sound, it also meant the object is vibrating. When setting up the media/models to be used, the team encountered difficulties. Not all trumpet sounded. This experience could actually be used to consider whether the media would be made by the student or would be made by the teacher.

## 3 LESSON STUDY AFTER EXPERT'S ASSISTANCE: MOCKUP FLOODING

In April 2013, 3<sup>rd</sup> science teacher would conduct lesson study about flood. Objective learning from this concept knew the influence of human behavior on the natural decay. Furthermore, the aim of this topic is persuading students to put garbage in rubbish bin in order to avoid flood. In this occasion, 3<sup>rd</sup> grade science teacher revealed her difficulty in explaining flooding 3<sup>rd</sup> grade last year. Students seemed confused to distinguish between flood and erosion. The first idea was to build a village mockup. Science team provided an aquarium, clay, and wooden blocks. Wooden blocks were arranged as village foundation. Wooden blocks would be covered with clay in order to form land and river. There were higher and lower ground, so students

could observe water will flow from high to low ground. There were several obstacles that were found during making flood mock up, for instance; 1) the flood mock up were too heavy so it needed several persons to carry it from teacher room to class room, 2) it took long time to dry the clay, 3) the clay might crack when it dried, 4) the flood mock up could not visualize the effect of garbage on waterways.

### 3.1 Systematic Thinking: Triangular Thinking

UPI expert found that science team got discomposure when the team should connect among objective learning, how to deliver content, it's content. He assisted the team used triangular thinking.

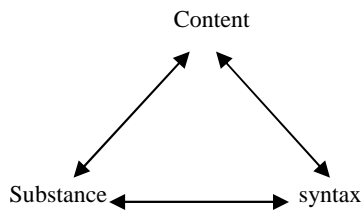


Figure 1. Triangular Thinking

When a teacher designed a lesson, he/she should understand the connection among content, learning objectives, and how student would learn in the classroom. Steps in designing a lesson based on triangular thinking: 1) teacher should connect flood with previous concept that has been learnt (content), 2) teacher should connect between previous concept and objectives learning (substance), 3) method of delivering content to students.

From discussion, science team decided that water's flow concept could be the basic knowledge to deliver flood concept. Water could flow streamlined on waterway when there were no garbage, but the water would get hindrance when there were some garbage inside the drain. When there were a lot of garbage inside drain, water would not flow streamlined. Thus, in wet season, it would be possible that drain could not accommodate volume of water.

When the science team already understood the concept that should be delivered to students, the team teams focused on strategy to assist student achieve objectives learning.

Science team tried to visualize drain used plastic bottle. Water would flow through the bottle and

some would be putted inside it. Because there was some garbage inside plastic bottle, water flow would be clogged. 600 ml plastic bottle was cut sloping at the bottom as a water way to enter the bottle. So as students could observe water flow inside the bottle clearly, the team decided to make blue colored water. To sort the garbage, science team decided fabric, cotton, and gravels. That garbage provided obvious comparison between unfilled rubbish and filled rubbish drains.

### 3.2 Post Lesson Discussion at Soka Primary School: A New Insight to Design a Lesson

Science team got opportunity to participate in Mathematics open lesson about symmetry at Soka primary school. At the post lesson discussion, there was enlighten insight to improve lesson study and teachers' quality at GagasCeria primary school. As a teacher, he/she ought to imagine what response would come out from student so teacher could predict the anticipation. Thus, teacher would be able to assist students to achieve objectives learning from experiment that has designed by science team.

This new insight was implemented in designing flood lesson. Table below shows lesson design that was made by GagasCeria science team in designing flood lesson.

Table 1. Flood Lesson Design

Topic : Flood  
Objective learning : Students could understand the concept of water flow, blockage, and overflow

No.	Students' Activity	Question	Anticipation of Students' Responds
1.	Observing the water flow on a plastic bottle through demonstration.	a. What happens to the water? (Water moves / out of the bottle) b. What is the name of water movement? (Flowing) c. How	Fall dropping thick book

		What is the flow? (The water could flow streamline d)	
2.	Observing demonstrations severely blocked water flow of garbage.	a. What about flow? (small water flow, water flow clogged / blocked) b. Why the water flow is different? (no garbage that block the flow of water)	The number of different bins little trash can clog the water flow There is a little trash, the trash is so much So, and may we put out the trash even a little bit in drain?
3.	Observing the overflow of water due to blockage of garbage.	a. What happens when water is added clogged plastic bottle? (The water overflowed out)	<ul style="list-style-type: none"> <li>▪ Water spilled</li> <li>▪ The water is everywhere</li> <li>▪ Water flows everywhere</li> <li>▪ The bottle full of water</li> </ul>
4.	Summing concept: water flow will cause the water overflows	<ul style="list-style-type: none"> <li>▪ So, the water flows streamlined if there is no clogged.</li> <li>▪ So, the water will not flow streamlined if there is a blockage.</li> </ul>	<ul style="list-style-type: none"> <li>▪ If there is no garbage inside bottle, water will come out swiftly.</li> <li>▪ If the bottle clogged, the water will not flow out swiftly and out of the top of the bottle remind students to the term overflow</li> </ul>
5.	Students do the experiment		
6.	Students write a report experiments about flood		
7.	Connecting concepts to daily life <ul style="list-style-type: none"> <li>▪ Not littering is one way to preserve the environment.</li> </ul>	(Do demonstration again) Reflection questions: <ul style="list-style-type: none"> <li>▪ Imagine this bottle is the drain in</li> </ul>	

		front of your house! <ul style="list-style-type: none"> <li>▪ How to keep the flow of water in the drain streamline?</li> </ul>	
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### 3.3 Tuesday (April 16, 2013, 07.35 am): Flood



Figure 2. Situation during demonstration

At the “do” session, 3<sup>rd</sup> science teacher held demonstration in front of class. Teacher utilized two tables to conduct so that students could see flood demonstration clearly. This idea come out after watching JICA expert SR teaching video.

Teacher began to do one by one phase of activity, as already planned. Students focused and enthusiastic watched every phase of flood demonstration. As a result of detail and specific designing the lesson, it assisted teacher to guide students to achieve goal learning at that meeting.

Furthermore, students conduct experiments in each group. They observed the water flow and took note based on their observation on their notebook.

At the closing, students were given guide which would connect between water flow and their life. Teacher engaged students to imagine if the plastic bottle is a drain in front of their house what would happen if there is a lot of garbage inside it during wet season.

### 3.4 Student S vs. Student R

It was time session for PLD (Post Lesson Discussion). On this occasion, the JICA expert SR said that the preparation that 3<sup>rd</sup> grade teacher and science team have been was good. Using the blue water could present flooding and the flow of water in the plastic bottle so it could be clearly seen. After observing water flow, students had to draw and write

on their own note book. The notebook could substitute blank worksheet so students' would be able to think creatively when using a note book (blank worksheet).

Furthermore the expert SR invited us to determine the follow-up step in order to develop better learning. He invited us to see the difference images of two students. They are student S and student R. We read the same conclusions about the concept of water flow, either from the writings of student S or student R. Then, the expert SR directed us to observe in more detail and compare the two images of the two students more carefully. He invited us to see the significance of the two images. We were invited to see the difference of the two images, while conduct same experiment. The expert tried to dig in and help us to be able to see the difference of the two images. Although they conducted same experiment, both student could understand the concept of flood, but the result of observation could be different.

His JICA expert guidance, finally science team can see the difference in the picture of student S and student R. The first image that science team observed is the student R's image. There were 3 images experiments that he drew. The first image was plastic bottle A that contains only water. The second image was bottling plastic B containing cotton, cloth, and water. And the third picture is a plastic bottle C containing cotton, cloth, gravel, and water. All the bottles in a tilted position. Student R illustrated the same water flow from three different experiments in each bottle. The amount of water flow that he drew was same. After discussion about drawing and conclusion that has made by student R, science team found if student R could not distinguish the flow of water went out of the plastic bottle although he could describe the condition of garbage were different in his three plastic bottle images. Science team also discussed what was the reason that made student R had trouble distinguishing the flow of water went out from plastic bottle. Perhaps he did not focus when performing an experiment, or student R have different focus while observing the experiment.

Then science team saw student S's observation. Student S describes the three different water flows from each treatment. Plastic bottle A was not clogged, the water flow swiftly. Plastic bottle B with little obstruction, the water flow was not as big as water that went out from plastic bottle A, and plastic bottle C with a lot of blockage, the water flow small. We saw the Student S was able to understand the concept of flow and barriers, so he could observe

and draw in accordance with the expectations of teachers' plan. He already understood, if different clogge wolud affect different stream of water coming out.

The expert SR invited us to find things that can make students' understood the concept of flow and obstructions such as student S did. The expert SR explained that if the sstudent S focuses on water flow out of the plastic bottle so that he could do the observations well. While student R focus on the way he poured water into a plastic bottle, so he did not focus on the water that went out of a plastic bottle. Science team continued the discussion and concluded about the importance of providing a comparison between the experiments when students observe the empty plastic bottle with a plastic bottle containing garbage. If this is done, the teacher could train students' scientific thinking by comparing both experiments and discover the difference.

The expert SR also reminded of the importance of adding the story ideas are more meaningful for students. Drains could be made as a sewer to build the story. Students are invited to take out the trash and then put the trash.

Through this way, students will be able to imagine the concept of flooding if teacher analogied daily phenomena to serve experimental material.

PLD session with the expert provided a lot of insights for science team. Science team got a lot of insights on how to plan a lesson. Not just good planning, but what could teachers do to students to achieve learning goals that teacher wants. Science team also were very aware of the importance of predicting responses and anticipateng of the students in the class. The presence of a comparison in a science experiment also made a very interesting insight for science team, so that students could make observations and scientific thinking processed by comparing and finding differences.

### 3.5 A Bit of Enlightenment

In August 2013, two JICA experts visited Gagasceria primary school. They would like to share knowledge on scientific approach. Science is used to explain a phenomenon occurring around the human life; in brief science is all around us.

The experts shared how Japanese teachers did science learning. In Japan, teacher usually begins learning process by giving phenomena occurred around the students' lives so that students are encouraged to be bound with the lesson.

The topic that was chose to bring out implementation of scientific approach was corrosion



of ironed nail. At the experiment, Japanese teacher provided two test tubes that have been filled with iron nails. The first tube was filled with water, while the second tube filled with salt water. The tubes which are filled with iron nails and water would be used as a control variable. The aim of this experiment was to compare velocity of corrosion between control variable and ironed nail in second tube. Comparing is one skill which could develop by implementing scientific approach. From this experiment pupils would be able to conclude that salt water would increase the corrosion velocity of iron.

Accomplishing scientific approach to develop scientific thinking skill in order to increase Indonesian human resources quality will be not easy but it doesn't mean unattainable.

Being professional teacher would not be achieved instantly. Being a teacher means being a leader. A teacher will be the decision makers in many occasions such as determining the learning process in class. He/she will be the person who could invite students to be active or passive learners. All authority is in a teacher. Positioning his/herself as a student will help him/her in designing a lesson so that pupils will be more engage in learning process.

#### 4 CONCLUSION

Thee cycle of lesson study science team has enlightened science team in planning, implementation, and evaluateing learning stage. As a teacher, it is important to think the students' responses in order to make predictions and anticipation in planning class activities. Although the responses which come out from students could be different with the predictions, at least teacher knows how to respond them. This helps teachers to guide students in order to achieve learning objectives.

A teacher needs to test the media in "planning" session before asking students to conduct experiment using the media. This stage helps teacher to know the obstacle that will be experienced by students in the class room during the experiment.

The presence of control variables in a science experiment is important for students to build observations and thinking skill by comparing and finding the difference of the object that being observed.

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## Teachers As Researchers Through Lesson Study: Lessons Learned In Developing Students Understanding Of Character Traits In The Singapore Primary English Curriculum

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**Abstract:** Over the last 5 years, North Vista Primary School (NVTPS) has made use of lesson study as a way to develop teachers professionally. The school propagates the notion of Community of Learners which is undergirded by the view of the child as protagonist; the teacher as researcher; the environment as third teacher and parents/community as partners. This presentation reports on the learning experiences of a Primary One Team in the school involving 10 teachers, who used lesson study to mediate curriculum innovation to enhance student learning in the English Language. Through lesson study, the team was engaged in exploring curriculum innovation to enhance the Shared Book Approach (SBA) to deepen children’s understanding of the characters in the fictional texts. The presentation will involve the sharing of the teachers’ learning through the process of working together through two consecutive cycles of collaborative planning, research lessons and post-lesson reflection.

### 1 INTRODUCTION

#### 1.1 About Stellar

Strategies for English Language Learning and Reading, or STELLAR, is a national programme for helping Singapore children improve their language and learning through the provision of standardised guides and materials. The three teaching strategies used in lower primary are the Shared Reading Experience via Shared Book Approach (SBA), the Shared Writing Experiences via the Modified Language Experience Approach (MLEA) and Language activities in Learning Centres via Learning Centres (LC) (Figures 1 & 2). As part of the Shared Book Approach, the teacher uses a Big Book in class to engage children and model reading aloud. Through questioning techniques, the teacher will get the children to respond to the books while also teaching grammar, vocabulary, punctuation and concepts of print.



Figure 1. Three teaching strategies used in lower primary in STELLAR Programme (Ministry of Education Singapore, 2008)

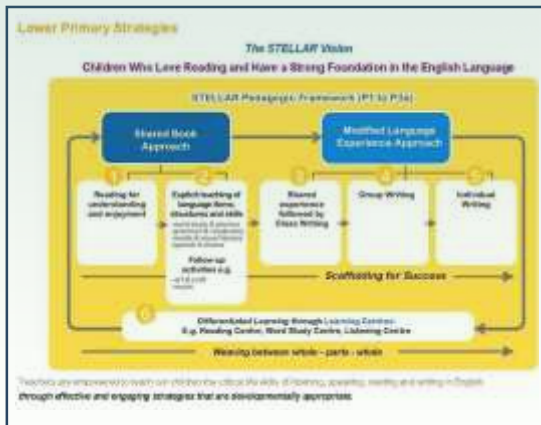


Figure 2. STELLAR Pedagogic Framework (Ministry of Education Singapore, 2008)

### 1.2 The Lesson

Currently in English curriculum for Primary level, students are required to come up with reason, rationale or justification for their choice of adjectives to study a character. This is parallel to the Ministry of Education English Language Syllabus for primary schools which states that under the section on ‘Text Response’, students are expected to identify and study characters and their actions. A pre-test was conducted and it was found that many students were able to communicate the adjectives (character traits) used on a character but failed to clearly and correctly state the reason to support their answers. As such, the team wanted to come up with strategies to improve students’ ability to identify correct character trait and give suitable reason for the choice of character trait. The team leveraged on our school’s readers’ workshop structure to promote literacy.

### 1.3 Readers’ Workshop

The Readers’ Workshop in North Vista Primary School provides our students with a supportive environment that involves them in an authentic reading experience that focuses on their strengths and needs of individual student, teachers modelling reading behaviours, providing direct instructions that focuses on acquisition of text specific comprehension skills and strategies through a process of mini-lesson, group and individual work (Figure 3). One of the outcomes of this lesson is for students to apply critical reading and viewing by focusing on implied meaning, higher order thinking, judgement and evaluation.



Figure 3. North Vista Primary School, Readers Workshop

The team decided to integrate the STELLAR Pedagogic Framework (Figure 2) to our school Readers’ Workshop as one of the strategies to augment students’ learning. The team decided to include a concept map to scaffold their learning on the book read in the Shared Book Approach (SBA). SBA is conducted in two parts, SBA 1 and SBA 2. During SBA 1, pupils are first introduced to a Big Book title to read for understanding and enjoyment. It is at SBA 2 that we start the explicit teaching of language items, structures and skills.

## 2 METHOD

The objective of the study was to teach pupils how to aptly describe a character in a book with an adjective (character trait) and provide reason, rationale or justification for their choice. The overarching goal that we want to see is that our students will become confident writers, to translate reading into writing skills.

### 2.1 Subjects

The lesson was conducted within 60 minutes. It was conducted in two primary one classrooms of 30 students each. There were 30 pupils of mixed abilities in each classroom.

### 2.2 Procedure

In formulating relevant ideas for the lesson planned, the teacher used concept map to elicit responses from students and build their semantic knowledge on the topic discussed. It served as a visual organiser that enriches students’ understanding of the topic discussed and helped them to organise new

information too. In this study, we used a Big Book entitled “Smarty Pants” by Joy Cowley.

The current practice in SBA1 is to ask questions verbally based on the cover of the Big Book and to make predictions. But what we added in was the use of concept map. In SBA1, before introducing the new Big Book entitled “Smarty Pants”, teachers elicited personal responses from pupils and furnished the concept map on ‘Clown’ (Appendix3). Students were then shown a short video on a clown’s performance. The teacher then got students’ responses about clowns based on the video shown and built on the concept map.

In SBA2, where the focus of the lesson plan was on, the research teacher started off with re-reading of familiar Big Book, ‘Smarty Pants’. The teacher proceeded with the explicit teaching of the lessons by asking questions to scaffold pupils understanding by eliciting the character traits of the main character in the book who is Smarty Pants. The teacher adopted the strategy “I-do. We-do. You-Do” which was originally created by Pearson & Gallagher (1983) in their Gradual Release Model framework. In this framework, there is a gradual release of responsibility model of instruction from the teacher to the students. (Do refer to the lesson plan in Appendix1 for detailed steps and list of questions asked during the lesson). At the end of the lesson, students were to complete a worksheet individually (Appendix4).

### 2.3 Post Cycle 1 Observation and Refinement

Some observations were made after the first cycle. Firstly, the teacher’s questioning techniques played a vital role in scaffolding students’ understanding of the book read and these were clearly exhibited. Secondly, it was noted that some students were able to state the actions of the character but due to lack of vocabulary, they were not able to use the accurate character traits. There were also students who were able to state the character trait of the main character but were not able to give accurate evidence from the book to support their choice. It was agreed upon during our post conference that students could be supported more to help them see the link between the actions and character traits used to describe it.

As we found it was necessary to revise some of the guiding questions in the lesson plan for Cycle 2, we decided to include differentiated instructions and

worksheets for that lesson. Students were also shown two more examples (outside the storybook context) to provide better understanding on the matter. The weaker students needed to be supported by exposing them to different character traits so that they could build up their vocabulary. Therefore, after reading a story students were asked to describe what each of the characters was “really like” and the teacher creates a chart of the students’ response (Manyak, 2007). This brain storming process prompts students to analyse the characters and provide the teacher with a rich context in which to teach new vocabulary. Thus, the teacher adopted an anchor chart to record the character traits from the students. The teacher had introduced this anchor chart in everyday discussion in class prior to Cycle 2. Students built up on the chart together as a class. As for the better students, they could be stretched further to infer what could the character be thinking or how he` was feeling, even though those are not stated in the story. The worksheets prepared were of varied difficulty level to suit the students’ abilities.

The team also decided to use of multiple IWBs to allow the research teacher to teach multi-sensory and multi-model style of lessons which will allow pupils to see the connection between the character and the word describe them. This style of teaching is closer to the multimedia world within which the students live and as such produces a heightened level of engagement in students (Beeland, 2002). ICT was infused in Cycle 2 also to promote collaborative and self-directed learning. This could be achieved by using the immersive living classroom. The immersive living classroom consists of 4 connected interactive walls.

In this cycle too, learning intentions of the lesson and success criteria were clearly displayed in one of the 4 panels. Sharing learning intention and success criteria is an essential part of assessment for learning as it helps students to take responsibility for their own learning and assessment (Smith, 2007). This was also for students to check their learning itinerary for the lesson. At certain points during the lesson, students were brought back to check their understanding and learning against the success criteria listed.

The use of immersive living classroom also enabled distinct differentiated instructions and activities to take place so that learners of different abilities could benefit fully from the lesson conducted, besides having differentiated worksheets. It also enhanced 21CC and teaching and learning experiences both for the teacher and students respectively.

Revised lesson plan for Cycle 2 is in Appendix2.

### 2.3 Post Cycle 1 Observation

Based on the observation during Cycle 2, students were seen to have learnt better with clearer instructions given. Students were fully engaged in student-centred activities using the immersive living classroom which also brought about self-directed learning. It was also observed that as in Cycle 1, teacher’s questioning techniques had helped the students to scaffold their thinking to make learning more meaningful for them. The inclusion of the two other examples in the teaching slides (Appendix 11) provided clearer examples to the students to match the correct character trait to the evidence given, scaffolding students’ learning even more.

Teacher observers agreed that the use of the anchor chart helped the students a lot especially the lower achieving pupils. They were able to refer to it and chances of them recognising the character traits were higher.

There were also differentiated worksheets prepared for each group (Appendixes 6, 7&8), which the students did after they had their hands on the activities on the panels.

## 3 ANALYSIS

ICT has a particular role to play through supporting dynamic and multiple representations of information. Collaboration around ICT activities has been shown to have the potential to increase pupils understanding and interest in the character study lesson.

Pre-tests and post-tests were administered before and after both cycles. Students’ responses in the tests of the two classes were analysed at the end of the intervention to evaluate the impact of the character study.

As indicated in Table 1, the pre-test mean scores of the two classes were 1.32 and 1.29. For the post-test, the students in the two groups scored 2.41 and 2.29 respectively, both of which are higher than the pre-test.

### 3.1 Results

Table 1. Comparison of results Pre and Post Test

	n = 30		n = 30	
	Pre-test	Post-test	Pre-test	Post-test
Mean score	1.32	2.41	1.29	2.29
Difference in mean scores	1.09		1.00	

Thus, both classes showed marked improvements of 1.09 and 1.00 in their mean scores.

Table 2. Differences in Improvements in Post Test Scores

Classes	No. of Students who showed improvements	Percentage
A	22 out of 30	73.3 %
B	21 out of 30	70.0 %

As shown in Table 2, more than 70% of the students in each of the classes improved their total scores in the post-test as compared to the pre-test. By sampling their answers, the project team also discovered that the intervention strategies were effective in helping them to better understand the character study especially in linking the character study to the reasons.

## 4 DISCUSSION

Based on the above results, using various strategies to teach character study and justifying the character trait of their choice to the evidence found in the story, has shown some improvement in their power of reasoning and writing skills. In the course of the intervention, they were taught the logic of their answers and to substantiate their character traits answers with facts. This approach worked well for the Higher Achieving (HA) and Middle Achieving (MA) groups but did not work as well for the Lower Achieving (LA) student group. For the latter, they need to have a better vocabulary to improve on their reasoning.

Although the project cycle had completed, the teachers felt that their adoption of effective questioning techniques through differentiated instructions to guide students has helped them to become more successful writers. A teacher felt that with the use of higher cognitive questions, coupled with longer wait-time given to the students, they were able to give more in-depth responses. Teachers felt the “I do, We do, You do” lesson framework had helped the students to have more confidence in answering the character trait questions. In short, the strategies used had enabled the teachers to understand the pupils’ metacognition and guide them in their thinking and reasoning more systematically.

## 5 RECOMMENDATIONS

The scope and depth of the lesson plan and the resources can be improved further. In Cycle 2, the order of the questions in the worksheets for MA and HA students should be paid attention to. The MA students dutifully started off by drawing the picture required in question 1 (See Appendix7). Thus, observation on how the MA students perform after the explicit teaching could not be recorded.

With regards to the use of character trait anchor chart, teachers should keep the end goal in mind. The elicitation of words to build up the anchor chart should take into account the character traits which could be used to describe the character, Mr Smarty Pants. Alternatively, teachers could use the words in the anchor chart to craft the sentences used in the activity sheet. This process could be tightened to facilitate the scaffolding.

In LA students' worksheet, it was observed that the students could do the task (Appendix6) by looking at the contextual clues instead of using their understanding based on the lesson just taught. They could be further stretched by asking them to use colour coding to identify the actions and the character traits on the same worksheet.

As for the HA students' worksheets, teacher observers agreed that there was a broken link as the activity done on the interactive wall did not complement the worksheets given to them even though they were able to accomplish the task on the interactive wall. Choice of passages used should be longer so that the HA students could draw inference from the contextual clues to conclude something about the character traits rather than them given 2 passages with five characters in them. All those being said, it is recommended that the time frame for intervention be increased so students can be assigned more practice exercises in describing character traits of increasing level of complexity.

## 6 CONCLUSION

This project shows that scaffolding students understanding of the character trait has indeed helped the Primary 1 students especially the HA and MA to express the character traits with correct supporting reasoning or evidences. Differentiated instructions and questioning techniques can also motivate passive learners to be more proactive and participative in their own learning. The strategies used in this intervention have proved to be effective and will continue to be adopted in the school's Reader's Workshop to complement the STELLAR programme.

## 7 REFERENCES

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Appendix 1

**Lesson Plan  
Cycle 1**

Date : 25 April 2014  
 Time : (45 minutes)  
 Teacher / Class : P1

**I. Goal of the Lesson Study Group:**

To develop confident readers and writers who are able to describe a character using character traits and say why it is so.

**II. Lesson Information**

**Name of the unit / lesson** : Smarty Pants / Grammar Period

**Lesson Objectives** : To describe character using an adjective and state why it is.

**Key Student Outcomes** : Pupils should be able describe a character using an adjective and state why it is so.

**Lesson Description :**

Steps of the lesson : learning activities and key questions (time allocation)	Anticipated Student Responses	Points of evaluation	Resources
<p><b><u>Re-Reading of a Familiar Big Book (5min)</u></b>                      Re-Read ‘Smarty Pants’</p> <ul style="list-style-type: none"> <li>- Tr to read the book together with pupils.</li> <li>- At the end of the reading, tell pupils that they are going to study the characters of Smarty Pants further and build upon the concept map that they have done earlier.</li> </ul>		<p>Are the pupils familiar with the story/Smarty Pants? How can you tell?</p>	<ul style="list-style-type: none"> <li>• Big Book – Smarty Pants</li> <li>• Notebook Ver.</li> <li>• Notebook Ver - Concept Map</li> </ul>

<p><b>Grammar Lesson (20 min)</b> <u>Explicit Teaching</u> <u>Tr Modelling (I-Do)</u></p> <p>Show pupils picture from Notebook – Cycle 1 p2</p> <p><u>Teacher to ask leading questions</u> Tr:Who have seen a racing event before? Where? Tr:Do you know the names of any car racers? Tr:What do you think of people who enjoy racing?</p> <p>Furnish the concept map based on pupils’ input.</p> <p><u>Explicit Teaching</u> <u>Tr Modelling (I-Do)</u> Tr:Today we are going to study Smarty Pants’ characters and try to support our answer with an evidence from the story. Tr:I think Smarty Pants is adventurous. <i>Write on the board and verbalise the sentence.</i> <i>Write ‘adventurous’ on the Concept Map</i> Tr:Smarty Pants is adventurous because he</p>	<p>Ppl: Singapore</p> <p>Ppl: Hamilton, Fernando Alonso</p> <p>Ppl: crazy / adventurous / brave</p>	<p>Are pupils able to relate the picture stimulus with what they know (prior knowledge)?</p>	<ul style="list-style-type: none"> <li>• Notebook File - Cycle 1 Smarty Pants (pp2 &amp; 3)</li> <li>• Butcher paper for Tr to write sentences on.</li> <li>• Notebook File - Concept Map</li> </ul>



<p>enjoys driving a fast car.</p> <p>Tr:I think Smarty Pants is brave.</p> <p><i>Write on the board and verbalise the sentence.</i></p> <p><i>Write ‘adventurous’ on the Concept Map</i></p> <p>Tr:Smarty Pants is brave because he is not afraid of racing in a fast car.</p>			
<p><u>Explicit Teaching</u> <u>Pupil Practice (We-Do)</u></p> <ul style="list-style-type: none"> <li>• Show pupils picture from Notebook file – Cycle 1 p3</li> <li>• Get pupils to think of adjectives to describe Smarty Pants.</li> <li>• Build up the concept map as pupils give their responses.</li> <li>• Ask pupils to give reason to their answers.</li> <li>• Record pupils’ responses on the board, unedited.</li> <li>• Record responses from 2 pupils.</li> <li>• Return to the sentences contributed and edit them as a class. Bringing back ppls’ attention to the first sentence modelled by teacher. “<i>Smarty Pants is _____ because he _____.</i>”</li> </ul>	<p>talented / irresponsible / unthoughtful</p> <p>Smarty Pants is talented because he can play the trumpet well.</p> <p>Smarty Pants is unthoughtful because he plays the trumpet too loudly.</p>	<p>Do pupils understand that a <u>positive</u> adjective of quality must be supported by a <u>positive</u> interpretation of the evidence from the story?</p> <p>Do pupils understand that a <u>negative</u> adjective of quality must be supported by a <u>negative</u> interpretation of the evidence from the story?</p>	<ul style="list-style-type: none"> <li>• Notebook File - Cycle 1 Smarty Pants</li> <li>• Notebook File – Concept Map</li> <li>• Butcher paper for Tr to write sentences on.</li> </ul>
<p><b><u>Evaluation (15 min)</u></b></p>		<p>Did the pupils</p>	

<p><u>Individual Practice (You-Do)</u> Tr: Now that we have read and known more about Smarty Pants, I want you to tell me what YOU think about Smarty Pants and give me the reason why you think that is so.</p> <p>Show pupils the worksheet (with the cover picture of Smarty Pants)</p> <p>Explain to pupils that they are supposed to fill in the blanks with one appropriate character trait and state the reason why they say so. Tell them to use the structure shown earlier.</p> <p>Show pupils pictures from Notebook file – Cycle 1 p4.</p> <p>Write-Pair-Share. Give pupils 10 minutes to complete the worksheet. (Set Notebook timer)</p> <p>Then they pair with their partners and share what they have written. Get 1 or 2 pupils to share what they have written. Elicit responses to edit their sentences if necessary.</p> <p>Leave the concept map on the board.</p> <p>Leave teacher-modelled sentence on the board.</p> <p>Leave the edited sentences from pupils’ responses on the board.</p>		<p>understand what would be in the first blank (adjective of quality)?</p> <p>Did any pupils use more than one adjective (unthoughtful and irresponsible)? Examples.</p> <p>Were the pupils able to fill in the second blank with appropriate reasons? What was the difficulty, if any?</p>	<ul style="list-style-type: none"> <li>• Post-Evaluation Worksheet</li> <li>• Notebook File – Cycle 1 p4</li> </ul>
<p><u>Closing (5 min)</u> Re-cap briefly the lesson just taught.</p>		<p>Did the pupils understand the importance of giving relevant</p>	

<p>State that one must answer questions in complete sentences and give relevant reasoning to the answer.</p>		<p>reasoning to support the character trait they have described?</p>	
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Appendix 2

**Lesson Plan  
Cycle 2**

Date : 25 May 2014  
 Time : (60 minutes)  
 Teacher / Class : P1

**I. Goal of the Lesson Study Group:**

To develop confident readers and writers who are able to describe a character using character traits and say why it is so.

**II. Lesson Information**

**Name of the unit / lesson** : Big Book Title – ‘Smarty Pants’  
**Lesson Objectives** : To describe character using an adjective and state why it is.  
**Key Student Outcomes** : Pupils should be able describe a character using an adjective and state why it is so.

**Learning Intention**

We are learning to use describing words to talk about a person in the story.

**Success Criteria**

1. When I look at the picture, I can describe the actions of the character.
2. Looking at the actions, I can describe the character.
3. I will be able to give a reason why I use the word to describe the character.

**Lesson Description :**

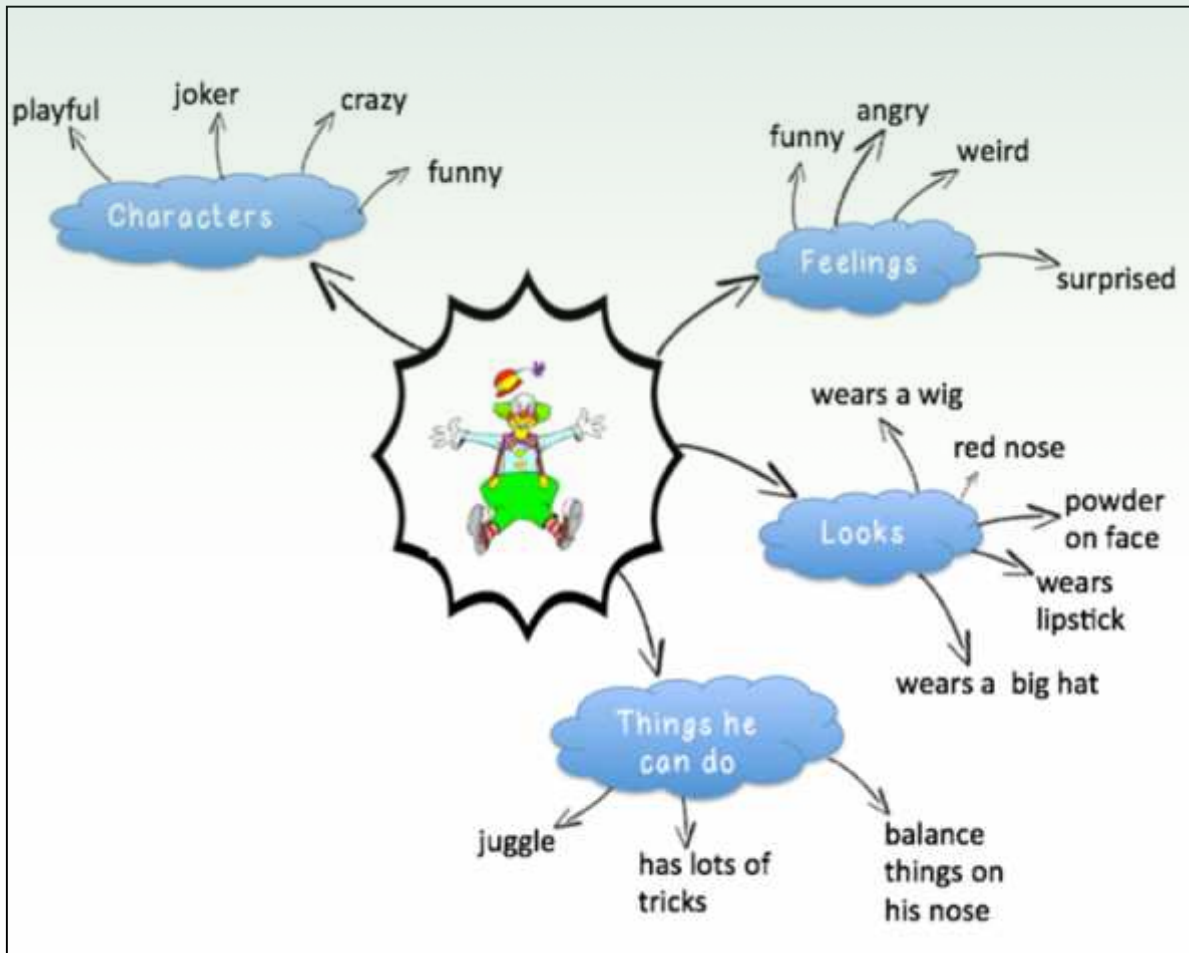
Steps of the lesson : learning activities and key questions (time allocation)	Anticipated Student Responses	Points of evaluation	Resources / Smart Board Support
<p><b><u>Tuning-In (5 min)</u></b></p> <p>Use Think-Pair-Share to get pupils think of a character trait to describe their classmates.</p> <p>Get 1 or 2 pupils to do sharing. Tr to update Character Traits Anchor Chart (CTAC) accordingly.</p>			<p>Character traits anchor chart (CTAC)</p>
<p><b><u>Re-Reading of a Familiar Big Book</u></b></p> <p>Re-Read ‘Smarty Pants’</p> <ul style="list-style-type: none"> <li>- Tr to read the book together with pupils.</li> <li>- At the end of the reading, tell pupils that they are going to study the characters traits of Smarty Pants (SP) further and build upon the anchor chart that they have done earlier.</li> <li>- Bring the pupils’ attention to the Panel#1 – Slide1 on Learning Intention and Success Criteria.</li> </ul>		<p>Are the pupils familiar with the story/Smarty Pants? How can you tell?</p>	<ul style="list-style-type: none"> <li>• Big Book – Smarty Pants</li> <li>• LvgClrm Panel#3 – Slide1 onwards (SP Book)</li> <li>• Character traits anchor chart (CTAC)</li> <li>• LvgClrm Panel#1 – Slide1 (Learning Intention and Succ. Cr.)</li> </ul>
<p><b><u>Main Lesson (30 min)</u></b></p> <p><b>Part 1</b> <b>Tr Modelling</b></p> <p>Show pupils pictures on pp. 2 and 3</p> <p><u>Teacher to ask leading questions</u> Tr: What do you think SP is trying to do?</p> <p>Tr: Who have seen a racing event before? Where?</p>	<p>Cars Movie Speed - Ride bicycle - PE Lessons</p>	<p>Are pupils able to relate the picture stimulus with what they know (prior knowledge)?</p> <p>Doing? Feeling? Say? What can we say about</p>	<ul style="list-style-type: none"> <li>• LvgClrm Panel#3 – Slide1 onwards (SP Book)</li> <li>• LvgClrm Panel#4 – Slide 1 (Discussion Template)</li> </ul>

<p>Tr: Do you know the characters in the Movie?</p> <p>Tr: How do you think he is feeling? What do you think he is saying?</p> <p>Address pupils' responses accordingly. Teacher is to repeat appropriate responses from pupils to conclude the accurate describing word (adjectives) about the character traits of SP. Teacher to record this response on the board and to update the word on CTAC.</p>		<p>SP's character?</p>	
<p><b><u>Main Lesson (Vocabulary)</u></b></p> <p><b>Part 2</b> <b>**AFL**</b></p> <p>Show pupils picture on pp. 8 and 9 (swimming)</p> <p><u>Teacher to ask leading questions</u> Tr: What is SP doing?</p> <p>Tr: How do you think he is feeling? What do you think he is saying?</p> <p>Tr: What kind of person can you say SP is?</p> <p>From students responses, use “Find the fib” to lead pupils to get the most accurate describing words to the actions (feeling/saying) presented.</p> <p>Tr to write the options on the board using options ‘1’, ‘2’ and ‘3’. Pupils analyse and decide on their choice by showing their fingers to correspond on their</p>	<p>Funny / Silly / Smart</p>	<p>Assess pupils using TLC strategies.</p> <p><b>**AFL**</b> Learning Intention -Use describing words to talk about a person in the story</p> <p><b>Success Criteria</b></p> <ol style="list-style-type: none"> <li>1) Look at the picture and describe the action</li> <li>2) Look at the action and describe the character</li> <li>3) Give reason why the character trait fits (SP)</li> </ol> <p>Show picture(Success Criteria) Action Describe Reason</p>	

<p>choice.</p> <p>Address pupils’ responses accordingly.</p> <p>Teacher to record this response on the board and to update the word on CTAC.</p>			
<p><b><u>Main Lesson (Vocabulary)</u></b></p> <p><b>Part 3</b> <b>Class Practice</b></p> <p>Show pupils picture on pp. 6 and 7 (blowing a trumpet)</p> <p><u>Pupils to think of the leading questions</u> 1 : What do you think SP is trying to do?</p> <p>2 : How do you think he is feeling? What do you think he is saying?</p> <p>3 : What kind of person can you say SP is?</p> <p>Get 1 or 2 pupils to share their answers.</p> <p>Tr to address pupils’ responses accordingly.</p> <p>Tr to record this response on the board and to update the word/s on CTAC.</p>	<p>blowing a trumpet</p> <p>happy / excited</p> <p>talented /</p> <p>irresponsible /</p> <p>unthoughtful</p>	<p>Do pupils understand that a <u>positive</u> adjective of quality must be supported by a <u>positive</u> interpretation of the evidence from the story?</p> <p>Do pupils understand that a <u>negative</u> adjective of quality must be supported by a <u>negative</u> interpretation of the evidence from the story?</p>	<p>Collage of pictures -Small books</p>
<p><b><u>Evaluation (10 min)</u></b></p> <p><b>Individual Practice</b></p> <p>Tr: Now that we have read and known more about Smarty Pants, I have prepared different work for different groups of pupils.</p> <p><b><u>HA:</u></b></p>			<p>HA: Annex 1</p> <p>MA: Annex 2</p> <p>LA: Annex 3</p> <p>LA – Matching on the</p>

<p>From the collage of pictures on the SmartWall, pupils are to select a picture to describe a character trait of SP. They are required to furnish a worksheet. They are also required to write a full sentence (by themselves) the character trait of SP and the reason as to why it is so.</p> <p><b>MA:</b> From the collage of pictures on the SmartWall, pupils are to select a picture to describe a character trait of SP. They are required to furnish a worksheet.</p> <p><b>LA:</b> Pupils are to attempt to match character traits to possible reasoning on the SmartWall. Then they are to conclude what they think about SP by using a describing word.</p>			<p>Interactive Wall Self Check Worksheets – Matching by drawing lines</p>
<p><b><u>Closing (5 min)</u></b></p> <p><b>**AFL**</b></p> <p><b><u>Student Summary</u></b> Get a student to summarise what the whole class has learned during the lesson. Tr to use random picker flash on Panel#3-Slide 10.</p> <p><b><u>Be the Teacher</u></b> Verbally get pupils to say what the learning intention should be for the next lesson.</p>		<p>Did the pupils understand the importance of giving relevant reasoning to support the character trait they have described?</p>	<ul style="list-style-type: none"> <li>• LvgClrm Panel#3 – Slide 10 (Random Picker)</li> <li>• LvgClrm Panel#4 – Slide 1 (Discussion Template)</li> </ul>

Appendix 3



*Concept map used in Cycle 1*



Appendix 4



North Vista Primary School  
Primary 1 English Practice Sheets  
Smarty Pants

Name: \_\_\_\_\_ ( ) Class: Primary 1/ \_\_\_\_\_  
Date: \_\_\_\_\_

**Readers' Workshop (Character Study)**

**SMARTY PANTS**

I think Smarty Pants is a \_\_\_\_\_ person because \_\_\_\_\_

\_\_\_\_\_

Illustrate by drawing what he did in the book.

*Cycle 1 Worksheet*

Appendix 5

Cycle 2 - Lesson Study 16May2014-1 2.notebook

October 24, 2014

**Learning Intention**

We are learning to use describing words to talk about a person in the story.

**Additional Objectives:**

- When I look at this slide, I can describe the action of the character.
- Looking at the action, I can describe the character.
- I will be able to give a reason why I use the word to describe the character.

**Think - Pair - Share**

**You + Me = Friendship!**



**time to share**




**Character Traits**

loving	lazy
cheerful	short
helpful	funny
attentive	happy
awesome	excited
naughty	
clever	

**Character Traits**

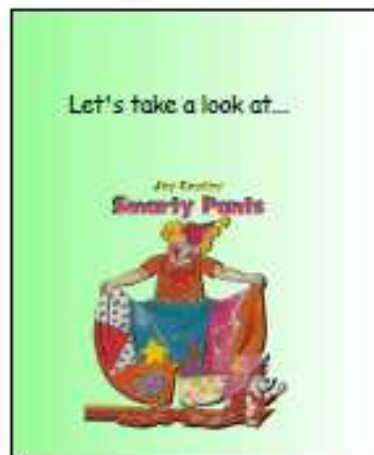
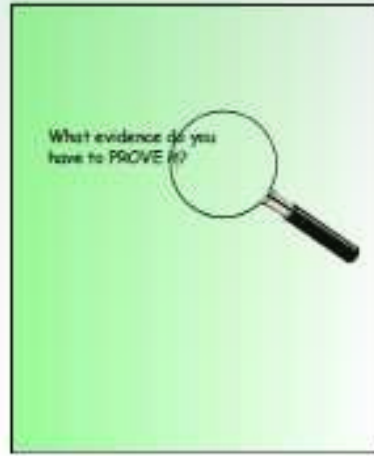
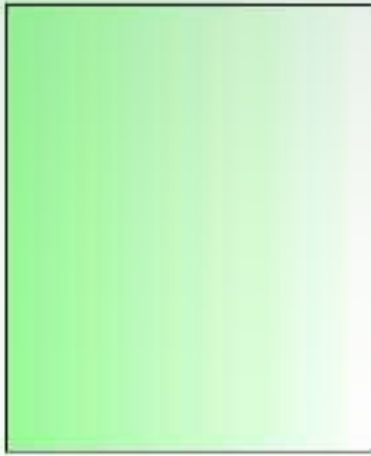
**Reading Time!**



Cycle 2 Teaching slides

Cycle 2 - Lesson Study 16May2014-1 2.notebook

October 24, 2014



Cycle 2 Teaching slides

Cycle 2 - Lesson Study 16May2014-1 2.notebook

October 24, 2014



Actions	Words	Feelings



Actions	Words	Feelings





Read the following carefully, then match the illustrations with their behavioral state on the next page.

The match was on! The girls cheered and looked ready for anything. Goals were flying as the match flew on. The crowd went wild and each player was praised by the crowd. It was a tie. The final result of the year was a tie.

Girls congratulated the girls who scored in the goal. Another girl flew her team to victory. They had played well because for another team, the final goal from the game struck the team.

Cycle 2 Teaching slides

Appendix 6



Name : \_\_\_\_\_  
Class : P \_\_\_\_\_

Date : 16 May 2014



Match each picture to the appropriate character trait and its reason.

Smarty Pants is ....



daring because he is not afraid to fall when he swings in the jungle.



a nature lover because he flies the aeroplane to see the world.



fun-loving because he enjoys doing fun stuff like skiing.




smart because he uses his pants to float on water.




talented because he can blow the trumpet.

Appendix 7



Name : \_\_\_\_\_  
Class : P \_\_\_\_\_

Date : 16 May 2014




Draw a picture that best describes the character trait that you have chosen below.

Actions	Words	Feelings

Character Trait


Cycle 2 Worksheet – Middle Ability (MA) group

Appendix 8



Name : \_\_\_\_\_  
Class : P \_\_\_\_\_

Date : 16 May 2014



Draw a picture that best describes the character trait that you have chosen below.

Actions	Words	Feelings

Character Trait

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Cycle 2 Worksheet – Higher Ability (HA) group

Appendix 9

The screenshot shows an interactive wall interface. At the top left, there are two green buttons labeled "Edit" and "Reset". To the right of these buttons is a red progress bar with the number "56" in white. In the top right corner, there is a green circular button with a white question mark and a small yellow padlock icon. The main area of the wall displays six brown circular tiles with white letters: "e", "a", "n", "t", "u", and "r". Below the tiles, the text reads: "Smarty Pants is a \_\_\_\_ lover because he flies the aeroplane to see the world." At the bottom left of the main area, there is a green button labeled "Clue". At the bottom center, there is a blue link labeled "Extend Page".

*Anagram – Middle Ability (HA) group’s activity on the interactive wall.*



Appendix 10

Read the following carefully, then match the characters with their behavioral traits on the next page.

The match was on! Alex strode forward and looked ready for anything. Kaelie was fidgeting as she awaited her turn. The card was pulled and both students answered at the same time. It was a tie! The final mach of the year was a tie!

Carlos congratulated the girls and returned to his seat. Jasmine high-fived her team-mates. Billy Bob groaned and shouted for another turn, he then sat down and glared around the room.

Read the short story given to you and as a group, match the Characters below with the character traits

Name	Trait with Proof
<input type="text"/>	Confident because he was ready for his turn. <span style="float: right;">Billy Bob</span>
<input type="text"/>	Disappointed because he groaned. <span style="float: right;">Kaelie</span>
<input type="text"/>	Nervous because she was fidgeting. <span style="float: right;">Jasmine</span>
<input type="text"/>	Good sport because he congratulated the girls. <span style="float: right;">Carlos</span>
<input type="text"/>	Cheerful because she high-fived her teammates. <span style="float: right;">Alex</span>

Appendix 11

Example:

Joe's friend, Tom, laughed a lot. He always had a smile on his face. Tom was a \_\_\_\_\_ person.

Angry                      Happy  
NAUGHTY

Extra-1-P-10

Example:

Tippy had a bone. A bigger dog wanted it. Tippy was afraid. She stood over her bone and barked. The big dog ran away. Tippy was glad she hadn't lost her bone.

proud scared brave shy

*Cycle 2 – Extra examples shown in Cycle 2*

## Programmed Assistance With Lesson Study In Mathematics Learning In Junior High School Based On The Curriculum 2013

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**Abstract:** The Curriculum 2013 will be applied to all grade levels at every educational institution. However, not all teachers get a learning training based on the curriculum 2013. The main problem in this research is how the programmed assistance with Lesson Study in mathematics learning in Junior High School based on the Curriculum 2013. The research approach used in this study is qualitative approach. The research subject is math teachers in Muhammadiyah Junior High School in Semarang City who have never received any training of the Curriculum 2013. The results of the research are that (1) it could describe the ability of the math teachers in planning, implementation, and assessment of mathematics learning based on the curriculum 2013, (2) it obtained various models of lesson plan and learning media based on the curriculum 2013, and (3) it described the barriers to the implementation of the Curriculum 2013 in Muhammadiyah Junior High School in Semarang City in mathematics learning.

**Keywords:** Implementation of the curriculum 2014, Mathematics Learning, Lesson Study.

### 1 INTRODUCTION

Education has important role in human life since it determines the development and character of human. Whether a nation is well developed or less developed could be seen from the development of its education. A nation which has good education would results people with good character and civilized. One of the factors determining the education direction of a country is the school curriculum.

Curriculum as an education planning has a central position in all education activities. It determines the education process and result. Thus, constructing curriculum needs strong foundations so that the curriculum as the basis and purpose of education could be accountable.

Within a certain period, the Indonesian school curriculum always changes. The change aims to improve and to enhance the education quality in schools. One of the reasons of the change of Indonesian curriculum is based on the result of Trends in International Mathematics and Science Study (TIMSS) and Program for International Student Assessment (PISA) which are not satisfying. The report of TIMSS and PISA describe that in 2007 the Indonesian students were scored 397 which means that the ability of

Indonesian students in solving non-routine problems (mathematical problems) was very low. The next result of TIMSS in 2011 gave score of 386 for Indonesia. It means that the Indonesian students' achievement was not satisfying (Mullis, *et al.*, 2009; Mullis, *et al.*, 2012; Kemdikbud, 2014). This condition suggests that the Indonesian education particularly in mathematics field needs to be improved.

In 2013, the government of Indonesia converted the 2006 curriculum into the 2013 curriculum. The regulation of Indonesian Ministry of Education and Culture number 81A/2013 explains that the implementation of the 2013 curriculum shall be gradually implemented. The implementation in 2013/2014 academic year involved the selected schools. Then, all of schools in Indonesia would be involved in the implementation of the 2013 curriculum in 2014/2015 academic year.

Nevertheless, though the curriculum has been designed very well, the quality improvement would not be reached unless the teachers implement the learning based on the purposes given in the curriculum. According to Danim (2002), teacher has important role and is the key of education quality improvement success. Teacher should be ready to implement

learning based on the curriculum set by government.

Based on the result of interview toward the mathematics teacher of SMP Muhammadiyah 1 Semarang, we know that: (1) until May 2014, there are many new teachers in Muhammadiyah schools in Semarang City who have not joined the 2013 curriculum training; in fact, all schools are obliged to implement the 2013 curriculum start from July 2013, (2) there are teachers who have joined the 2013 curriculum training but they are less confident in practicing it, (3) in general, teachers find difficulties in doing the assessment based on the 2013 curriculum because the learning assessment is too complex.

The problems faced by mathematics teachers in Muhammadiyah schools in Semarang City in implementing the 2013 curriculum need to be solved. One of the ways to help teachers is using lesson study. Through lesson study, teachers collaborate to discuss the class based learning problems. According to Ylonen and Norwich (2013), LessonStudy facilitates the following: (1) collaborative opportunities to share knowledge and skills with colleagues, (2) sharing of risk in innovating about teaching and more willingness to learn from errors, (3) solidarity between teachers that affirms capabilities to innovate about lesson teaching, (4) dedicated time to reflect, plan and problem solve in a supportive public setting, (5) honest and constructive observations of research lessons to each other, (6) a micro-focus on the learning of 1-2 students to enable a greater depth of analysis, and (7) more awareness of their implicit teaching knowledge (practitioner knowledge). Dudley (2012) also suggests the same thing; lesson Study works successfully in a system that expects teachers and school leaders to improve professional knowledge and practice through systematic use of collaborative, and in query-based teacher learning approaches.

The organized guidance using lesson study in this research means that the teachers who have joined the 2013 curriculum training and those who have not join the training make a collaboration to design a learning, to implement, to observe, and to discuss the learning. This activity is scheduled such that each teacher will not abandon their duty to teach when they should gather to discuss the design, the observation, and the reflection of the learning.

Based on the background described above, a main research question can be formulized on how the organized guidance using lesson study helps junior high school mathematics teacher to

implement the 2013 curriculum. The main research question could be formulized for more detail into several research questions as follows: (1) how could the mathematics teachers' ability in constructing plan, implementing, and constructing assessment of mathematics learning based on the 2013 curriculum be described? (2) whatkinds of learning products could be produced in the organized guidance using lesson study based on the 2013 curriculum? and (3) what is the hindrance which may occur in the implementation of 2013 curriculum in junior high school mathematics learning in Semarang City?

The advantages of this research are: (1) teachers were assisted to implement the 2013 curriculum at school, (2) the learning problems could be raised in which the government could use them as a reference to build training program of 2013 curriculum, and (3) the learning products such as lesson plan and students' worksheet resulted from the teachers collaboration could be the model of learning device for the others.

## 2 METHOD

The approach used in this research was qualitative approach. Since this is a qualitative research, then the main research instrument is the researcher himself. Researcher was involved together with the research subject. The research subjects were mathematics teachers from 9 junior high schools in Semarang City.

The data in this research is qualitative data which was gained through observation, interview, and documentation. The observation was conducted during the lesson study, namely began with “Plan”, “Do”, and “See”. The interview was conducted in the end discussion of “Plan” and “See”. The document used in this research include all notes resulted from “Plan” and “See”, lesson plan, and students' worksheet.

The validity of the research data was confirmed through data triangulation. The triangulation aims to avoid any bias data resulted from the observation, interview, questionnaire, and documentation. This method was used to cross-check the data as well as to check the truth of the information gained before. The data analysis in this research used the plot of Mills & Hubbermen model(1984) which includes: (1) data collection, (2) data reduction, (3) data display, and (4) conclusion drawing/verifying.

### 3 FINDING AND DISCUSSION

The organized guidance using lesson study of the 2013 curriculum implementation was started by some mathematics teachers in Muhammadiyah junior high schools in Semarang City built work groups consisting of 4-5 teachers for each cluster. The work group consisted of teachers coming from the near schools each other. At least one of the members of each group should have joined the training of the 2013 curriculum implementation. The member who has joined the training has duty to guide his or her colleague to implement the 2013 curriculum in the planning, implementation, and assessment of learning.

Each team designed activities for “Plan”, “Do”, and “See” stages. The activities schedule was made based on the following rule: (1) for the first open class, the one who become model teacher would be those who have joined the 2013 curriculum training; the rest of member could be observer during the learning, (2) for the second and the third open class, the one who become model teacher shall be those who have not joined the training, and (3) the lesson plan, media, and students’ worksheet used in the open class were drafted by the model teacher and then discussed together in “Plan” activities with all members.

#### 3.1 Description of The Mathematics Teacher Ability In Constructing Lesson Plan

The first Plan activity was started by discussing draft of lesson plan built by model teacher who has joined the 2013 curriculum training. The material discussed in the first Plan activity was the Basic Competence 3.1: Comparing and ordering some integers and fractions as well as applying operation on integer and fraction by using various operation properties.

In the first Plan discussion, the teacher model shared a lot of his experiences on how to construct lesson plan based on the 2013 curriculum. While the other team members asked many questions about the core competence in mathematics subject. For instance, whether the first core competence (KI-1) and the second core competence (KI-2) are always included in the lesson plan, which was then answered “Yes” by the teacher model. Besides, the team discussed a lot about lesson plan format based on the 2013 curriculum. The result of the discussion is presented at the Table 1 below.

Table 1. Description of The First Lesson Plan Discussion

No	Aspect discussed	Discussion note
1	Lesson Plan Format	The first topic discussed was the format of the lesson plan. The solution of this topic could be gained by referring the attachment of regulation of the Ministry of Education and Culture Number 58/2014 about the lesson plan format.
2	The core competence (KI 1-4)	The discussion focused on how to implement the KI-1 dan KI-2 in mathematics learning which shall appear in all learning. The discussion agreed that all learning should accommodate the KI-1 and KI-2.
3	The indicator of the basic competence (KD)	The difficulty during the discussion was when they tried to construct indicators for KD within KI-4.
4	Learning Method/Approach	Discussing a lot about the scientific approach in designing the mathematics learning, since it deals with how mathematics should be learned through “Observing”, “Questioning”, “Associating”, “Experimenting” and “Networking/Communicating”
5	Learning Result Evaluation	This discussion in this step was not deeply conducted because the teacher model has not mastered some evaluation model which are suitable with the 2013 curriculum.

In general, the discussion in the first Plan activities was dominated by sharing activities from the model teacher who has joined the 2013 curriculum training, while the rest of the members asked about the components in the lesson plan, especially when they should design the mathematics learning.

The interview toward some team members who have not joined the training gave information that the difficulty in making lesson plan was on how to design observation activities for mathematics object using scientific approach. The other difficulty was on how to design students’ activities such that they could engage in reasoning activities. The difficulty in designing observation and reasoning activities happened among team members though some of them have joined training. Gersten (as quoted by Christin, 2011) suggested that knowledge about how to teach mathematics determine the innovation of

learning. Thus, if the teachers are less innovative then the lesson plan is difficult to be constructively developed.

The first Plan discussion has given a worth experience for every team member because they got real experience in planning a learning instead of just listening to a talk. All of team members showed strong spirit to analyze the implementation of mathematics learning in the scheduled open class.

The second Plan activity was started by discussing the lesson plan draft built by teacher who has not join the training of 2013 curriculum. The lesson plan draft was made based on the team experience in the first cycle after discussion in See activities. The second lesson plan was made by teacher model 2. The material was Basic Competence 3.2: Explaining the definition of set, subset, complement of set, operation of set, and showing the example and non example of the set.

Based on the reflection of the first cycle of See activities, things which should be concerned are: (1) the students' activities of observing, associating, and communicating about integer did not particularly emerge as the focus of the 2013 curriculum learning, (2) the mathematics object taught was still too abstract, (3) the assessment activities was not optimal in measuring every basic competence, and (4) it was too much showing power point presentation so that the students were passive. Based on the first cycle of See activities, the participants made lesson plan for the next learning. The improvement of the lesson plan is given in the following Table 2 below.

Table 2. Description of The Second Lesson Plan Discussion

No	Aspect discussed	Discussion result
1	Indicator of Basic Competence	The model teacher has not been perfect yet in constructing draft of lesson plan particularly in the indicator of basic competence. The indicator was then improved based on the team discussion.
2	Learning method/approach	The observing activity of set was design by observing set of things in the classroom. The students were asked to identify and to make list of the set of "things in the classroom which have three sides and four sides" by themselves.
3	Learning result evaluation	The learning evaluation was made in simple way so that it would not be complicated.
4	Learning media	Power point was chosen as learning

		media which function to confirm the definition of set and to show the worksheet.
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Based on the Table 1 and 2, it can be seen that there were changes of teachers' ability in constructing lesson plan. The second Plan discussion has focused on how the mathematics content should be and how to make the students learn by using scientific approach.

The third Plan activity was started by discussing the lesson plan draft constructed by the third model teacher who has not joined the 2013 curriculum training. The third lesson plan draft was made based on the experience in the first and the second cycle. The material for the third Plan was the Basic Competence 3.6 "Identifying the properties of plane figures and using them to determine its perimeter and area".

The discussion of the third Plan was based on the See discussion result of the second cycle. The discussion contents in the second cycle are: (1) teachers need to provide teaching aid to be used in the observation activities, (2) the evaluation made in the second cycle was too wide so that teacher was difficult to do authentic assessment; Thus, it was recommended to make the assessment instrument more detail for the next learning, (3) the students worksheet need to be made in simple way, and (4) the learning media would be better if it was not only power point, but also more various. The description of the discussion result of the third Plan activities is presented in the following Table 3 below.

Table 3. The Description of the Third Lesson Plan Discussion Result

No	Aspect discussed	Discussion result
1	Learning Approach	The learning design for observation activity of plane figures' properties should be focused on the media which have been prepared by teacher.
2	Learning Result Evaluation	The evaluation used: the instrument of spiritual assessment, instrument of social attitude assessment, instrument of self assessment, instrument of peer assessment, instrument of knowledge aspect, and instrument of skill aspect.
3	Learning Media	The learning media combined the power point, teaching aid, and students worksheet.

Based on the Table 3, the teacher discussion was not only in terms of pedagogy and content, but also about the learning evaluation. It shows that teachers have changed their mind set, particularly in designing the mathematics learning and assessment in the classroom based on the 2013 curriculum.

### 3.2 Description of The Teachers’ Ability In Mathematics Learning Based On The 2013 Curriculum

The first open class activity was started by model teacher who has joined the 2013 curriculum training. The material discussed in the first open class was the Basic Competence 3.1 Comparing and ordering some integers and fractions as well as applying operation on integer and fraction by using various operation properties.

The substances of the observation result in the first Do activities is presented in the following Table 4 below.

Table 4. Description of the First Open Class

No	Aspect discussed	Observation Result
1	The implementation of scientific approach	The students’ activities in observing integer was not clear, because the it happened only through power point. The students’ activities in associating the integer have not yet emerged.
3	The use of learning sources/media	Teacher showed power point media too much so that the students were passive.
4	The students’ involvement in the learning	The students were less active because the learning media less support the involvement of the students.
5	Closing Activities	Until the end of the learning, the assessment has not been conducted optimally in measuring each indicator of the basic competence.

Based on the Table 4, we know that though the model teacher in the first open class was the one who has joined the 2013 curriculum implementation training, the learning was not yet optimally conducted. However, based on the reflection discussion, the team members who have not joined the training agreed that they got a valuable experience from the good and the lack of the learning performance. The interesting thing is that the model teachers are more confident in teaching

based on the 2013 curriculum because they said it was not difficult as they thought.

The second open class was conducted by the model teacher who has not joined the 2013 curriculum training to implement the lesson plan which has been discussed in the second Plan activity. The material discussed in the second open class was the Basic Competence 3.2: Explaining the definition of set, subset, complement of set, operation of set, and showing the example and non example of the set.

The second open class used lesson plan based on the experience and reflection discussion in the previous open class. The observation result of the second open class is presented in the Table 5 below.

Table 5. The Description of The Second Open Class

No	Aspect discussed	Observation result
1	Opening activities	In the beginning, students were not enthusiastic to join the mathematics learning. After the teacher gave teaching aid, students started to pay attention and tried the teaching aid provided.
2	The implementation of scientific approach	The students noted the observation result based on various sources less systematically.
3	The use of learning sources/media	The power point learning media was interesting for students because of the variation.
4	The students’ involvement in the learning	Some students were not involved in using the teaching aid because the number of teaching aid provided was limited and it was dominated by the more creative students.
5	Learning result evaluation	The authentic assessment conducted by teacher was less done, so many students’ activities were not assessed.
6	Closing Activities	In the end of learning, there is no task for the students.

Based on the observation in the second open class, though the model teacher in this session has not yet joined the training of 2013 curriculum, he could implement many aspects within the 2013 curriculum. It shows that the collaboration activity through the Plan-Do-See activities (Lesson Study) was very much significant for the dissemination of the 2013 curriculum.

The third open class was also conducted by the third model teacher who has not yet joined the 2013 curriculum training. The material was the Basic Competence 3.6 “Identifying the properties of plane

figures and using them to determine its perimeter and area”. The third open class was conducted based on the lesson plan constructed in the third Plan activity.

The description of the third open class is presented in the Table 6 below.

Table 6. The Description of the Third Open Class

No	Aspect discussed	Observation result
1	Opening activities	The challenge in a form of quiz given by teacher was responded positively by students.
2	The implementation of scientific approach	The teaching aid in order to identify the properties of plane figures was challenging students to try, to observe, and to ask question.
3	The use of learning sources/media	Some students did not use the teaching aid directly because it was still dominated by the clever students.
4	The students' involvement in the learning	Some students were not involved actively because it was still dominated by the clever students.
5	Learning result evaluation	The evaluation process in terms of using authentic assessment could be implemented well. The lack is that some students were not assessed because they were not given chance by teacher.
6	Closing Activities	The confirmation activities given in the end of learning was interesting for students to sum up what they have learned.

Based on the Table 1-6, we know that the improvement and perfection of Lesson Plan impacts on the improvement of learning practices in the classroom. Through this lesson study activities, the teachers who have not yet joined the 2013 curriculum training could make the students learn well and were able to implement the learning based on the 2013 curriculum. The model teacher who has joined the training also gained many experiences from the learning practices in the classroom. This is suitable with the statement of Adedoyin (2011) who

stated that one of the characteristics of good teacher is having pedagogical knowledge.

### 3.3 Description of the Lesson Plan Models and Media Based on The 2013 Curriculum

Based on the “Plan” and “See” discussion result, we have various models of lesson plan. Table 7 below presentsthe difference among lesson plan constructed from the three cycles of the Plan, Do, and See.

Table 7. Various Model of Lesson Plan and Media

No	Component of Lesson Plan	Lesson Plan 1	Lesson Plan 2	Lesson Plan 3
1	Opening	No Quiz available	No Quiz available	Started by Quiz
2	Learning Model	Cooperative	Cooperative-Jigsaw type	Problem Solving
3	Media	The main media for observation activity is power point.	The main media for observation activity is power point and any teaching aid available in the classroom.	The main media for observation activity is well prepared teaching aid combined with power point.
3	Learning Result Assessment	The instrument was not detail.	The instrument was not detail.	The instrument was detail.
4	Closing	Task was not designed, only used the available task in book.	Task was not designed, but reflection was available.	Task was designed and reflection available.

Based on the Table 7, we know that the teacher have changed in constructing lesson plan. The selection of the learning model shows that the teachers have tried to improve their learning.



### 3.4 The Hindrance of The 2013 Curriculum Implementation In Mathematics Learning

Based on the interview toward teachers, we know that the hindrance in the implementation of the 2013 curriculum are: (1) mathematics examples or books presenting mathematics concepts through “*Observing*”, “*Questioning*”, “*Associating*”, “*Experimenting*” and “*Networking/communicating*” activities are less available, (2) lack of guide or supervisor who can guide teachers at school (for instance, the school supervisor). Thus, teachers could not communicate their problems nor get advice to improve their practice, and (3) the Lesson Study model as a means of sharing experience among teachers has not yet been the policy of the education office of Semarang City. Hence, the teachers’ activities in the classroom could not be observed well.

The hindrance of the availability of mathematics examples or books presenting mathematics concepts through “*Observing*”, “*Questioning*”, “*Associating*”, “*Experimenting*” and “*Networking/communicating*” activities contradicts with the ideal condition of mathematics learning which should follow the international standard. For instance, the vision of the *National Council of Teachers of Mathematics* (NCTM) states that mathematics learning should focus on the problem solving, reasoning, and mathematics communication as parts of the curriculum (Kramarski, 2009: 137-138).

## 4 CONCLUSIONS

Based on the research result and analysis, we know that: (1) there is improvement of mathematics teachers’ ability in constructing the plan, implementation, and assessment of mathematics learning based on the 2013 curriculum, (2) various models of lesson plan and learning media based on the 2013 curriculum could be constructed, and (3) the hindrance of the 2013 curriculum implementation within mathematics learning in Muhammadiyah junior high school in Semarang City could be well described. Based on the result of this research, we strongly recommend that the acceleration of the 2013 curriculum implementation could use the lesson study model as the means of organized guidance.

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## Changes in Mathematics Lesson: Insights from Malaysian Tamil Primary Schools’ Lesson Study Process

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**Abstract:** This paper aims to discuss the changes in mathematics lesson planning among three groups of primary mathematics teachers while participating in a Lesson Study (LS) process. The Japanese model of LS process was introduced to these mathematics teachers from three different vernaculars Tamil primary schools in Malaysia. Each LS group consisted of three to four experienced and novice mathematics teachers. The whole process of Lesson Study which include identifying the goals, planning and refining of lessons, lesson observations and reflections, as well as revising the lesson plan drafts and re-teaching of the lessons were video and audio recorded for data analysis. However, for this paper only a comparative analysis of three lesson plans throughout three LS cycles of one participating school was made. Preliminary analysis of the data showed that there were some positive changes in terms of goal settings of the lesson, planning of the lesson structure which includes the set induction, concept development and closure of a 60 minutes mathematics lesson. In sum, this study highlights the potential benefits of LS process which significantly gained interests among the teachers, educators and researchers in planning of a mathematics lesson, as a way of improving mathematics teaching practices and recommended as an effective teacher professional development model to be continuously implemented among the Malaysian educators and researchers.

**Keywords:** Lesson Study process, primary mathematics teachers, lesson planning, lesson setting, lesson structure, effective teacher professional development model.

### 1 INTRODUCTION

In recent years, learning mathematics is a key essential in a daily education system particularly in Malaysia which aims to achieve the status of fully-developed nation by the year of 2020. Malaysia’s interest in preparing its nations for a productive life focus on rising mathematically literature society in order to engage in the wide range value-added economic activities and innovations in the country.

The expectations and demands on teachers have greatly increased especially in light of increased attention particularly towards the classroom teaching practices (Baker & Smith, 1999). The focus in teaching mathematics under the influence of socio-cultural perspectives has been gradually changing from knowledge to practices-based orientations in studying teacher learning and pedagogical knowledge growth (Ball & Bass, 2000). This practice-based orientations meanings teacher learning as exemplified in the self-motivated and tool-mediated interactions with students and teachers in teaching practices. Teachers in China and Japan too often initiated into collaborative working cultures which directed at improving teaching and learning through public lessons and lesson studies (Lewis and Tsuchida, 1998).

In accordance with these changes, this paper considers on a case studying changes in teachers’ planning stages and to ‘capture the essence’ of an effective teaching and learning practices in mathematics classroom after participating in a Japanese teachers’ development model called ‘Lesson Study’(LS) process.

### 2 REVIEW OF LITERATURE

The literature indicates *Lesson Study*; a form of collaborative school-based professional development initiative originated from Japan (Fernandez & Yoshida, 2004) and implemented extensively across the world (Stigler & Heibert, 1999) has improved teaching and learning of mathematics. Due to the positive outcome experienced from the implementation of *LS*, the attempt has been made in this study to implement *LS* as a component of professional development model in a Tamil Primary School in Malaysia.

The effectiveness of *LS* in changing the teaching practices and learning outcomes from the teachers’ perspective have been measured. For this purpose, in the following section background on Tamil primary schools in Malaysia; perspectives of effective teaching and learning mathematics and an overview of *Lesson Study* will be provided.

## 2.1 Background of Tamil Primary Schools in Malaysia

Malaysia is a multiracial country with majority of the population is Malays followed with Chinese and Indians. Numerous national primary schools have been established throughout the country to provide basic education (Teacher Education Division, 2005) to the people. However, the public was given opportunity to obtain basic education at primary level from vernacular schools (Curriculum Development Centre, 2001).

Vernacular schools have been established in the country to provide basic education since British colonization. The first Tamil primary school was established in Penang in 1816 and currently there are 523 Tamil schools in the country (Department of Statistic, 2012). At early stage majority of the schools are located at rubber estates and primarily attended by Malaysian Indians of Tamil origin. Due to the urbanization there is a declination among the young people leaving in rubber estates which resulted lower enrolment in the Tamil primary schools. Some of the schools also have been relocated to major urban areas where the majority of the populations are Indians (Department of Statistic, 2012).

Tamil primary schools play an important role in developing talented generations as well as National and Chinese type primary schools in Malaysia. All types of primary schools are sharing similar curriculum specifications in all the subjects except the Tamil and Chinese language in both Tamil and Chinese type of vernacular schools (Curriculum Development Centre, 2001). Based on the perspective of this study, teaching and learning mathematics carried out in all primary schools is based on the similar curriculum specifications. The medium of the language used in teaching mathematics in Tamil primary schools is in dual English and Tamil language while the other types of schools are in also in Malay, Chinese and English language (CDC; MOE, 2001). Even though the equal time period allocated for all types of schools for teaching mathematics, comparatively the performance of Tamil primary schools in mathematics is still lack behind from the other types of primary schools in Malaysia (Department of Statistics, 2012).

## 2.2 Perspectives of Effective Teaching and Learning Mathematics

Talking about teaching, we have to define first what we mean by *effective teaching*. Three main perspectives on effective teaching reviewed in this study. One perspective defines effective teaching

in terms of what teachers they themselves consider effective teaching to be all about (Young & Shaw, 1999). After conducting a meta-analysis of 31 studies, Feldman (1988) concluded that faculty's three top choices of instructional dimensions were a) knowledge of the subject, b) enthusiasm for teaching or for the subject, and c) sensitivity to, and concern with , class level and progress, in that order.

The second approach defines effective teaching from a student's perspective (Young & Shaw, 1999). Feldman (1988) found that students' top choice of effective teaching were, in order of importance: a) sensitivity to, and concern with, class level and progress, b) teacher's preparation; organization of the course, and c) teacher's stimulation of interest in the course and its subject matter.

The third approach is to regard effective teaching as those instructional techniques and practices both teachers and students agree to be effective. Feldman (1988) also found that both students and teachers concur in defining effective instruction in terms of course preparation and organization of the class. And yet, discrepancies remain between teachers and students. If judged under the lenses of the schools, then effective teaching would be defined in terms of knowledge and holding high standards.

Mathematics teaching is also involves practices that the teachers performs prior to the teaching or during the teaching (Stacey & Vincent, 2009). The practices comprises of deciding on the objectives of the lesson; instructional strategies to be used in line with the objectives; planning of the lesson, and methods to effectively assess students' work (Hill, Rowan & Ball, 2005). On the contrary, learning reflects on the students' participation in the classroom. Teaching began as early as the teacher start to think about what to teach in the next lesson (Stigler & Heibert, 1999).

In delivering effective teaching, the teachers need to identify the ways to implement learning so that the objective of the lessons could be achieved using appropriate instructional strategies (Morris & Hiebert, 2011). For this, teachers and students collectively agreed that teacher's preparation constitutes an important aspect of effective teaching practices (Feldman, 1988).

Thus, effective planning of the lessons in preparing the lesson resulted in improved learning of mathematics (Leikin, 2006). Instructional techniques and the learning styles used by the teachers were also another factor that determines the effectiveness of a teaching (Young & Shaw, 1999). Therefore for the purpose of this paper, the study aims to draws on lesson planning through

three LS cycles of one Tamil primary school out of three schools participated in this study.

### 3 THEORETICAL BACKGROUND

#### 3.1 Lesson Study Process

Lesson Study is a collaboration-based teacher professional development approach that originated in Japan (Fernandez & Yoshida, 2004). It provides a chance for teachers to reflect collaboratively on their planning and teaching of their daily lesson. Lesson Study is also positioned around teachers' interests, is learner motivated, provides opportunities for teachers to be researchers, provides ample of time and opportunities for the teachers to reflect on their teaching practices and student learning (Murata & Takahashi, 2002, p.10). Furthermore (Hiebert et al., 2002) stated that *LS* is a teaching improvement and knowledge building process that has its origins in Japanese primary education.

In *LS*, teachers tend to work in a small team to plan, teach, observe, analyses, and refine individual class lessons, called as research lesson. One main reason for the admiration of Lesson Study process, that it provides Japanese teachers with opportunities to make sense of educational ideas within their practices; change their perspectives on teaching and learning; learn to see their practice from a learner's viewpoint; and enjoy collaborative support among their colleagues (Takahashi et al., 2006, p.201).

Lesson study process is also said to be premised on the Confucian saying that, “*seeing something once is better than hearing about it one hundred times*” (Corcoran & Pepperell, 2011). Its crucial purpose is to gain new ideas about teaching and learning based on a better understanding of children's thinking so the observation of actual research lessons is at the core of the lesson study process. Yet, the Lesson study cycles encompasses much more than studying children's responses while observing lesson. It requires point dedicated to intensive *kyozaiikenkyu*- a process in which teachers collaboratively investigate all aspects of the content to be taught and instructional materials available – and to *jyugyokentuikai*- the post-lesson review session (Takahashi et al., 2006). The main feature of Lesson study process is collaborative planning and reflection that does not shy away from a critique of practice focused on the results of the group's work rather than on any individual. In these ways, it appears to offer teachers an opportunity to pool their collective teaching skills in situ as they adopt research goals appropriate to a particular school context for their lesson study

process. In Japan, where it is an integral to schools, Lesson Study is often credited with the success of Japanese students in international comparisons of mathematical achievement (Stigler & Hiebert, 1999). Internationally, there has been an increase in cross-cultural study of ways of teaching mathematics, and a growing interest in using lesson study as a basis for improving teaching in a variety of other contexts, most notably in Malaysia.

#### 3.2 Quality of the Lesson

Stigler & Hiebert (1999) stated about the importance of a mathematics lesson in three main components: reviewing previous content related to the new lesson (by teacher and students), student working mathematical task (by students) and sharing ideas (by students) in a summarizing whole- class discussion that identifies the lesson outcome (by teacher and students). The quality of mathematics teaching and learning is also depends on the teachers' notions of the objectives of the mathematical task given and monitored (Jaworski, 1992). Therefore, planning stages prior to classroom teaching is very important in determining the understanding of the students towards the lesson and achieving the planned learning outcomes.

### 4 THE STUDY

The researcher (first author) invited the school to participate in the larger study consist of seven different type of primary schools from three various states of Malaysia. Particularly, mathematics teachers were involved mainly intended to improve their teaching methods in classroom teaching practices. However, for the purpose of this study, one out of the three vernacular Tamil primary schools was chosen to investigate the changes in lesson planning through three *LS* cycles conducted continuously throughout the study. The *LS* team of school Y (with fictive names) a sub-urban school completed three cycles in the school year 2011-2014.

#### 4.1 Participants

Two primary mathematics teachers from school Y identified volunteered to participate in this study. Among the two participating teachers one teacher *Muru* was an experienced with >20 years and the other was teacher *Sara* with <5 years of mathematics classroom teaching experiences in primary schools. In this study, the researcher presumed the role of a participant-researcher and

as a researcher during the implementation of the lesson study process.

## 4.2 Data Collection Procedures

This paper described research findings by a qualitative illustrative resulting during three LS cycles Data were collected mainly through artefacts such as lesson plans and students' worksheets, video observations and audio-recordings of individual interviews with the teachers and post-lesson reflections in the larger study. For the purpose of this paper, three lesson plans collected from every LS cycles and classroom observations which were video-recorded were analysed qualitatively. The procedure of the study consist of: (i) lesson planning by the LS group, (ii) teaching the planned lesson by one of the teachers and observation by other members of the LS group, (iii) reflecting on the lesson collaboratively to plan an improved the revised lesson, (iv) teaching the revised lesson by one of the teachers in another classroom and observed by the team members again, and (v) collaboratively conducting a final reflection session. The findings ultimately focus on three lesson plans prepared by both teachers *Sara* and *Muru* as they were agreed to teach the lesson by turns. It has enabled better analysis of the changes in teaching practices. The first cycle focus on the topic of coordinate, second cycle on the two dimensional shapes both for Year 4 students and the third cycle on the length for Year 6 students.

## 5 RESULTS AND DISCUSSION

This paper attempt to describe the identified changes in three lesson plans in throughout three LS cycles and connected the mechanisms of the changes in the teaching practices.

### 5.1 Emerging Themes on Lesson Plan Analysis

The type of analysis presented in this paper was based on the sub-sections of the lesson structure and lesson setting as described above. However, in both the *lesson structures* and *settings* were merged together as the following categories: *learning objective, opening of the lesson, concept development which includes the structure of concept development process and lesson ending* The results were discussed below after an in-depth analysis of the three lesson plans obtained from school A.

### 5.1.1 Learning Objectives

Young (1979) highlighted an old proverb, which denotes the importance of defining objectives as, "If you don't know where you are going, any road will take you there." This saying clearly indicates that one has to decide first where to go. In this point, learning objectives in a lesson plan are an objective which shows the teacher the direction where to go. They are ends to be achieved at the end of any lesson as the result of instructional activities. Hence, in this study while analysing the lesson plans from the three LS cycles, the learning objectives were argued in two categories that as general and specific objectives. General objectives were defined as general learning goal which is not much related in-detail with the topic of the lesson or clearly defined as implicit ones. Nevertheless, specific objectives were referring as very specific and in-detail goal with mathematical concepts related to the topic of the lesson and which is measurable.

The following Table 5.1 below clearly displays the excerpts of the general and specific learning objectives obtained from the three research lessons throughout the three LS cycles of school A.

Table 5.1: Excerpts of Learning Objectives

1 <sup>st</sup> LS cycle	2 <sup>nd</sup> LS cycle	3 <sup>rd</sup> LS cycle
<b>Topic: Coordinate</b> <b>Year : 4</b>	<b>Topic: 2-D Shapes</b> <b>Year: 4</b>	<b>Topic: Length</b> <b>Year: 6</b>
<ol style="list-style-type: none"> <li><b>Identify</b> components of the Cartesian plane, including the horizontal axis and vertical axis.</li> <li>To <b>understand</b> coordinates, that have to move across first and then up or down.</li> <li>To <b>identify</b> coordination at the first quadrant.</li> <li><b>Name</b> the position of objects given in Cartesian plane.</li> </ol>	<ol style="list-style-type: none"> <li><b>Identify</b> the sides of 2-D Shapes.</li> <li><b>Measure</b> and <b>record</b> the perimeter of square, rectangle and triangle.</li> <li><b>Calculate</b> the perimeter of 2-D Shapes -square, rectangle and triangle.</li> </ol>	<ol style="list-style-type: none"> <li>Pupils will <b>compute</b> length from a situation <b>expressed</b> in fraction</li> </ol>

The topic taught in school A at the first LS cycle was among the newly integrated topic in mathematics curriculum of Year 4 by the Curriculum Development Centre, (MOE, 2013). The learning objectives plan in school A at this cycle were very detail and in explicit manner. The

four learning objectives planned in the lesson demonstrates the combination of relational and instrumental understanding as suggested by (Skemp 1976) in his article titled “Instrumental understanding and relational understanding”. The learning objectives were classified in terms of specific learning objectives. This well-planned learning objective in the lesson plan stimulates the sense of making mathematical concepts of the topic. But then, the orders of the objectives drawn in the plan were not heuristically follows from mathematical understanding to conceptual terms of learning objectives. For instances, as the first learning objective exhibits that identifying components of the Cartesian plan followed by understanding coordinates, again identifying coordination at the first quadrant and finally naming the position of objects given in the plane. The participant teachers upon their first lesson plan refining session outcome could have combined the key terms of learning objectives accordingly as understanding, identifying and followed by naming. The researcher felt that there are too many learning objectives to be focused at one time within one hour lesson. The time allocated for the lesson might be short to achieve the four learning objectives at once and it might interrupt students’ understanding process. Nevertheless, sequencing the position of the terms was not given much attention, the lesson plan none other demonstrates a detailed planning on the learning goal to be achieved by the students at the end of the lesson.

Ensuing to the second (2<sup>nd</sup>) LS cycle, the lesson planned in school A was on the topic of Shape and Space (2-D Shapes) of Year 4 clearly exemplify the three specific learning objectives as identify the sides of 2-D shapes, measure and record the perimeter of square, rectangle and triangle and finally calculate the perimeter of 2-D Shapes(square, rectangle and triangle).Upon, experiencing the participation in one complete Lesson Study cycle, the participants teachers shows some positive changes in their planning of the lesson particularly at the learning objectives section. The learning objectives in this lesson were well-ordered planned in a way as identifying, measuring, and recording. The objectives planned were based on chronological manner as understand the mathematical concepts, practice, evaluate and apply where it proceeds to instrumental understanding of the topic.

Here at the third LS cycle, a single sentence of learning objectives planned in School A reflects a one-hour lesson content to be taught. The teachers planned as, ‘at the end of lesson the pupils were able to **computer length** from a **situation expressed in fraction**’. The word ‘compute length’ did not exhibits the specific units of length since

there are many type of units and terms in length are available in the topic. The word ‘a situation expressed in fraction’ also did not clearly mentioned what was the situation expressed in fraction and it was very general and broad. There are many types of fraction as well in the content of the fraction topic. It did not reflect any specific units of length as similar to the types of fractions. What are the units of length mentioned here? What type of fraction expressed here as there are many?

### 5.1.2 Lesson Opening

To start a good lesson of the day introduction is an important element that attracts students’ attention and interest towards the progress of a lesson. Opening of the lesson constitutes an important aspect in lesson planning. Opening of the lesson or more specifically introduction of the lesson in this paper were reviewed on six different subcategories as: *reviewing the previous knowledge; mathematical content focus; usage of concrete objects and tools; posing problems, real-life situations; hands-on activities; and demonstrations*. In the following section the information about how opening of the lessons evolved throughout the 3 Lesson Study (LS) cycles in school A will be presented according to the aforementioned characteristics of an opening.

Well, no indication noticed in lesson plan of school A to reflect on the prior knowledge of the students during the LS cycle 1. This lesson was planned to teach by one of the teacher called Muru (pseudonym name) from the LS team. This experienced teacher initially plan the lesson with his LS participant team based on the outcome of the group discussion as suggested in the Lesson study process. Instead of reviewing the previous knowledge of the students, lesson plan in cycle 1 were planned to pose few types of open-ended questions to the students. Students were questioned regarding their general knowledge regarding the lesson topic that knowledge about their daily-life situations from their school to home. Ideally, the challenging questions prompt students’ general knowledge relates to the content of the lesson. Following excerpts were the details obtained in lesson plan of LS cycle 1 from the school A:

“Where is the Kaliamman Temple?”  
 “Can you explain the location of the temple?”

However, teacher Sara noticed to review out the students’ earlier knowledge during LS cycle 2 and cycle 3. In LS cycle 2, the intention reflected in a superficial manner whereby general questions were posed to the students. Following excerpts were the information identified in lesson plan of LS cycle 2 from the school A as:

*“Recall pupils’ previous knowledge of 2D shapes”  
“Show diagrams of 2D shapes and ask pupils to name the shapes”*

The topic of the lesson in this cycle was planned as: Shape and Space of 2D shapes. Generally, at the beginning of the lesson teachers plan to just recall their knowledge about the 2D shapes. Teacher use demonstration method to show the diagrams and ask the pupils to name the shapes. Apparently, the reviewing of the previous knowledge in this plan shows that the participant teachers intend to change the opening of the lesson after the in-depth discussion outcome in setting the goal for the *LS* cycle 2. This is obviously showing that after the *LS* cycle 1, the participant teachers become more focus and precise in designing their opening of the lesson.

On more detail, it can be seen in planning of the lesson of *LS* cycle 3 the teachers intention to derive the previous knowledge appears to be clear. The excerpt obtained from the lesson plan which was planned to teach by teacher Sara during *LS* cycle 3 of school A.

*“Recall pupils’ previous knowledge of concepts / terms/ formulas listed below:”*

- reading and measuring length
- conversion of units
- calculation of length
- multiplication of fraction

### **The Changes**

The two participant teachers started to work in more collaborative manner focusing on learning objective of the lesson. The changes in the planning stage show that participation in Lesson study process is worthwhile. It could be surmised that with the progress of *LS* cycles the teachers’ intention to identify of the students’ prior knowledge is further improved. On presenting the opening of the lesson school A exhibited that the beginning of the lesson was planned based on posing problems in related to the number sentences and mathematical word problems.

### **5.1.3 Concept Development**

The concept development analysed from the three lesson plan collected from the three *LS* cycles includes type of grouping, tasks given and materials and representations. *Concept Development* in the lessons are intended to assess and develop students’ understanding of fundamental concepts through activities that engage them in classifying and defining, representing concepts in multiple ways, testing and challenging common misconceptions and exploring structure. Research has shown that individual, routine practice on standard problems does little to help students deepen their

understanding of mathematical concepts. Teaching becomes more effective when existing interpretations (and misinterpretations) of concepts are shared and systematically explored within the classroom. The structure of concept development lessons simply includes whole class discussion, collaborative work on a substantial activity, students share their thinking with the whole class and students revisit the assessment task.

At the first *LS* cycle, the lesson plan exhibits the posing of the problems by the teacher using whole class introductions. The main activity in this lesson was solving problems with modifying situations and exploring their structure. Next, the lesson plan continued with individual solution methods.

The excerpts of the lesson plan given below:

- Teacher explains the correct way.
- Teacher gives example
- Teacher present
- Teacher explain and students were ask to name the location.

At the second *LS* cycle, the lesson plan was plan more to collaborative work activities such as classifying mathematical objects, interpreting multiple representations, evaluating conjectures and assertions and modifying situations and exploring their structure. Excerpts obtain from the lesson plan in *LS* cycle 2.

- Pupils are divided into group of three.
- Ask pupils to look around the class and choose a thing.
- Ask pupils to measure and think.

The lesson plan drafted at the third *LS* cycle, demonstrated that the lesson concept developments started with collaborative work on a substantial activities where students exploring the structure of problems. Here, it was plan such as the students were given the task of devising their own mathematical problems. They try to devise problems that are both challenging and that they know they can solve correctly. Students first solve their own problems and then challenge other students to solve them.

Excerpts of the lesson plan at the third *LS* cycle given below:

- Teacher gives 50cm ribbon/string to measure.
- Get another pupil to divide the same ribbon.
- Pose questions to the class.
- Presentations
- Hands-on activities
- Worksheet assessments

### *The Changes*

The concept development process while the progress of LS cycles changes simultaneously. The lesson planning stages changes into in-depth and conceptually organised planning while the teachers emerged themselves in LS process. The concept development process slowly adapting the structure of the concept lesson as completing task before the content introduction, whole class introduction, collaborative work on a substantial activities, students share their thinking with the whole class and completing the assessment tasks given.

#### **5.1.4 Lesson Ending**

The themes on the lesson ending discussed in this paper consist of the lesson ends with interactive activities, revising the concept development, repeating the set induction activities. Lesson plan in the first cycle exhibits a very general summary and announcement of the next lesson. Further, the closing of the lesson demonstrated answering teacher's questions towards understanding of the content.

At the second cycle, the lesson was planned to end with an worksheet assessments, emerging of real-life problems and complete summary of the lesson.

The excerpts of the lesson plan below:

- Introduction to real-life problem and summary
- Teacher gives two real-life problem involving perimeter.
- Students discuss and solve the problem.

While at the third LS cycle, the lesson was planned exhibits the similar as the second lesson plan contents. The only changes were the topic of the lesson.

### *The Changes*

The lesson ending clearly revealed some changes in the planning of the lesson plan throughout the three cycles. The teachers tend to realise the importance of the summing-up the lesson towards deep understandings on the contents of the lesson.

### **5.2 The Mechanism of Changes in Teaching Practices**

The changes in Sara and Muru's teaching practices between the three lessons were an important effect of the quality of the classroom lesson. In this case, John Mason (2002) stated that the importance of teacher consciousness and perceiving for learning through teaching. Mason (2010) suggested that collaboration between teachers strengthens learning from teaching. As he pointed out; that by

collaborating teachers can perform with higher spiritual processes to and with each other. This could make them grow in and into the community of teaching practices (Mason, 2010). The positive manner of changes among the participating teachers manifested themselves when they reflected on their own practices from a new perspective while participating in LS process. The changes in teaching practices occurred within a short stipulated time period. Researcher beliefs that the two teachers who participated in the lesson study process in school A gained a new awareness after initialling how their own teaching practices impacted their mathematics classroom discourse and this led them to re-examine their own beliefs about teaching and learning.

### **5.3 Conclusion and Implications**

These findings indicate that Lesson Study may encourage teachers learning to critically reflect on their own teaching practices through detailed lesson planning. Participant teachers who participated in Lesson Study process transformed their teaching strategies after sharing the idea of Lesson Study with their peers. Continued observation over a year indicated that the two participating teachers maintained these changes in planning and teaching further while continued observation will indicate whether these changes become embedded into their daily teaching practices. This study also supports other research findings that teaching practices changes require a social group to identify shared experiences through critical reflections on planning the lesson and create a new era to promote this professional development model. Other additional research studies are also needed to identify other aspects of Lesson Study process that develop teachers' instructional and pedagogical skills.

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## Analyzing The Effectiveness Of Teachers Classroom Assessment Techniques For Students Learning In Implementing Lesson Study

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**Abstract:** This study is to investigate teachers assessment techniques used and to evaluate its effectiveness for students learning in classroom using open lesson study in schools. The teacher can play an important role in assessing the students' progress by various techniques appropriately with nature of subject and students' developmental level. The assessment technique used in most schools still emphasizes on learning achievement, especially the achievement obtaining from testing. The assessment by test do not measure students' real condition, and could not assess both of product and process which the students have had real practice. Students assessment while they are participating in classroom activity is the most necessary thing to be done. In classroom using the assessment for supporting one's learning, the teacher should adjust teaching continuously in order to see changes in students' learning. Effective teachers have learning objectives for their students and use assessments to see progress. This research focuses on the effectiveness of assessment techniques used against the intended objectives to be achieved by teachers in class room using open lesson study. Three subject-based open lessons from three different primary and junior schools observed by teachers who participate in lesson study. Teachers observe the open lesson and evaluate the lesson using lesson observation checklist extracted from standard matrix. The three observed lessons analyzed qualitatively and presented descriptively. The result showed that performance assessment of the group work based on observation and judgment is dominantly used by the model teacher in all three open lessons; and 48.8% observers in SD UPI lab school, 65.3% observers in SD Negeri Tanjungsari I school and 41.6% observers in SMP Negeri 26 agreed that the teacher use appropriate class room assessment techniques. In general the three lessons contain basic/necessary information and the lesson objectives were SMART. The lesson plan has appropriate assessment techniques coherent with the lesson objectives. Further teacher cooperative learning through lesson study in such schools should be practiced for improvement of class room assessment techniques.

**Key words:** lesson study, Indonesia University of Education, classroom assessment technique classroom based assessment

### 1 INTRODUCTION

Assessment is the systematic collection, review, and use of information about educational programs undertaken for the purpose of improving learning and development (Palomba & Banta, 1999). Assessment can be done at various times throughout a program and a comprehensive assessment plan will include formative and summative assessment. The point at which the assessment occurs in a program distinguishes these two categories of assessment (formative and summative). Formative assessment is often done at the beginning or during a program, thus providing the opportunity for immediate evidence for student

learning in a particular course or at a particular point in a program. Classroom assessment is one of the most common formative assessment techniques. The purpose of this technique is to improve quality of student learning and should not be evaluative or involve grading students. This can also lead to curricular modifications when specific courses have not met the student learning outcomes. Summative assessment is comprehensive in nature, provides accountability and is used to check the level of learning at the end of the program. For example, if upon completion of a program students will have the knowledge to pass an accreditation test, taking the test would be summative in nature since it is based on the

cumulative learning experience. Program goals and objectives often reflect the cumulative nature of the learning that takes place in a program. Thus the program would conduct summative assessment at the end of the program to ensure students have met the program goals and objectives.

The purpose of class room assessment is to improve the quality of student learning, not to provide evidence for evaluating or grading students. It provides faculty with feedback about their effectiveness as teachers, and it gives students a measure of their progress as learners. The aim of classroom assessments is to provide faculty with information on what, how much, and how well students are learning. Such assessments are created, administered, and analyzed by teachers themselves. Classroom assessment can also provide important program information when multiple sections of a course are taught because it enables programs to examine if the learning goals and objectives are met in all sections of the course. It can also improve instructional quality by engaging the faculty in the design and practice of the course goals and objectives and the course impact on the program.

The assessment for developing the students' learning, Rob-inson & Bartlett (1993) stated that it was in context of instructional management as the process in trying to understand the students' activity participation. It was more than testing since it should be continuously and regularly performed in order to see the students' understanding in the process, interaction, and application. It was not the last step of instructional activity. But, it was the starting point for enhancing the students' learning. It was supported by Miyauchi (2010) that the children's assessment while they were participating in classroom activity was the most necessary thing to be done. In order to accomplish curriculum objective, teacher should collect data of students' changes and progress of thought and comprehension. White (2007) suggested that assessment should be seen as a process for gathering evidence and making judgment about students needs strengths, abilities and achievements. So, when the assessment was spoken, the process should be emphasized rather than produced. In classroom using the assessment for supporting one's learning, the teacher should adjust teaching continuously in order to see the students' changes (Leahy et al., 2005). Black & William (1998) concluded the research studies regarding to the occurrences in class as follows:

Firstly, to set the problem as guidelines for students to use their skill as well as apply their approach  
Secondly, to provide opportunity for students to communicate what they had learned by drawing, acting, role playing, concept mapping, an

d Thirdly, to observe by listening to the students while they were explaining and reasoning  
Fourthly, to set question by using open-ended problem situation as the phrase inviting the students to explore their own approach and reason,  
Fifthly, to dis-cuss the words or techniques used by the students.

### 1.1 Classroom Assessment Techniques (CATs)

Classroom assessment techniques include a wide range of activities that may be grouped into the categories of summative or formative. Summative assessment techniques (e.g. testing and student ratings of instruction) are evaluative, occur at the end of learning, and, for the most part, are used to determine the extent to which learning has been retained. Formative assessment is reflective, student-centered, and used as an ongoing process to improve learning. Formative assessment allows for the correction, clarification and adjustment, by both teacher and student, to information prior to summative assessment (Adams, 2004). Formative classroom assessment techniques are linked to cognitive learning theory (Steadman, 1998), which focuses on how information is processed.

Classroom assessment focuses the primary attention of teacher and students on observing and improving learning, rather than on observing and improving teaching. To improve learning, it may often be more effective to help students change their study habits or develop their metacognitive skills (skills in thinking about their own thinking and learning) than to change the instructor's teaching behavior. In the end, if they are to become independent lifelong learners, students must take full responsibility for their learning. To achieve that end, both teachers and students will need to make adjustments to improve learning. Classroom assessment can provide information to guide them in making those adjustments (Angelo and Cross, 1993).

The use of CATs assumes that students must receive ungraded feedback, early and often, that students need to assess the quality of their own learning, and that students can assist in improving course instruction.

Angelo and Cross (1993) provide a list of the various CATs, which differ in complexity and the time they take to prepare, administer, and analyze. CATs also vary in use, based on instructional needs; however, a few of the most frequently mentioned CATs in the literature include: *the Minute Paper* – a one-minute writing assignment asking students to write about what they thought was the most important point made in class on a given day; the one-sentence summary; *the Memory Matrix* – an assignment in which students fill in cells of a diagram for which the instructor has

provided labels; and *the Muddiest Point* – a short writing assignment asking students to provide information on what they find least clear or most confusing about a particular lesson or topic.

On-going assessment of student learning is an essential aspect of effective teaching. Teachers can use a variety of assessment methods to diagnose students’ strengths and needs, plan and adjust instruction, and provide feedback to students and parents regarding progress and achievement. The primary purpose of classroom assessment is improving learning not to sort and select students or to justify a grade. Regardless of the particular methods employed, effective classroom assessment is guided by three fundamental principles. Classroom assessment should: promote learning, use multiple sources of information, and provide, fair, valid, and reliable information. Although there are various assessments, all of the assessments we have experienced fall into one of four basic categories of methods: Selected response and short, extended written, Performance and Personal communication. All four methods are legitimate options when their use correlates highly with the learning target and the intended use of the information.

Observation is the primary assessment method, and immediate descriptive feedback is essential to improving student learning in the multilevel classroom. Because each classroom forms its own culture, teachers play a powerful role as observers, and their professional judgement is valued and integral to quality classroom observation. Observation provides teachers in multilevel classrooms with an effective and efficient way to explore their students’ thinking. Assessment is an ongoing process aimed at understanding and improving student learning. It involves making our expectations explicit and public; setting appropriate criteria and high standards for learning quality; systematically gathering, analyzing, and interpreting evidence to determine how well performance matches those expectations and standards; and using the resulting information to document, explain, and improve performance. When it is embedded effectively within larger institutional systems, assessment can help us focus our collective attention, examine our assumptions, and create a shared academic culture dedicated to assuring and improving the quality of higher education (Angelo, 1995.)

### 1.2 Performance-Based Assessment

By performance based assessment, we are referring to assessment activities that directly assess student’s understanding and proficiency. These assessments allow students to construct a response, create a product, or perform a demonstration to show what they understand and can do. Since they call for students to apply knowledge and skills

rather than simply to recall and recognize, performance-based assessment are more likely to reveal student understanding. They are well suited to assessing application of content specific knowledge, integration of knowledge across subject area, and lifelong learning competencies such as effective decision making, communication and cooperation (Sheppard, 1989). Using performance assessment, teachers are able to directly observe the application of desired skills and knowledge. Performance assessments can be among the most authentic types of student assessment since they can replicate the kind of actual performances occurring in the world outside of school.

Investigations of teachers’ assessment practices revealed that teachers were not well prepared to meet the demand of classroom assessment due to inadequate training ( Hills, 1991; O’Sullivan & Chalnck, 1991). Recent years have seen increased research on classroom assessment as an essential aspect of effective teaching and learning (Bryant and Driscoll, 1998; McMillan, Myran and Workman, 2002; Stiggins, 2002). It is becoming more and more evident that classroom assessment is an integral component of the teaching and learning process (Gipps, 1990; Black and Wiliam, 1998). Ampiah, Hart, Nkhata and Nyirenda (2003) contend that a teacher needs to know what children are able to do or not if he/she is to plan effectively.

Therefore, in viewpoint of students’ learning assessment in class, major issues could be concluded that the evaluation for developing and supporting students’ learning should be emphasized. To improve class room assessment in science subjects, lesson study as a cooperative learning approach, is implemented in many countries. One of the countries implementing lesson study is Indonesia as an example. According to Sagor (2000), lesson study employed to improve it the quality of education. Therefore it is necessary to analyze/investigate class room assessment technique used in lesson study and its effectiveness for students’ learning, since the innovation was used by teachers, as context enhancing the learning in both teachers and students (Inprasitha, 2010).

**Objective of the study:** The objective of this study is to analyze/investigate teachers class room assessment techniques used and its effectiveness for students learning in classroom using open lesson study .

## 2 METHOD

To analyze the effectiveness of teacher’s classroom assessment techniques for Students Learning in Implementing Lesson Study, three open lessons (subject-based and school –based lesson study) from three different primary and junior schools

observed. The schools selected for such purpose are: SD Negeri Tanjungsari I, SD UPI lab school and SMP Negeri 26. Negeri Tanjungsari I primary school is located in Sumedang district but SMP Negeri 26 and SD UPI lab school are found in Bandung .All the school subject teachers participating to the open lesson were used to evaluate the effectiveness of classroom assessment techniques used by the model teacher .The three lessons observed were science and mathematics. Subject-based lesson was observed in UPI lab school and SD Negeri Tanjungsari I school and school-based lesson observed in SMP Negeri 26 School. Teachers observe the open lesson and evaluate the lesson using lesson observation checklist which is extracted from standard matrix (MOE,2014). The three observed lessons analyzed qualitatively and presented descriptively. The teachers evaluation of assessment techniques used then interpreted using the standard matrix. The response of lesson observer against given criteria

for lesson objective and classroom assessment techniques applied in three schools was analyzed and evaluated further and the results of the research work were summarized using tables.

### 3 RESULT

#### 3.1 Description of Study Participants

A total of 52 teachers in three different schools were included in this study for lesson observation. The mean year of service in teaching of all the study participants was 17 years with range from 3 to 36 years. Teachers that participate in lesson observation were subject teachers. Of the total 52 teachers, 42 teachers have bachelor degree, have masters degree and the remaining 4 teachers didn't show their academic qualification. Therefore dominantly the lesson observers have bachelor degree.

**Table 1:** School name, number of participants and their average year of service

School name	Total teachers	Average year of service	School location	Grade level
SD UPI Lab school	18	23	Bandung	primary
SD Negeri Tanjungsari I	19	16	Sumedang district	Primary
SMP Negeri 26	25	13	Bandung	junior
Total	52			

#### 3.2 General information of the lesson plan

The lesson plan of the three schools have the necessary general information like the rational, learning contents , teaching and learning activities ,

assessment, time for each stage of the lesson, teaching and learning materials and learner's support. But time for each stage of lesson in SMP Negeri 26 school is not shown clearly. For each criterion the response of lesson observer is shown in table 2 bellow.

**Table 2:** Teachers response to the lesson plan general information

Evaluation Criterion	SD UPI Lab school		SD Negeri Tanjungsari I		SMP Negeri 26	
	Yes F (%)	No F (%)	Yes F (%)	No F (%)	Yes F (%)	No F (%)
Rationales	14 (77.7%)	4 (12.3%)	17 (89.5%)	2 (10.5%)	14 (56%)	11 (44%)
Objectives	18 (100%)	0 (0%)	19 (100%)	0 (0%)	24 (100%)	0 (0%)
Learning contents	18 (100%)	0 (0%)	19 (100%)	0 (0%)	25 (100%)	0 (0%)
Teaching and Learning (T&L) Activities	18 (100%)	0 (0%)	19 (100%)	0 (0%)	24 (96%)	1 (4%)
Assessment/Evaluation	18 (100%)	0 (0%)	17 (89.5%)	2 (10.5%)	19 (76%)	6 (14%)
Time for each stage of the lesson	18 (100%)	0 (0%)	19 (100%)	0 (0%)	6 (14%)	19 (76%)
Teaching and Learning (T&L) Materials	18 (100%)	0 (0%)	19 (100%)	0 (0%)	20 (80%)	5 (20%)
Learner’s Support	18 (100%)	0 (0%)	19 (100%)	0 (0%)	22 (88%)	3 (12%)
<b>Total</b>	<b>140 (97.2%)</b>	<b>4 (2.8%)</b>	<b>146 (96%)</b>	<b>6 (4%)</b>	<b>154 (77%)</b>	<b>46 (23%)</b>

### 3.3 Lesson plan objectives:

As shown in table below the lesson plan is specific, measurable, attainable, relevant, and time-framed and contains the three domains (cognitive,

psychomotor and affective) of learning objectives. The lesson observer respond to characteristics of lesson objectives (how SMART) of the lesson. The result showed that in SD Negeri Tanjungsari I it is 96.5%, In SMP Negeri 26, 82% and in UPI Lab School, 72% as shown in table below.

**Table 3:** Teachers response to the lesson plan SMART characteristics

Evaluation Criterion	SD UPI Lab school		SD Negeri Tanjungsari I		SMP Negeri 26	
	Yes F (%)	No F (%)	Yes F (%)	No F (%)	Yes F (%)	No F (%)
<b>Objectives of the lesson has the following characteristics/ SMART/</b>						
Specific	16 (88.8%)	2 (1.2%)	19 (100%)	0 (0%)	23 (92%)	2 (8%)
Measureable	18 (100%)	0 (0%)	19 (100%)	0 (0%)	25 (100%)	0 (0%)
Attainable	18 (100%)	0 (0%)	15 (78.9%)	4 (21.1%)	19 (76%)	6 (14%)
Relevant	18 (100%)	0 (0%)	19 (100%)	0 (0%)	23 (92%)	2 (8%)
Time-framed	18 (100%)	0 (0%)	19 (100%)	0 (0%)	11 (44%)	14 (56%)
Consisting of three domains (cognitive, psychomotor and affective)	17 (94.4%)	1 (5.6%)	19 (100%)	0 (0%)	22 (88%)	3 (12%)
<b>Total</b>	<b>108 (72%)</b>	<b>3 (28%)</b>	<b>110 (96.5%)</b>	<b>4 (3.5%)</b>	<b>123 (82%)</b>	<b>27 (18%)</b>

### 3.4 Planed Assessment Techniques Characteristic

The characteristic of planned assessment techniques of the lesson based on the given criteria is evaluated and the result is shown below in table 4.

Table 4: Teachers response to the planed objectives of the lesson

Evaluation Criterion	SD UPI Lab school		SD Negeri Tanjungsari I		SMP Negeri 26	
	Yes F (%)	No F (%)	Yes F (%)	No F (%)	Yes F (%)	No F (%)
Appropriate technique (Q&A, Class Activities, observation used)	15 (83.3%)	3 (16.7%)	19 (100%)	0 (0%)	17 (68%)	8 (32%)
Coherent with the lesson objectives	17 (94.4%)	1 (5.6%)	17 (89.5%)	2 (10.5%)	21 (84%)	4 (16%)
Relevant to learning contents	18 (100%)	0 (0%)	19 (100%)	0 (0%)	24 (96%)	1 (4%)
Indicate every stage of learning activities	16 (88.8%)	2 (11.2%)	16 (84.2%)	3 (15.8%)	19 (76%)	6 (24%)
Adequate to assess students learning.	16 (88.8%)	2 (11.2%)	14 (73.6%)	5 (26.4%)	18 (72%)	7 (28%)
Consider diverse individual learning needs	17 (94.4%)	1 (5.6%)	13 (68.4%)	6 (31.6%)	10 (40%)	15 (60%)
<b>Total</b>	<b>99 (91.6%)</b>	<b>9 (8.4%)</b>	<b>98 (85.9%)</b>	<b>16 (14.1%)</b>	<b>109 (72.6%)</b>	<b>41 (27.4%)</b>

### 3.5 Appropriateness of assessment techniques used by the teacher

Observers have evaluated again the appropriateness of the assessment techniques used by the teacher.

Accordingly, 65.3% teachers at SD Negeri Tanjungsari I, 41.6% at SMP Negeri 26 and 48.8% at UPI lab school agreed that the assessment techniques used by the teacher was appropriate and the remaining observers disagree on the appropriateness as shown below in table 5.

Table 5: Observers response to the appropriateness of assessment techniques used by teacher

Evaluation Criterion	SD UPI Lab school		SD Negeri Tanjungsari I		SMP Negeri 26	
	Yes F (%)	No F (%)	Yes F (%)	No F (%)	Yes F (%)	No F (%)
Teacher does not use appropriate assessment techniques to judge the level of understanding of majority of students on core learning points	8 (44.4%)	10 (55.6%)	7 (36.8%)	12 (63.2%)	13 (52%)	12 (48%)
Teacher hardly uses assessment techniques to judge students' understanding	4 (22.2%)	14 (77.8%)	8 (42.1%)	11 (57.9%)	9 (36%)	16 (64%)
Teacher uses appropriate assessment techniques to judge the level of understanding of majority of students on core learning points	10 (55.6%)	8 (44.4%)	19 (100%)	0 (0%)	16 (64%)	9 (36%)
Teacher uses appropriate assessment techniques to judge the level of understanding of majority of students on core learning points at each step of the lessons.	12 (66.6%)	6 (33.4%)	16 (84.2%)	3 (15.8%)	7 (28%)	18 (72%)
Teacher uses appropriate assessment techniques conducted in the way each student can reflect individual unique learning to judge the level of understanding of majority of students on core learning	10 (55.6%)	8 (44.4%)	12 (63.2%)	7 (36.8%)	7 (28%)	18 (72%)
<b>Total</b>	<b>44 (48.8%)</b>	<b>46 (51.2%)</b>	<b>62 (65.3%)</b>	<b>33 (34.7%)</b>	<b>52 (41.6%)</b>	<b>73 (58.4%)</b>

### 3.6 Lesson objective achievement level evaluation

As a whole observers evaluate to what extent the lesson objectives was achieved/succeed. The result

showed that 59.6% observers at SD Negeri Tanjungsari schools, 58% at SMP Negeri 26 and 52.7% UPI lab school agreed that the lesson objectives was achieved as a whole but the remaining observers disagree on it.



Table 6: Observers general evaluation of the lesson objective achievement level by students

Evaluation Criterion	SD UPI Lab school		SD Negeri Tanjungsari I		SMP Negeri 26	
	Yes F (%)	No F (%)	Yes F (%)	No F (%)	Yes F (%)	No F (%)
lesson objectives achievement level ( as a whole)-After lesson conducted						
The lesson objectives are partially attained by no or few students	11 (61.1%)	7 (38.9%)	11 (57.8%)	8 (42.2%)	13 (52%)	12 (48%)
The lesson objectives are attained partially by majority of students.	11 (61.1%)	7 (38.9%)	14 (73.6%)	5 (26.4%)	20 (80%)	5 (20%)
The lesson objectives are attained by only some students	8 (44.4%)	10 (55.6%)	9 (47.4%)	10 (52.6%)	9 (36%)	16 (64%)
The lesson objectives are attained by majority of students	11 (61.1%)	7 (38.9%)	13 (68.4%)	6 (31.6%)	20 (80%)	5 (20%)
The lesson objectives are attained by all students	5 (38.5%)	13 (61.5%)	9 (47.4%)	10 (52.6%)	7 (28%)	18 (72%)
The lesson objectives are attained by all students and the lesson was inspiring ( make them to do or create something	11 (61.1%)	7 (38.9%)	12 (63.2%)	7 (36.8%)	17 (68%)	8 (32%)
Total	<b>57 (52.7%)</b>	<b>51 (47.3%)</b>	<b>68 (59.6%)</b>	<b>46 (40.4%)</b>	<b>87 (58%)</b>	<b>63 (42%)</b>

### 3.7 Over all evaluation of the lesson (summary)

As shown below the three lesson plan have general information. Objectives of the lesson plan are SMART\* and appropriate for student learning based on Minimum Learning Competencies (MLC). Lessons plan have appropriate assessment techniques that have a coherent link with the lesson objectives. Appropriateness of assessment

techniques used by the teacher was below 50% in SD UPI Lab School and SMP Negeri 26 that needs improvement but in SD Negeri Tanjungsari I it is about 65%. As a whole, the lesson objectives achievement /success level was evaluated. The success was 52.7% in SD UPI Lab school, 59.6% in SD Negeri Tanjungsari I and 26 58% in SMP Negeri.

Table 7: Overall evaluation of the lesson based on the criteria

Criterion	SD UPI Lab school		SD Negeri Tanjungsari I		SMP Negeri 26	
	Yes F (%)	No F (%)	Yes F (%)	No F (%)	Yes F (%)	No F (%)
Lesson plan includes necessary information	140 (97.2%)	4 (2.8%)	146 (96%)	6 (4%)	154 (77%)	46 (23%)
objectives of the lesson plan are SMART* and appropriate for student learning based on Minimum Learning Competencies (MLC).	108 (72%)	3 (28%)	110 (96.5%)	4 (3.5%)	123 (82%)	27 (18%)
Lesson plan has appropriate assessment techniques that have a coherent link with the lesson objectives.	99 (91.6%)	9 (8.4%)	98 (85.9%)	16 (14.1%)	109 (72.6%)	41 (27.4%)
Teacher use(implement) appropriate assessment techniques	44 (48.8%)	46 (51.2%)	62 (65.3%)	33 (34.7%)	52 (41.6%)	73 (58.4%)
As a whole, the lesson objectives are attained by students.	57 (52.7%)	51 (47.3%)	68 (59.6%)	46 (40.4%)	87 (58%)	63 (42%)

#### 4 CONCLUSION

In the observed instructions, students obviously gained opportunities to participate in dynamic classroom activities and discussions. The results of this study showed that the lesson plans in three schools include basic information such as lesson objectives, activities, assessment and teaching and learning materials; and the objectives prepared were SMART. Furthermore, lesson plan has appropriate assessment techniques that have a coherent link with the lesson objectives in all three schools. Matching assessment techniques with the lesson objectives will help to check if the intended objectives are achieved or not.

The result showed that performance assessment of the group work based on observation and judgment is dominantly used by the model teacher in all three open lessons. Observation is the primary assessment method, and immediate descriptive feedback is essential to improving student learning. Because each classroom forms its own culture, teachers play a powerful role as observers, and their professional judgement is valued and integral to quality classroom observation. Observation provides teachers in multilevel classrooms with an effective and efficient way to explore their students' thinking. Teachers learn about their students' strengths and areas in need of support and

development. Furthermore, classroom observation is valid and reliable when teachers are guided by targeted learning outcomes and clear criteria.

Since its introduction in early 2000s, lesson study has been viewed as a promising and powerful approach to professional development and school improvement in Indonesia. Lesson study and action research may be employed to improve it (Sagor, 2000). These movements reflect a fundamental shift of the teacher's role and profession. Since lesson study is implemented in these schools in Indonesia for many times, teachers are considered well developed professionally with regard to classroom assessment. As a result for these particular lessons, the investigation shows that classroom assessment techniques implemented by the teacher was below 50% in SD UPI Lab School and SMP Negeri 26 but in SD Negeri Tanjungsari I it is about 65%. Therefore further cooperative learning through lesson study is important in such schools to improve teachers' classroom assessment techniques.

The lesson objectives achievement by the student was above 50% in all three schools and it needs further improvement. To improve classroom assessment techniques, further cooperative learning through open lesson study should be practiced further. Because lesson study is a pillar in professional development of teachers, it should be widely implemented further.

## 5 ACKNOWLEDGEMENT

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# The Impact of Lesson Study on The Improvement of Mathematics Instruction

## *The case of UPI -primary lab school*

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**Abstract:** The purpose of this study was to examine the impact of lesson study on the improvement of Mathematics instruction. The study was guided with the following research questions. 1) what are the impacts of lesson study on Math teachers' professional development? 2) How lesson study influences student learning in Mathematics? The target populations of the study were all Math teachers and 81 students of three grade levels of UPI primary lab- school. To conduct this study direct observation of three open lessons, rating scale questionnaire and videotapes were the methods used to collect data. The data collected through questionnaire analyzed by calculating the percentage. We tried to transcribe the video recorded during the implementation of one open lesson by the schoolteachers and many observers as part of the data analysis. Finally, we applied qualitative analysis to summarize the data collected through questionnaire, videotape and observation. Results argue that participation in lesson study gives Math teachers an opportunity to: improve their knowledge of subject matter, knowledge of pedagogy and knowledge of their students learning. According to the data analysis, each cycle of lesson study has its own contribution to the improvement of Mathematics instruction by affecting teachers' professional development and students learning. As a result, we suggest that Math teachers should apply Lesson Study continuously by considering its impact on their professional development and students learning in order to learn more on students, strategies and materials.

**Keywords:** Lesson study, Mathematics instruction, professional development, student learning

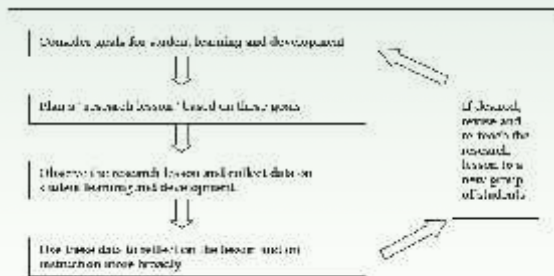
## 1 INTRODUCTION

This qualitative study is part of the ten months third country-training program (TCTP) from February 2014 to November 2014 on capacity development of Mathematics and Science teacher educators of Ethiopia held at Indonesia University of Education. Japan International Cooperation Agency (JICA) supported the training. During this training, Lesson Study was one of the main activities of which the first author of this article expected to have experience. For this reason, the author of this article tried to observe and participate in the implementation of lesson study in learning process in many schools around Bandung -Indonesia. The school under consideration in this study was the one in which around three Mathematics and one Science open lessons conducted and the researcher was involved throughout the three cycles of lesson study such as plan -do - see. The researcher managed to collect data and share experience with the teachers and experts on the way to implement lesson study in Mathematics classrooms of different grade levels. The result of this study will be more significant to the lecturers of Indonesia University of Education to look back on the way of implementing lesson study

in different schools of Indonesia. In addition to this, the study is more significant to the schoolteachers to look at the effectiveness of lesson study to improve their Mathematics instruction and assure their students learning. Last but not the least; the study will be helpful to the researcher as the participant of the Triangular cooperation Training Program for teacher educators among Indonesia, Japan and Ethiopia as the base to implement lesson study in Ethiopian schools.

Lesson study can be defined as a teacher-led instructional improvement process in which a group of teachers are expected to work collaboratively to: formulate goals for student learning, plan a lesson, teach and/or observe the lesson to collect evidence on student learning, reflect on the gathered evidence, revise the lesson for improvement and reteach the revised lesson when necessary (Lewis, 2002). This means during lesson study, teachers have a means for planning, implementing and conferring with their colleagues in school based or subject based approach. In general, from the above definition the Lesson study cycles are as follows.

Figure 1-The brief Summary of Lesson study cycle



Educational standards suggest that students should engage in complex problems that give rise to comprehensive Mathematical understanding (National Council of Teachers of Mathematics, 2000). As a result, Math teachers will have to shift their pedagogy of memorization, repetition, and recitation of correct answers to developing their students' reasoning and communication skills by actively engaging them in the process of teaching and learning as well as problem solving. (Smith, 2001). Professional development helps Math teachers to make pedagogical decisions and strategies for effective instruction in order to understand the Mathematics they teach and the effectiveness of the teaching materials they prepared to teach any particular topic of Mathematics. The most commonly used forms of professional development in different countries include short sessions at meetings, one-to-two day school-based workshops on specific topics, or two-to-three-week workshops in the summer. However, another form of professional development called Lesson Study originated in Japan is being implemented in different countries by different degrees of implementation. Indonesia is one of the countries implementing lesson study for more than ten years. Therefore, this study aimed to examine the impact of lesson study to improve Mathematics instruction in general and its impact on teachers' knowledge of subject matter, pedagogy and student learning in particular. Many educational reform literatures suggest that knowledge for teaching Mathematics is essential to learn how to teach the subject matter in order for students to understand it better (Smith et al. 2005; Hill et al. 2005). According to the National Research Council (2001) an academically rich environment begins with teachers who are knowledgeable in Mathematics, knowledgeable of students' ability and knowledgeable of instructional strategies. Knowledge of subject matter with an understanding of instruction results in a highly

effective teacher (Phillips 2003; Hill et al. 2005). A study conducted by Karim (2006) stated that the implementation of lesson study has the following impacts to improve the quality of Mathematics instruction, namely: 1) It improves the collaboration, collegiality and communication among teachers 2) the implementation of research lesson is opened and observed by internal and external observers to be criticized 3) it empowers Math teachers' association. In this study, we tried to examine whether or not participation of Math teachers in lesson study provides opportunities for them to improve their knowledge of subject matter contents, knowledge of their students' learning and knowledge of different strategies of teaching Mathematics. For that purpose, the research questions are as follows:

Research questions:

1. What are the impacts of lesson study on Math teachers' professional development?
2. How does lesson study influence student learning in Mathematics?

## 2 METHODOLOGY

The target populations of this study were all Math teachers and 81 students of UPI- primary Lab School of three grade levels such as grade three, five and six found inside the campus of Indonesia University of Education. To conduct this study the researcher used direct observation of three open lessons, questionnaire and video tape to collect the data. A questionnaire was prepared for Math teachers who participated in lesson study to examine its impact on their subject matter knowledge, pedagogical knowledge and students' learning within the three cycles of lesson study such as planning, implementation and reflection. The questionnaire was prepared in English language and translated into Indonesian language to make it understandable by all teachers. Three open lessons were observed and two of them were videotaped with the intention of examining how lesson study influences students' learning and teachers' professional development. The Math teachers of the school conducted three open lessons in different grades and different times in collaboration with many teachers from different schools, the TCTP participants from Ethiopia and some lecturers of Indonesia University of Education. The details of the open lessons are shown in the table below.

Table 1: The details of the conducted open lessons  
The Numbers of teachers tabulated in **Table 1**

Date	Grade	Number of Students	Number of teachers /observers	Topic of the lesson
28/03/2014	5	27	29	Prisms and pyramids
12/05/2014	3	30	28	Measuring Area of squares and Rectangles
25/08/2014	6	24	18	flow rate of Water

have participated during the implementation and debriefing sessions of each corresponding open lessons. However, during the planning session of each open lesson the number of teachers was not as much as the other sessions. The researcher’s observation and the comments given by the observers of each open lesson during the planning and reflection cycle are also part of the data for this research. The data collected through questionnaire from the schoolteachers analyzed by calculating the percentage as shown in **Table 2, Table 3 and Table 4**. The teachers were given free choice to strongly agree (SA), agree (A), undecided (UD), disagree (DA) and strongly disagree (SD) up on the given suggestions and their responses are tabulated. We tried to transcribe the video recorded during the implementation of one open lesson by the schoolteachers and many observers as part of the data analysis. Finally, we applied qualitative analysis to summarize the data collected through questionnaire, videotape and observation.

### 3 RESULT

To simplify the presentation of the data obtained through questionnaire, observation and video tape from the teachers and students who participated in lesson study, the researcher tried to examine the impacts of the three cycles of lesson study separately as follows.

### 3.1 Planning Cycle

To examine the impact of the planning cycle of lesson study up on the improvement of Mathematics instruction, the teachers were asked whether planning in a group improved their knowledge of the subject matter, knowledge of pedagogy, their confidence about their lesson and their knowledge of preparing effective teaching aids for any particular topic of Mathematics or not. The responses of the teachers are tabulated below

**Table 2: Mathematics teachers’ response on the impact of planning cycle of lesson study on their instruction (APPENDIX 1)**

**Table 2** shows that the planning cycle of lesson study helped the Math teachers of the school to: improve their knowledge of the subject matter, their pedagogical knowledge, plan their lessons independently, develop their confidence in teaching Mathematics and develop effective teaching materials that support productive exchange of ideas among students. This supports the researcher’s observation that during the planning cycle many ideas were coming from different participants that can improve the lesson in terms of the possible teaching strategies, possible teaching materials for every lessons and anticipations of students’ questions and answers.

### 3.2 Planning Cycle

Use 13-point type for the subtitle, aligned to the center, linespace exactly at 18-point with bold and italic font style. The initial letters should be capitalized.

#### 2.2.3 Doing/Implementing Cycle

The data collected through videotape and observation of the open lessons indicated that the implementation cycle of lesson study was helpful for the participant teachers to observe the effectiveness of their planning up on student learning critically. At this cycle, each participant

Teacher /observer had the opportunity to observe the overall activities of the students and evaluate

**Student 2:** Let me cut the larger one and overlap them.

**Student 3:** We do not have to cut it let us put the square on the top the rectangle and then compare.

**Student 1:** In this way, we cannot answer the question. (Such conversation like this continued in each group of the students)

**Teacher:** who can tell me which figure has the larger area? I want the other students to pay attention while the student explains the answer to this question.

**Student 4:** Let us put the square over the rectangle. As you can see, the rectangle and the square have extra parts when we overlap them. However, as to me the rectangle has more extra part than the square. Thus, the rectangle has the larger area than the square.

**Teacher:** I will give you another activity related to this. I hope you will enjoy it and answer the above question correctly.

During the above discussion, most of the students were confused. As a solution to the students' confusion, the teacher offered small unit squares for each group in which the area of each square was one square centimeter. The interaction among the students, the teacher and students was as follows.

**Teacher:** I have many unit squares for you. Each group representative can come and take these squares. The area of each square is one square centimeter. I want each group to cover both the rectangle and the square using the small squares and find their areas. Please work together by dividing your tasks among the group members.

**Student 4:** I have a question teacher. How the area of this square can be one square centimeter? It looks big. May I measure its dimensions using this ruler?

**Teacher:** No, please consider its area to be one square centimeter.

**Student 1:** How can we cover the rectangle and the square using these small squares?

**Student 3:** we can attach the small squares in rows and columns carefully. Let us do this being in two groups. One group should cover the rectangle and the other group covers the square.

**Teacher:** please start doing your activity you have 20 minutes to complete your task.

**Student 2:** I think student 3 brings a very good idea. Look the other groups are working in the same way. So let us continue and keep our time.

In the above way, each group tried to complete covering the given rectangle and the square using the unit squares in order to find the areas. During the group discussion, the teacher was observing his students activities and reminding them the time left to finish by moving around them. When the time was over, the teacher asked his students to stop and pay attention to whole class discussion in the following way.

**Teacher:** Well done students, this is the time to stop and pay attention to the class discussion. Now is the

time for you to present your finding from the given activity. Who can tell us the area of the given rectangle and the square? Which of them has the larger area? Raise your hand I will give you chance. Okay student 9.

**Student 9:** Thank you sir, we already knew the answer by counting the number of unit squares used to cover the rectangle and the square. Based on this, we found that the area of the rectangle is 50 square centimeter and the area of that of the square is 64 square centimeters. This shows the rectangle has the larger area than the square.

**Teacher:** you did well, thank you. Do we have another means students?

**Student 14:** Yes, We do not need to count all the unit squares to find the areas. Instead of that, we can simply count the number of unit squares found in one column and one row of the rectangle as well as the square then multiply them correspondingly. This is the shortest method.

**Teacher:** Can we apply student 14's idea to find the area of the given rectangle and the square students?

**Students together:** Yes, we can teacher.

**Teacher:** It is great job students. What can we conclude from student 14's idea?

**Student 20:** Thank you sir, we can conclude that the area of a rectangle = length x height and the area of the square = length x length=length<sup>2</sup>.

After the activity, the teacher asked the students to find the area of their table, white board and the floor of their classroom using the rectangle or the square areas as the base.

The students tried to find the area of the required table, white board and the floor.

The above script shows that the students were highly involved in the process of learning. This implies that the planning session of the open lesson had very good impact to involve all of the students. As a result, we can say that lesson study has significant impact on student learning.

### 3.3 Debriefing /Reflection cycle

To examine the impact of the reflection cycle of lesson study up on the improvement of Mathematics instruction, the teachers were asked whether the reflection cycle of lesson study helped them to assess their lessons effectively, analyze their lessons on how much they involve their students or not. The suggestions and the responses of the teachers to the given suggestions are tabulated below (APPENDIX 2)

The responses of the teachers for each suggestion as tabulated in **Table 3** shows that the reflection cycle of lesson study helped the Math teachers of the school to get important feedback about their students learning, assessment and involvement. This supports the researcher's observation that during the reflection cycle each observer were given the opportunity to explain what he/she learnt from the lesson, what was going well and what improvement could be considered depending on students learning and the effectiveness of the teaching materials prepared during the planning cycle. As a result, many constructive ideas were coming from each observer that can improve student learning and teachers' professional development. Here are some of the comments given by some observers during the reflection session of the third open lesson on the rate of water flow.

“According to my opinion, most of the students were doing the given activity by sharing tasks. For example, when one student started to fill the bottle with water the other student prepares the stopwatch while the other members record the time. I liked their cooperation. When we look their results, each group recorded different time to fill the given materials. However, they did not explain the reason for the difference. Thus it would be better if the students are asked to explain the reason for the different time.” (Observer 1)

“I liked the students' interaction in doing their activity together. As we can see from each group presentation, each group recorded the time taken to fill the given materials and the volumes are given. However, they never calculated the rate of water flow. Thus the lesson could be improved by making students to calculate the rate of water flow.” (Observer 2)

In addition to this, the researcher asked the participant teachers whether they have interest to apply lesson study in their classrooms or not. The given suggestion and their responses are tabulated below (APPENDIX 3)

The response of the teachers tabulated in **Table 4** shows that since lesson study has great impact to their professional development, they want to apply it continuously. At the end the questionnaire, one open-ended question presented for the teachers to write any additional impact of lesson study on the improvement of Mathematics instruction. One of the teachers stated the following additional idea.

“Lesson study has benefits for learning more structured knowledge than the traditional way of teaching and learning, so that learning is so much fun, and learning objectives are achievable.”

## 4 DISCUSSION

In summary, the data collected through questionnaire, videotape and observation revealed that lesson study helped Math teachers to improve their instruction by improving their content knowledge, pedagogical knowledge and their knowledge of student learning. With respect to their content knowledge, the case indicates understanding of the Mathematical problems with different perspectives based on the feedback obtained from student learning and the comments given by their colleagues during the planning and reflection cycles of lesson study. With respect to their pedagogical knowledge, the case indicates that during lesson study the Math teachers have the opportunity to select, apply and evaluate different teaching strategies and teaching materials. As a result, they have good opportunity to share experience on the effectiveness of the teaching strategies and teaching materials for any particular topic of Mathematics. With respect to their knowledge of student learning, the case indicates that during the planning cycle of lesson study the groups of teachers tried to anticipate about student responses for any problems raised during the implementation cycle. This helps the teachers to compare their anticipation with the student responses and learn more about student thinking in detail by predicting their students' responses and questions. In relation to this, Chaona and Inprasitha (2013) claimed that Lesson Study supports teachers in assessing students' learning by: listening how students describe their work, setting problem situation, asking students to communicate their learning through drawings, actions, diagrams, writing and discussing briefly. In general, this study supports the study conducted by Lewis et al (2009) which claimed that participating in lesson study affects the improvement of Mathematics instruction through three pathways namely: changes in teachers' knowledge and belief, changes in professional community and changes in teaching-learning resources. In addition to this, Meyer and Wilkerson (2011) found the following three windows of opportunities by which lesson study affects teachers' knowledge in teaching Mathematics, namely, lesson plan or the task to be implemented, discussion the teachers had during the planning and reflection cycles and the teachers' level of anticipating students' questions and responses.



## 5 CONCLUSION

Results of this study argued that participation in lesson study gives Math teachers an opportunity to: improve their knowledge of the subject matter, knowledge of pedagogy and knowledge of their students learning. According to the data, each cycle of lesson study has its own contribution to the improvement of Mathematics instruction by affecting teachers' professional development and students learning. As a result, we suggest that Math teachers should apply Lesson Study continuously by considering its impact on their professional development and students learning in order to learn more on students, strategies and materials. During the planning session the observers should be given different tasks and observe intentionally on the given task to learn more from the implementation of the lesson

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**APPENDIX 1**

**Table 2: Mathematics teachers’ response on the impact of planning cycle of lesson study on their instruction**

No	Aspects of planning	SA		A		UD		DA		SD		Total	
		Number	%	Number	%	Number		Number		Number		Number	%
	Planning in a group broadened my knowledge of the Mathematics	4	66.67		33.33							6	100
	Planning in a group broadened my knowledge of how to teach mathematics more effectively.	4	66.67		33.33							6	100
	Planning in a group helped me in planning my future lessons independently.	3	50		50							6	100
	Planning in a group increased my confidence about my lessons	3	50		50							6	100
	Planning in a group helped me to develop effective teaching materials that support productive exchange of ideas among students	4	66.67		33.33							6	100

## APPENDIX 2

Table 3: Teachers responses on the impact of the reflection of lesson study

No	Suggestions	SA		A		UD		DA		SD		Total	
		Number	%	Number	%	Number		Number		Number		Number	%
	The feedback I received during the debriefing sessions from my peers was helpful to my planning and student learning	5	83.33		16.67							6	100
	Revising lessons after teaching helped me to plan more effectively for the re-teaching.	6	100		-							6	100
	Analyzing each other's lessons during the debriefing helped me learn to assess lessons more effectively.	4	66.67		33.33							6	100
	The debriefing sessions were helpful in analyzing my lessons on the way to involve all my students.	4	66.67		33.33							6	100

## APPENDIX 3

Table 4: Teachers response on their interest to apply lesson study continuously

No	Suggestion	SA		A		UD		DA		SD		Total	
		Number	%	Number	%	Number		Number		Number		Number	%
1	Since Lesson Study has great impact to my professional development, I want to apply it continuously.	3	50		50							6	100

## Using Lesson Analysis as Teacher Self-Reflection at Daily Lessons

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**Abstract:** Lesson Analysis has been used as part of teacher training programs to improve teacher’s ability to sharpen teachers’ ability to analyze their own lesson. According to the characteristics of lesson analysis, it can be used as teacher reflection on daily basis as well (Hidayat: 2013). Teacher reflection is widely known as one of essential parts to encourage teacher’s awareness on point of view on on-going teaching. The research is aimed to investigate how lesson analysis as teacher’s reflection changes on teacher’s lesson plan and practices in daily lessons. Framework of lesson analysis used is emphasizing on quantitative and student-teacher verbal communication according to Hidayat & Hendayana (2013). A chemistry-high school teacher with 12 years of teaching experience applied as single sample research during eight lessons. Video tapped and transcript are employed on each lesson, while retrospective analysis used at end of every single meeting to gain revised planning and next lesson plan. Lesson analysis is given once after next lesson plan is made, while comparison of revised teacher’s lesson plan after treated with lesson analysis with previously is indicated as influence of lesson analysis as teacher’s self reflection.

**Keywords:** Lesson Analysis , Teacher’s Self-Reflection, Chemistry Lesson

### 1. INTRODUCTION

One of Indonesia government efforts increased the quality of education was by improving of teachers’ professionalism. As express in the UU No 14 year 2005 about the improvement of teachers’ and lecturers’ professionalism (Hendayana, 2013). Government did many teacher training programs such as lesson study. In lesson study activity, there was three steps i.e plan, do, and see. In see session, teachers make analysing and get reflection from learning activity. Teachers’ ability to analyze their lesson engage not only in lesson study activity but also in their daily lesson. Many various ways for teachers develop their ability to analyze their daily lesson, one of them by using lesson analysis framework. Lesson analysis is a way to see, hear, describe, discuss, and understand the interactions among teacher and students that comprise a lesson (Romagnano, Evans, & Gilmore, 2008).

Many expert develop lesson analysis framework i.e Fernandez, Kuno, Matsubara, and Hidayat & Hendayana. By using lesson analysis

framework, teacher make self reflection for improving the quality of learning. Matsubara (2013) stated that one of the good things of lesson analysis is that method allow us to realize how we teach by ourselves, not like being told by someone (like a supervisor). Hidayat & Hendayana’s framework was one of lesson analysis framework that focusing on individual lesson as the unit of analysis. Based on lesson analysis framework, teachers were able to address in considerable depth many aspects of teaching. Teachers used lesson analysis framework to make self reflection for their daily lesson. It will solve their learning problems that occur more detail. In daily lesson, teachers will improve and enhance their sensitivity to their lesson. Using lesson analysis performed on the stages of learning will get a more complete picture of the obstacles and progress that occurs in the classroom. And then the teacher will get the new knowledge to do learning process better, by preparation, domination of matter, attitudes, and problem solving.

## 2. RESEARCH METHOD

In 2014, a chemistry teacher with 12 year experience is observed in her daily classroom. Series of eight lessons were video-tape recorded, transcribed, and analyzed using teacher and student evaluating lesson analysis by Hendayana and Hidayat framework (2013). Lesson analysis system focus on student’s verbal responses in classroom discourse.

This study was conducted in one of Senior High School(SMA) in Bandung. The approach used in this study is a qualitative approach. The method used in this research is descriptive method of analysis.

## 3. FINDINGS AND DISCUSSIONS

Teacher’s self reflectionby analysing transcript gained fromseries of eight chemistry lessons. The topic of chemistry lesson as seen on table below.

Transcript Classification	Chemistry Lesson
1	Solubility and solubility constant product concept
2	Relation between solubility and solubility constant product concept
3	Precipitation Reaction Concept
4	The Common Ion Effect and The Effect of pH on Solubility Concept
5	Types of Colloid Concept
6	Properties of Colloid Concept
7	Application of Colloid in Daily Life
8	Application of Colloid in Daily Life

The transcript of series of eight chemistry lessons will be inputted into lesson analysis framework in Mic. Excel format then it will be classified into different categories. Lesson analysis is given once after next lesson plan is made, while comparison of revised teacher’s lesson plan after treated with lesson analysis with previously is indicated as influence of lesson analysis as teacher’s self reflection.

### ➤ Teacher’s self reflectionon on lesson 1

In the analysis of transcript, it is gained teacher’s self reflection about time allocation of experiment task, revised of student sheet, and revised of lesson apperception.

*G (KM) : “Untuk selanjutnya yaa, untuk pertemuan selanjutnya, kita mulai melihat dari hasil LA ini sebaiknya waktu praktikum yaa dibatasi“.*

*G (KM) : “Aaaa prosedur kerja walaupun di ppt ini karena mungkin ini, ini bukan, memang*

*ini perhitungan ya, jadi kalau perhitungan memang harus ada prosedurnya, tapi kalau misalnya yang bukan perhitungan anak-anak akan menemukan sendiri, kekurangannya lagi pada siswa kurangnya. Kemudian perlu adanya keselamatan dilaboratorium”.*

*G (KM) : “Jadi Untuk masukan RPP disitu harus ada jadi prosedur untuk memasukkan soal yang akan di uji sedikit demi sedikit itu karna siswa itu tidak ada takarannya jadi berlebih ,sesendok ada yang sesendok-sendok, ada yang sedikit-sedikit jadi tidak disamakan gitu, harusnya ada perintah dari guru bahwa cara memasukkan bahannya harus sedikit demi sedikit”.*

### ➤ Teacher’s self reflectionon on lesson 2

In the analysis of transcript 2, it is gained teacher’s self reflection about revised of lesson apperception and revised of student sheet.

*G(KM) : “”Mungkin siswa udah mulai, jadi udah mulai tau yaa, kemarenkan apersepsi pertama persamaan reaksinya kurang, jadi kita tambahkan persamaan reaksi.”.*

*G (KM) : Yaaa, tadi kan kita harus apa, apersepsi yaa di awal trus materi ini tetap saja harus banyak latihan siswanya, istilahnya setelah jadi soal-soal dari yang termudah yang tersulit, jadi kebiasaan kalau mudah nanti step by step yaa pemikiran siswa nya jadi kalau yang mudah sudah bisa tapi yang sulit pemecahannya juga bisa, soal juga harus diperhitungkan dalam KSP ini dan tetap yaa harus dihubungkan ke kehidupan sehari-hari supaya siswanya tidak jenuh akan belajar KSP”.*

### ➤ Teacher’s self reflectionon on lesson 3

In the analysis of transcript 3, it is gained teacher’s self reflection about revised experiment procedure, give laboratory savety warning, demonstration of experiment tool by teacher, and revised lesson apperception.

*G(KM) : “Hhaaakkk aaa lesson analysis kan disini masih ke guru ya yang mendominasi kita buatn mungkin oooo ditambahkan prosedur yang bahasanya bisa dimengerti oleh siswa ya pada LKS. Terus apersepsi kita tambahkan satuan-satuannya untuk mengingatkan bahwa dari mili ke liter atau dari apa ....untuk mempermudah siswa dan diingatkan masalah menggunakan alat bagaimana*

*pengukuran yang baik itu bagaimana dan yang terakhir adalah kita harus mencantumkan keselamatan kerja di LKS .... Mungkin ya seharusnya dileb juga ada ya. ini kan leb nya masih perbaikan perbaikan. itu saja mungkin.”.*

➤ *Teacher’s self reflection on lesson 4*

In the analysis of transcript 4, it is gained teacher’s self reflection about revise apperception, revise experiment procedures, and check supporting media.

G (KM): *“Ya..... disini kita harus ada penguatan konsep pada azaz Le Chatelier ya oooo pada penguatan apersepsinya dikeseimbangan ...keseimbangan ya ....terus ada oooo analogi ...nah analogi jungket.”*

G (KM): *“Hhaaaakkk aaaa supaya siswa paham ya di analogi kan karna memang ini abstrak ya buat siswa oooo pelajaran ini ....terus perbaikan tetep diprosedur LKS ....mungkin LKS nya disitu terlalu banyak oooo itu nya ya. terus yang terakhir adalah infokus dan LCD.”*

➤ *Teacher’s self reflection on lesson 5*

In the analysis of transcript 5, it is gained teacher’s self reflection about management of lesson time in each task.

Guru(KM) : *“Pembelajaran yang dilakukan tujuannya anak dapat membedakan jenis-jenis koloid, cuma pas fasa terdispersi dan medium pendispersi masih bingung anaknya. Jadi itu.. naah ini di menit-menit pertama sampai menit ke ini ya..ke dua puluh ya. Saya bawa ke pelarut dan terlarut masih itu juga sehingga kita harus banyak bagaimana solusi anak-anak memahami apa itu terdispersi dan medium pendispersi. Tapi di menit ke empat puluh lima disini sudah sesi kelompok mereka sudah mulai berkolaborasi dan itu memang disini sampai ke menit ke enam puluh mereka sudah mulai mengeksplor diri. Untuk liofil dan liofob udah jelas dengan pengamatan cat dan lem. Anak-anak terlihat ini dan saya bisa mengaplikasikan ke kehidupan sehari-hari. Cuma pas yang di medium dan fasa terdispersi anak-anak masih bingung. Tapi untuk pembelajaran yang saya bawa jadi..biasanya saya sama rekan-rekan disini untuk memberikan pembelajaran koloid itu hanya untuk menghafal aja ya tapi sekarang anak-anak bisa meneliti ooooh ini dari keadaan yang nyata anak-anak lebih bisa memahami. Itu aja.”*

Guru (KM) : *“Iyaa..peraga nya kan banyak waktunya nggak cukup jadi nggak fokus yah. Jadi nanti bisa dibikin lebih dipikirkan lagi ya. Baik itu dalam pengerjaan LKS nya, dalam segi penyampaian presentasi di depan mungkin bisa dipertimbangkan lagi.”*

➤ *Teacher’s self reflection on lesson 6*

In the analysis of transcript 6, it is gained teacher’s self reflection about giving affirmation in each task.

Guru (KM): *“Pembelajaran kali ini siswa sudah mulai berpikir sendiri dan saya bisa mengarahkan siswa menemukan sendiri. Saya hanya sebagai penguatan-penguatan konsepnya. Ya istilahnya mereka sudah benar, tapi belum sempurna maka ada penyempurnaan-penyempurnaannya. Terus disini anak-anak sudah mulai suka untuk materi sifat-sifat koloid, tapi disini masih ada yang saya tetapi cuma pada penekanan-penekanan atau penarikan kesimpulan aja dan penguatan konsep. Terus pada percobaan yang efek tyndall itu siswa memang masih kurang paham dalam menghamburkan cahaya itu padahal bahwa koloid itu dapat menghamburkan cahaya sedangkan campuran yang lain seperti kopi itu cahaya tidak tembus tetapi kalau di air gula dia itu akan diteruskan.. itu kan terkait pada ukuran partikel..disitu anak masih bingung.”*

Guru (KM) : *“Iyaaa jadi diefek tyndall aja bahwa itu dikaitkan dengan ukuran partikel aja. Tapi kalau yang lainnya mereka udah paham kan ada gerak brown, adsorpsi, elektroforesis, koagulasi, dan dialisis. Kalau gerak brown emang abstrak ya jadi tidak bisa diapa..digambarkan di amati tapi kenapa si koloid itu gerak brown karena adanya tumbukan partikel-partikel koloid itu berarti pada penekanan konsepnya juga. Tapi secara keseluruhan anak-anak bisa paham berhubungan dengan efek Tyndall, gerak brown, adsorpsi, elektroforesis, koagulasi, dan dialisis. Itu aja mungkin.”*

➤ *Teacher’s self reflection on lesson 7*

In the analysis of transcript 7, it is gained teacher’s self reflection about revised experiment procedure and revised lesson apperception.

Guru (KM): *“Akan mengubah apa sistem prosedur yah. Prosedur, jadi kita tidak diberikan prosedur, tapi siswa membuat sendiri yah.”.*

G(KM): “Apa aja yah nanti, supaya siswa menarik apah, menggali yang kemarin-kemarin sudah terjadi.”

➤ *Teacher’s self reflection on lesson 8*

In the analysis of transcript 8, it is gained teacher’s self reflection about improve student ability in class discussion and need to predict student’s response.

Guru (KM) : “Iya ada perbedaanya, namun saya juga melihat saya masih lemah untuk mengajak siswa diskusi setelah saya meminta siswa ke depan untuk mempresentasikan hasil yang telah mereka buat. Jadi kurangnya diskusi kelas ya, aa enakya”.

G(KM) : “Terus siswa tidak lagi banyak mengalami kesalahan dalam prosedur karena mereka yang memprediksi sendiri hanya saja dengan seperti itu mereka belajar kesalahan yang mereka lakukan ketika prediksinya tidak sesuai dengan yang mereka lakukan”.

Based on series of eight lessons, teacher make self-reflection by using lesson analysis framework in each lesson. Teacher self-reflection can impact from one lesson to another lesson to give improvement for learning process. This study was gained teachers self reflection about concept’ affirmation in apperception, time management, and experiment procedures.

#### 4 CONCLUSION

By using lesson analysis, teachers make reflection of learning process, understand the effectiveness and quality of learning and finding effective ways to help students for developing their competence. Teachers can solve their learning problems that occurred with more detail. Thus, that caused improvement and enhancement of learning knowledge. In addition, teachers also find appropriate learning materials for certain materials due to more complete picture of the obstacles and progress that occurs in the classroom. Then teacher will get a variety of new knowledge to implement their learning process better, through preparation, material domination, attitudes, and problem solving. This is in accordance with the opinion of Santagata and Angelici (2010) states that the framework lesson analysis designed to assist teachers in learning to reflect success in teaching. Lesson analysis gives teachers a variety of views to observation, reflection, and the study of learning in the classroom.

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# The Development and Application of Electronic Portfolio Using Lesson Study for Improving Lecturers' Professionalism in Cell Biology Teaching and Learning

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**Abstract:** *Abstract:* The purpose of the study was to develop and implement electronic portfolio based Lesson Study to improve lecturers' professionalism in Cell Biology teaching and learning. The present study involved 6 lecturers and 11 senior students involving in the 14 meetings Lesson Study process, implemented in two different classes. The activities were observed from the development and the implementation of the e-portfolio in form of integrated assignment in lesson plan. The data of the study were obtained from the e-portfolio implementation to the students as a process and evaluation, the assumption questionnaires, and the lecturers' structured interview towards the Lesson Study. The data were analysed by descriptive qualitative method and the students learning results attained from the quiz score. The results of the study related to the development of the e-portfolio through the implementation of the Lesson Study revealed several suggestions; (1) the colour and feature, (2) the uploading deadline should be fixed, (3) the format of the data should be in PDF or Ms. Word. The results of the development based on the evaluation were found that the e-portfolio components consist of (1) user page, (2) profile, (3) friends, (4) private portfolio, and (5) assignments uploading deadline. The results of the e-portfolio implementation to support lecturers' professionalism showed that there was an ability improvement in terms of (1) planning learning activities including the e-portfolio assignment planning, (2) implementing IT skill during learning activities, (3) evaluating the students' works, (4) creating a good communication between lecturers and students, (5) identifying the students' problems. The learning results which were observed from the quiz score improved 16.44% beginning from the first meeting to the seventh meeting.

**Keywords:** e-portfolio, lesson study, lecturers' professionalism, cell biology.

## 1 INTRODUCTION

The implementation of technology to assist the learning evaluation technique in higher education level is massively used to monitor the students' ability in learning as well as to enhance the lecturers' professionalism in integrating IT. The form of the evaluation that might be able to integrate IT and encourage the students' improvement and the lecturers' capability is e-portfolio (Barret, 2000). E-portfolio popularity has been begun from its development as an evaluation instrument for the recent ten years (Tartwijk, *et al.*, 2007). As Information and technology (IT) has been developed better, portfolio has been developed as well to become electronic portfolio (e-portfolio) to facilitate the evaluation process especially in education world. However, as a relatively new facility, e-portfolio cannot be directly used and might not directly affect to the improvement of the students' academic ability (Kwok, 2011). It is because there are many factors that contribute e-portfolio successfulness as an

evaluation instrument to enhance the students' and the lecturers' ability during teaching and learning process. Chau and Cheng (2010) reported that e-portfolio implementation is basically able to assist to develop the students' ability. It is in line with Abiding and Saleh's (2010) statement that e-portfolio was able to encourage the students to become independent students especially in planning, performance, and evaluation. As for the lecturers, the implementation of e-portfolio might ease to improve their ability to recognize the students' potential through their uploaded and exhibited assignments on e-portfolio. In addition, the implementation of IT, like e-portfolio, becomes an important point to be integrated in learning process to improve the lecturers' competence (Umar and Yusoff, 2014). Therefore, the development of evaluation instrument such as e-portfolio which is integrating IT is categorized as a competence that can improve the lecturers' professionalism.

The implementation of e-portfolio as an evaluation instrument needs to be developed so that



it can be applied properly in order to reach the goal of the learning. One way to optimize the implementation of e-portfolio is through lesson study involving lecturer team in the application. It is because the systematic lesson study stages, namely plan, do, and see, are believed to be able to improve the learning process quality. Thus, the lesson study performance is aimed at developing and implementing e-portfolio as well as to improve the lecturers' professionalism in teaching, especially for those who are directly involved as the lesson study team. As the implementation of lesson study in Indonesia, Marsigit (2007) stated that it was introduced in 2001 through IMSTEP-JICA Project program and has been applied ever since. A lesson study which is begun with team grouping makes the learning activity be able to improve the lecturers' professionalism directly in terms of performance, materials, and evaluation process (Holmes, 2013), as well as to develop the evaluation instrument on learning such as e-portfolio.

The developed and implemented e-portfolio through the lesson study activity is one of the efforts to solve the students' difficulty in comprehending the lecture materials, including Cell Biology subject. As a prerequisite subject in Biology department, Cell Biology subject is considered as a difficult subject to be comprehended by the students. The abstract materials make it hard to be understood. By using different way, Veselinovska, et al. (2011) state that Cell Biology difficulty level is quite high, thus, it needs a specific technique and method developed by lecturers to enhance the students' active participation and learning motivation. The development and the implementation of e-portfolio through the lesson study is an alternative problem solving to deal with the difficulty in learning Cell Biology. The involvement of the lesson study in the learning process is necessary because the e-portfolio was developed and implemented based on the characteristics of the subject itself.

Regarding to the references above mentioned, it is necessary to know how lesson study can be used to develop and implement e-portfolio so that it can improve the lecturers' professionalism in Cell Biology teaching and learning. Therefore, the purpose of the present study was to develop and implement e-portfolio to improve the lecturers' professionalism in Cell Biology teaching and learning.

## 2 PARTICIPANTS

The present study was involving several lecturers and university students taking Cell Biology subject by developing and implementing e-portfolio through the lesson study activity. There were 52 students involved in this study who were divided into two parallel classes, namely A and B, while the lesson study team involved 6 lecturers and 11 senior students as the team member. The lecturers who were involved consisted of 3 senior lecturers, who have been teaching for more than 10 years, and 3 junior lecturers, who have been teaching less than 10 years. All of the lecturers are IT illiterate in order to support the learning process even though they have tried it in a simple and standard way. As most of the students have already familiar with IT and utilize it to communicate not to support their learning.

## 3 RESEARCH PROCEDURE

The initial development of e-portfolio was conducted by arranging its component on e-portfolio web consisting of user page, profile, friends, and private portfolio. The result of the initial development was discussed in the lesson study activity especially in the first planning stage in team. Then, it was followed by do and see as the reflection to implement e-portfolio in learning.

The implementation of Cell Biology learning through Students Team Achievement Division (STAD) method was carried out through several activities, like brief explanation, group work, discussion, quiz, and giving reward to a group or a student who achieve better than others. The increasing of the students' quiz achievements was a successfulness indicator of the lecturers' professionalism improvement in improving the learning quality.

The lesson study team consisted of six lecturers from Biology department and eleven students of seventh semester taking thesis research. The team members consisted of lecturers from similar major and experienced lesson study program in 2010-2012. Three lecturers of the team once became model lecturer regarding their subjects. Plan-Do-See cycles were conducted for seven times for each class, so there were fourteen lesson study cycles conducted in two classes during the similar Cell Biology subject. The cycle of the lesson plan was adapted from Smith (2010).

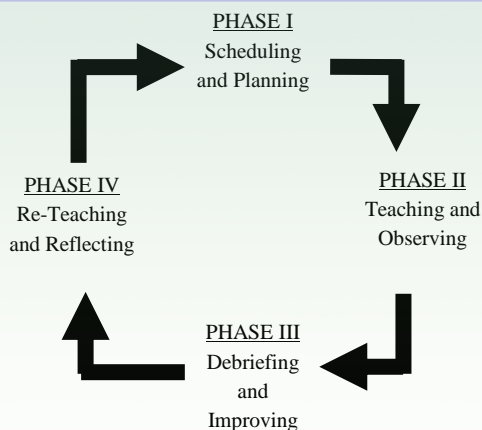


Fig 1. The cycle of lesson study (Smith, 2010)

Based on the arranged, agreed, and conducted schedule as well as referring to the above figure 1, the lesson study activities are presented on the following Table 1.

Table 1 The Lesson Study Schedule of the Two Sample Classes

Material	Plan (Phase I)	Do-See (Phase II)	Plan (Phase III)	Do-See (Phase IV)
Cell structure, advantages & disadvantages of learning Cell Biology, tools & technique of learning cell	18 <sup>th</sup> March 2013	22 <sup>nd</sup> March 2013 (Class A)	22 <sup>nd</sup> March 2013 (Class B)	24 <sup>th</sup> March 2013 (Class B)
Function of organic and inorganic chemical component.	29 <sup>th</sup> March 2013	1 <sup>st</sup> April 2013 (Class B)	1 <sup>st</sup> April 2013 (Class A)	3 <sup>rd</sup> April 2013 (Class A)
Structure of cell membrane & the permeability	1 <sup>st</sup> April 2013	8 <sup>th</sup> April 2013 (Class B)	8 <sup>th</sup> April 2013 (Class A)	10 <sup>th</sup> April 2013 (Class A)
Endomembrane System; Supporting Organelle	11 <sup>th</sup> April 2013	15 <sup>th</sup> April 2013 (Class B)	15 <sup>th</sup> April 2013 (Class A)	17 <sup>th</sup> April 2013 (Class A)
Structure & function of Cytoskeleton	18 <sup>th</sup> April 2013	26 <sup>th</sup> April 2013 (Class A)	26 <sup>th</sup> April 2013 (Class B)	27 <sup>th</sup> April 2013 (Class B)
The structure and the function of mitochondria and chloroplast	29 <sup>th</sup> April 2013	2 <sup>nd</sup> May 2013 (Class A)	2 <sup>nd</sup> May 2013 (Class B)	4 <sup>th</sup> May 2013 (Class B)
The nucleus and genetic material	6 <sup>th</sup> May 2013	9 <sup>th</sup> May 2013 (Class A)	9 <sup>th</sup> May 2013 (Class B)	11 <sup>th</sup> May 2013 (Class B)

## 4 DATA AND DATA ANALYSIS

The lecturers' professionalism data were obtained from the questionnaires delivered to the lesson study team members consisting of six lecturers and eleven senior students. The data were also obtained from the structured interviews to know the lecturers' opinion towards the development and the implementation of e-portfolio in learning. The questionnaires which were delivered consisted of the planning and the form of e-portfolio as well as the advantages of e-portfolio implementation. The questionnaires were delivered after the implementation of e-portfolio during the lesson study activities. While in order to examine the process of the lesson study, an observation sheet and field note were utilized.

The results of the questionnaires data analysis related to the development and the implementation of e-portfolio were categorized as be able to support the lecturers' professionalism if the results reached the minimum point 70%. The data obtained from the observation sheet and the field note were analysed by using data reduction and the conclusion was derived descriptive qualitatively.

## 5 FINDINGS

The development and the implementation of e-portfolio were conducted in Cell Biology learning through the lesson study activities. During the realization of the lesson study, 6 lecturers and 11 senior students were involved as the respondents. All of the respondents stated that the lesson study activities are able to improve the lecturers' professionalism in terms of planning, implementation, and learning evaluation.

Based on the analysis of the questionnaires, the video recording, the observation sheet, and the reflection activity during the lesson study, most of the team members experienced how to plan and carry out learning in a good structure. The reflection result showed that the lecturers' professionalism improved in the following aspects.

### 5.1. Planning Learning Activities including E-portfolio Assignment Planning

The planning of the assignment being uploaded by the students in form of e-portfolio was arranged based on the lesson plan in *plan* stage by the lesson study team. Table 2 presents the planning and assignment in form of the developed e-portfolio.

Table 2. The Percentage of the Assignment Planning in form of E-portfolio

Feedback based on the questionnaires	Percentage	Criteria
The planning of assignments being uploaded in form of e-portfolio consisting of Cell Biology materials	80.9	Very endorsing
The types of the assignment used as e-portfolio materials is interesting to be discussed	83.8	Very endorsing

The reflection result showed that the team members feel an improvement in terms of the lesson plan arrangement related to the assignment type as the e-portfolio component. The lecturers feel an improvement in terms of observing and revising the lesson plan with several assignments as the e-portfolio component.

### 5.2. Implementing IT Skill during Learning Activities

The developed and implemented e-portfolio improved the lecturers' ability in implementing IT in order to support the learning. It is reflected on the following Table 3.

Table 3. The Percentage of IT Utilization Skill in Learning

Feedback based on questionnaires	Percentage	Criteria
IT utilization in learning activity through e-portfolio is a technology integration need to be learnt.	95.6	Very endorsing
Uploading the complete assignments in form of e-portfolio is easy	91.2	Very endorsing
The lecturers and the students are able to learn IT besides the main materials	97.1	Very endorsing
The lecturers possess a skill in utilizing IT especially in arranging the e-portfolio	94.1	Very endorsing

A team member reported a condition in detail that it is necessary to improve the students' ability in learning a particular material, yet it is better if the lecturers are able to operate the IT facility first to support the learning activities. This statement was recorded on See on 10<sup>th</sup> April 2013 by Linda:

*'As a junior lecturer, I think we need to enhance our skill as a consequences in improving the lecturers' professionalism. One thing that I think it is necessary to improve is the integration of IT and the existence of e-portfolio is very relevant to fulfil our need. This is not only good for the students to improve themselves but also to motivate lecturers to always implement it in every learning activity.'*

*In this case, the lecturers will learn how to use IT and develop their own capability indirectly.'* (Taken from the reflection note on 15<sup>th</sup> April 2013).

The above statement indicated that the lecturer himself feel the advantage of the implementation of e-portfolio, especially in improving the IT skill. Linda informed the importance of e-portfolio for lecturers in assisting them to contribute skill, organize, deliver materials, give advice, discuss, and communicate regardless time and place.

### 5.3. Evaluating the Students' Works

The lesson study team members showed a positive behaviour by stating to the students that e-portfolio is an alternative way to evaluate the students. The lecturers stated that e-portfolio is not only used to examine the students' ability based on the uploaded assignments but also to help the students to study and recognize their own personal ability.

Table 3 The Percentage of E-portfolio Implementation to Support the Evaluation Process

Feedback based on questionnaires	Percentage	Criteria
The existence of e-portfolio ease the lecturers to score the students	86.8	Very endorsing
The existence of e-portfolio facilitates the lecturers as an evaluation instrument towards the students' ability.	92.6	Very endorsing

During the implementation of e-portfolio, the lecturers were more critical in observing the students' work. It is assumed from the field note of a member of the lesson study as follow:

*'I think I can see the students' work better after observing their works on e-portfolio. At the beginning I felt confused especially in terms of the important component structure and the important component placing of e-portfolio, yet that condition were fixed at once. Therefore, I think the implementation of e-portfolio is an effective way to evaluate the students' learning result.'*

(Taken from the reflection note on 3<sup>rd</sup> April 2013).

### 5.4. Creating a Good Communication between Lecturers and Students

One of e-portfolio facility is discussion forum which can be carried out between lecturer and student or among students. It is reflected on the statement:

*‘The communication process happen in e-portfolio facility makes the comprehension towards Cell Biology materials more detail. The students can upload their statements and some supporting data or relevant link related to the materials being discussed.’*

(Taken from the reflection note on 27<sup>th</sup> April 2013).

### 5.5. Identifying the Students’ Problems

The observation activity during the learning process showed that the observer was able to examine the difficulty experienced by the students both in utilizing e-portfolio and in comprehending the material. It is reflected on the following recording:

*‘The continuous observation enables me to observe the students’ problem meticulously. From the observation I can see that most of the students can hardly comprehend the materials, they tend to re-open the files on the e-portfolio. It seems that it helps them to re-learn their notes during the lecturing.’*

(Taken from the reflection note on 4<sup>th</sup> May 2013).

The e-portfolio facility basically eases the students to re-correct their works and compare the works to others’. This helps the students learning process indirectly; it was proven by the result of the questionnaire on Table 4.

Table 4. The Percentage of E-portfolio Implementation to Encourage the Students’ Learning Process

Feedback based on questionnaires	Persentase	Criteria
E-portfolio eases the students to compare their works one another	83.8	Very endorsing

### 5.6. Improving the Self Confidence

The developed and the implemented e-portfolio through the lesson study activities can improve the lecturers’ confident in teaching. It was felt by the model lecturer who play an important role during the lecturing process. Even though the other team members in Cell Biology subject did not perform as the model lecturers, they also confirmed that the implementation of e-portfolio supported by the

lesson planning helps the lecturers’ work. One of team members, Waskito, stated that:

*‘I can feel that the revised stages of the implementation of e-portfolio based on the previous suggestions optimized the e-portfolio for the students. The assignment deadline encourages the students to make a plan to finish their assignments every week. The e-portfolio is an appropriate instrument to give an instruction or guidance to the students so it creates a conducive learning atmosphere. Therefore, the lecturers might be more confident in teaching since they are supported by a proper planning and a proper instrument.’*

(Taken from the reflective note on 10<sup>th</sup> April 2013).

### 5.7. Improving the Students’ Learning Result

One of the lecturers’ improving professionalism indicators in learning by implementing e-portfolio was the students’ learning results. In the present study, the learning data based on the students’ quiz score on each meeting on each cycle during the lesson study were taken. The quiz average score of the students is presented on the following Figure 2.

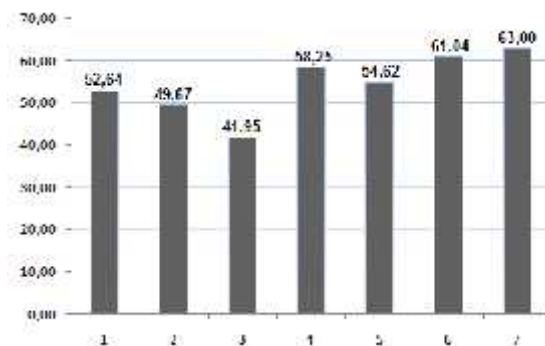


Figure 2. The Histogram of the Quiz Average Score from the First Meeting to the Seventh Meeting

The above Figure 2 revealed that the quiz score average on each lesson study cycles increased even though the average score decreased on the third meeting. The increasing quiz average score from the first meeting to the seventh meeting was 16.44%.

### 5.8. The Developed E-portfolio Profile

The results of the development of e-portfolio during the lesson study activities are presented on the following Table 5.

Table 5. The Development of E-portfolio Features during the Lesson Study

Features	Description
User Page	The students register and get the lecturing materials as well as the information needed during the lecturing activity.
Profile	A place for the students portfolio and is completed by the students' identity and photograph.
Friends	Connect the users to other friends to do the assignments and share some information.
Private Portfolio	The uploaded assignments can be in form of file, photograph, or video.
Assignment Uploading Deadline	The deadline when the students have to upload their assignments. The deadline is a week after the lecturing activity started, after that the uploading session is closed.

## 6 DISCUSSION

The findings of the study showed that the lesson study was an important effort and process that supported the development and the implementation of e-portfolio in Cell Biology learning, especially in improving the lecturers' professionalism. The instrument was developed in the beginning of the study and improved during the implementation of the lesson study made the lecturers were able to discuss and observe its implementation. The lesson study team discussion process is a collaborative characteristic as an effort to improve the learning quality (White and Southwell, 2010). Furthermore, Garret, *et al.* (2001) stated that the development of the educators' comprehension is significantly enhanced through several activities and experiences to improve their professionalism, one of which is through the development and the implementation of e-portfolio.

The application of the lesson study for fourteen meetings in two Cell Biology classes showed an increasing ability of the lecturers in planning the learning activities, conducting the learning, and evaluating the learning by using e-portfolio. The lecturers' professionalism improvement was in line with the learning performance in class. Verhoef&Tall's (2011) study verify that the professionalism development was supported by the practical activities in class and discussion with the lesson study team.

The completing e-portfolio instrument was done together with the completing of learning materials

and the media, and the evaluation process was done after *do* stage or the continuous implementation. Therefore, the lesson study team members could learn how to adjust the learning materials and the supporting instruments as well as the evaluation process. It is in line with Wood's (2013) statement that the arrangement of the learning materials based on the learning situation might become a systematic experience for the lecturers, in terms of (1) understanding the materials object, (2) developing the materials object, and (3) implementing various techniques to arrange the next learning.

The development of the lecturers' competence to improve their professionalism is an important point in this study. All of the lesson study team member agreed that e-portfolio was an important part to develop their capability and self-potential as a lecturer. The advantage of the pair discussion, sharing, and giving feedback from the students' learning result session in form of e-portfolio made the lecturers more focus and confident in teaching. Rock & Wilson (2005) confirmed that the lesson study activity might increase professionalism which can be carried out independently by any universities. Besides, it saves more money compared to send the lecturers to improve their professionalism to other universities. In this case, there will be more fund saved that can be allocated for other activities.

This study also showed that the IT integration was an important thing needed to increase skill. Besides as an evaluation instrument, e-portfolio could also be used by the lecturers and the students to enhance their skills in utilizing IT, in which has been improving for the last 10 years in education world. Umar and Yusoff (2014) showed that the IT skill is positively correlate to the utilization frequency. Hence, the more the lecturer implement e-portfolio, the more they get the improvement in terms of IT utilization as the learning instrument.

The lecturers' professionalism due to the IT utilization through the lesson study activities could be seen from the planning side and the focus of the learning. Whenever the e-portfolio was implemented, the lecturers could observe the students' uploaded assignments in form of digital format, such as powerpoint, pdf, video, or photograph which could easily be used. Klement, *et al.* (2014) confirm that the IT support needs to be designed as easy to use as possible. This might make the lecturers know the strengths and weaknesses of the students in learning as well as the lecturers' awareness in observing the students' works.

The opinion stated by one of the lesson team members who actively participated in the

development and the implementation of e-portfolio showed an interest and willingness to utilize the same instrument in his/her learning. It is because the existence of e-portfolio helps to integrate IT so it can improve his/ her capability. It revealed that the lecturer was aware to the importance of IT support in the learning process, which also became an indicator that the lecturer had a willingness to improve his/her own capability through e-portfolio implementation. The experience of implementing e-portfolio as an evaluation strategy to support learning is known as an activity that can be implemented to improve the learning quality.

The IT has become a required instruments to be used to support the learning process in order to assist lecturers to deliver materials and evaluate, such as e-portfolio. The evaluation process, by using e-portfolio for instance, is an important point in learning because lecturers can be more focus on observing the students' ability through their uploaded works. As Taylor, *et al.*, (2005) stated that it is important to find a solution towards the learning problem nowadays. This is an important thing need to be considered since it eases the lecturers to evaluate the students' works during the Cell Biology learning.

The assignment planning process which needs to be uploaded to e-portfolio based on the Cell Biology curriculum involved the lesson study team. Practically, it might help the lecturers to enhance the lecturers' professionalism for it encouraged the team members to work in learning community in which (Taylor, *et al.*, 2005; Marsigit, 2007; and Rock and Wilson, 2005) state that it supports the learning activity in class in terms of the planning and the evaluation.

The learning result was the learning quality process improvement indicator which could be assumed from the students' improving average scores during the seven meetings. It revealed that the learning plan through various assignments which had been discussed beforehand in the plan stage and was uploaded in form of e-portfolio was able to develop the student thinking ability. The learning plan made through some discussion by the lesson study team members eased the process of the Cell Biology learning. The team collaboration in planning activity became the important aspect in the successfulness of the learning, as it revealed in Inprahista's (2014) study.

The plan and do support in the lesson study activities helped to improve the lecturers' professionalism in several aspects, namely (a) comprehend the Cell Biology materials subject more

detail due to the discussion among the lesson study team, (b) develop the capability in planning lesson, conduct and report the observation activity, (c) be focus on the students' difficulties related to the uploaded assignments in e-portfolio, and (d) observe the activities during the learning process to be adapted and implemented later.

## 7 CONCLUSIONS

The development and the implementation of e-portfolio through the lesson study activities were able to improve the lecturers' professionalism in Teacher Training Institute of PGRI MADIUN. The assignment planning process in form of e-portfolio which was based on Cell Biology curriculum helped to develop the lecturers' overall ability in planning a learning activity, carrying out and observing condition through observation, and reporting the result of the learning. In the end, the lecturers might feel the impact of the implementation of e-portfolio as an optimum teaching instrument to support the learning activity.

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## The use of Lesson Study as Professional Development for Differentiating Mathematics Instruction in Indonesian Primary Schools

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**Abstract:** Teachers are encouraged to be life-long learners and to engage in professional learning through professional development programmes. There has been concern about the effectiveness of short term single professional development experiences, so called 'hit and run' activities. Successful professional learning needs to be long-term and reflective and Lesson Study is one such professional development strategy. Lesson Study provides ongoing, long-term learning and reflection for teachers using a teaching/learning cycle model of planning, teaching, evaluating, and reflecting by a group of teachers working collaboratively in one school or across a district. This paper describes how Lesson Study can be used to provide professional development to encourage teachers to adopt differentiated learning in their primary school mathematics lessons. It is envisaged that Lesson Study will assist teachers to meet their students' needs in learning mathematics by taking into account their diversity. A qualitative case study was employed in this research through an interpretive paradigm. Data was collected through semi-structured observations, document analysis, and video recording. The videos were analysed by using Multimodal Analysis Video (MMAV) software. This presentation outlines the professional development programme undertaken in Flores, Indonesia in 2014 and the preliminary findings.

**Keywords:** Lesson Study; differentiated mathematics instruction

### 1 INTRODUCTION

Mathematics is one of the core subjects in the Indonesian curriculum and is studied by every student. Many students, however, do not have an interest in learning mathematics. This may be caused by a number of reasons including the teachers' lack of qualifications, the teachers' lack of knowledge or their methods of teaching mathematics (Surya, 2010). One of the effective ways of improving student engagement may be for teachers to differentiate mathematics instruction so that it can meet the needs of all learners in regular classrooms and improve the ability of students (Tomlinson & Eidson, 2003).

Surya (2010) argued that the problem was not the students' capacity to learn but the quality of their teaching and instruction. He also recommended ongoing professional development to improve teachers' content and pedagogical knowledge and skills. The ongoing professional development for teachers is important and this can be done as part of the regular classroom routine (Jalal et al., 2009).

It is common for professional development in Indonesia to be delivered in a top-down style (Hadi,

2012). Teachers come to a workshop and learn new strategies or knowledge from instructor(s), then return to their schools. However, there are limits to how far this method of professional development can be taken. There is no consideration as to whether teachers apply the new knowledge and there is no evaluation about the effectiveness of the professional development on teachers' content and pedagogical knowledge and skills. Therefore, more effective forms of professional development are needed and the effects need to be measured and evaluated.

Hadi (2012) claims that it is difficult to introduce a different kind of professional development such as Lesson Study because teachers have established their own teaching style. This applies to almost every teacher, including mathematics teachers. On the other hand, with a great effort and willingness to change the quality of mathematics education in Indonesia, Lesson Study could be an effective way to improve teachers' knowledge, skills, understanding and values in differentiated mathematics instruction. Through Lesson Study, teachers can share their knowledge and



understanding and they can also provide constructive support to their colleagues.

So far, however, there has been little discussion about the use of Lesson Study to improve mathematics instruction in Indonesia. Therefore, this paper focuses on how Lesson Study can be used to provide professional development to encourage teachers to adopt differentiated learning in their primary school mathematics lessons. A brief overview of differentiated mathematics instruction and Lesson Study is provided, followed by a description of the research method he preliminary results of the study.

## 2 DIFFERENTIATED MATHEMATICS INSTRUCTION

As previously indicated, students in regular classrooms have diverse backgrounds and abilities. Differentiation in teaching can cater for that diversity in a heterogeneous classroom. Differentiated teaching is different from traditional teaching, and does not necessarily involve direct instruction. It uses similar content, but utilises diverse levels of cognitive thinking for different groups (Bender, 2009). Teachers adjust the activities to cater for particular students' readiness, interests, and learning styles and teachers subsequently can provide effective teaching which can both cater for their current students' interest and help students to realise their hidden interests (Tomlinson, 2003).

Teachers can start from the standard curriculum expectations and school facilities, but modifications can be made to the curriculum, the processes of teaching, the activities provided during the lesson time and the products of learning, with the main objective being to maximise student learning (Tomlinson, 1999). The way to assess students and the learning environment needs to also be modified to meet students' needs (Tomlinson, 2003). Differentiation in one topic may be different to that in another topic because the interest and ability of students varies depending on the learning area (D'Amico & Gallaway, 2008). This requires teachers to respond carefully to their students' needs. The students' progress and responses to lessons forms the basis for modifying future lesson plans. Therefore, a focus on how to design and implement differentiated instruction of work needs to be a central focus of any professional development such as Lesson Study. These forms of differentiation are summarised in Figure 1.

Figure 1. Differentiated Instruction Model (adapted from Tomlinson, 2003)



### 2.1 Content Differentiation

According to the students' various levels of ability, interest and readiness, teachers can modify the content by providing a range of materials from simple to more complex (Tomlinson, 1999). For example, in teaching multiplication, teachers can provide one, two or three digit multiplication based on students' readiness. Tomlinson (1999) also suggests that the content that is being taught needs to connect with students' daily life and present actual problems, not only doing repetitive exercises in the lesson.

### 2.2 Process Differentiation

The teaching and learning process is dynamic. With flexible grouping students are allowed to work alone or in a group (Strickland, 2007; Tomlinson, 1999, 2003; Tomlinson, Brimijoin, & Narvaez, 2008). They can work in pairs or with other students who have similar or different abilities and interests. Students who may not be confident to speak in a big group will get the opportunity to share their understanding in a small group or just with a single partner. Teachers can manage discussion for a whole class at the beginning or at the end of the lesson and then, students summarise the topic that they learnt on that day.

Students' learning profiles are influenced by their "learning style, intelligence preference, culture, and gender" (Tomlinson, 2003, p. 3). D'Amico and Gallaway (2008) describes three kinds of learning styles: (i) visual learners who prefer learning by seeing and tend to prefer to use, for example, videos, slides, pictures, charts, maps, and diagrams; (ii) auditory learners who are able to learn most effectively by listening, for example, to tapes, tutors, radio, and other people; and (iii) tactile or kinaesthetic learners who can improve their

understanding by doing experiments, touching, and moving. Based on these types of learning, teachers can deliver the material in different ways such as using videos or radio or doing experiments to accommodate these needs.

### 2.3 Product Differentiation

To address students' different levels of ability, tasks can be arranged in various levels of difficulty (Tomlinson, 2003). Appropriate level of task complexity can accommodate students' different degrees of knowledge (Tomlinson, 1999). This can also ensure students are being challenged (Strickland, 2007). Tasks are provided in order to meet students' readiness, interest, learning profiles, and affect (Tomlinson, 2003). Information about students' readiness can be gleaned from their previous reports, or if it is needed, teachers can conduct pre-tests. Also, students have freedom as to how to express their learning (Tomlinson, 1999). For example, students can explain their understanding orally, by writing or using visual representations such as charts. Flexibility in submitting the task is considered because students have different abilities and strategies for accomplishing tasks (Heacox, 2002; Tomlinson, 1999).

### 2.4 Assessment Differentiation

Different to the conventional teaching which usually assesses students at the end of a unit or topic or at the end of a certain time period (summative assessment), in a differentiated classroom students' progress is assessed periodically during the learning process (formative assessment) (Strickland, 2007; Tomlinson, 1999). Diagnostic assessment affords everyday information about students' readiness, interests, and learning profiles (Tomlinson, 1999). Students' products can also be assessed by both the students themselves and the teachers (D'Amico & Gallaway, 2008). Self-assessment can build students' self-confidence. Teachers can also make observations during the lesson time to assess their students' progress. The results of the formative assessment methods are then used to modify the following lesson.

### 2.5 Learning Environment Differentiation

The classroom environment also plays an important role in differentiation. This includes the circumstances of the classroom physically such as the arrangement of resources and mentally, such as

class roles (Tomlinson, 2003). A comfortable environment will motivate students in their learning.

Even though differentiating instruction needs much effort, this could develop students' capability that will affect to their self-confidence and this will boost their motivation to study more. It is not essential to differentiate all the aspects above in every lesson. Differentiation can be made maybe in two aspects e.g. content and process, or three aspects. Flexibility depends on teachers' readiness and the needs of the lesson and the learners. Every student will feel valuable as there is no word for 'fail' during the learning process.

## 3 LESSON STUDY

Lesson Study has become popular in a number of countries in recent years, for example in the United States where it has been used since the late of 1990s (Murata, 2011). Lesson Study in Indonesia was introduced in 2005 (Suratno & Iskandar, 2010). A case study of cooperative Lesson Study between Indonesian mathematics and science teachers and university faculty academic staff concluded that there were improvements in teachers' knowledge of content and organisation of the lessons and the students' response throughout the lessons (Saito, Harun, Kuboki, & Tachibana, 2006). Fernandez (2005) points out that Lesson Study can develop not only teachers' mathematical content knowledge, but also their research experience. Although it was determined that even though, teachers found difficulty in allocating the time, this professional learning developed participants' "teaching performance, variation of teaching methods/approaches, and collaboration" (Marsigit, 2007, p. 143).

Lesson Study is one of professional development types which is continuous and emphasises collaboration between teachers within a group (Lewis, 2002). The group of teachers meet regularly to create the lesson plan and review the teaching in order to further develop the lesson plan and teaching (Hunter & Back, 2011). Lesson Study begins by planning the lesson plan together, then one of the member teach while other members observe. After the lesson they meet to review the teaching process and then create the next lesson plan collaboratively. The process of Lesson Study is displayed in the Figure 2.

The professional development commences by organising the Lesson Study group and setting the goals for the groups. Taylor, et al. (2005) identified that their Lesson Study group's goal was "to give

students the opportunity to share their math thinking with their classmates” (p. 19). Then, the group starts the Lesson Study cycle by determining the lesson topic to be taught. After deciding which topic will be taught, the goals of the lesson can be generated from a general goal to the more specific goals (Murata, 2011). Example of general goal of the lesson is that students know prime numbers, and the specific goal may then be students are able to mention prime numbers between 20 and 30.

Figure 2. Lesson Study cycle for differentiated mathematics teaching



Then, from the goals, teachers collaborate together to create a lesson plan. Murata (2001) underlined that the key purpose is not to design a perfect lesson but to investigate students’ ways of learning when teachers use certain teaching strategies. Moreover, Murata (2001) said that this step is the opportunity for teachers to develop their own knowledge of the content. In Lesson Study, teachers apply ongoing assessment that is consistent with the learning process in differentiated mathematics instruction. This assessment then is being used to inform the next lesson plan (Bruce & Ladky, 2011; Tomlinson, 2001).

After the lesson planning is finished, one teacher from the group will teach a class while the other members of the group observe the lesson (Murata, 2011). The observer(s) fill in an observation checklist/form (see Appendix 1) and/or make anecdotal notes. This data is then being discussed with the rest of the Lesson Study group members (Murata, 2011). From this discussion, they decide whether they need to revise or re-teach the content (Murata, 2011).

Lesson Study is time consuming but this ongoing professional learning empowers teachers and improves their professional development progressively (Taylor, Anderson, Meyer, Wagner, & West, 2005). When the Lesson Study group members come from different schools, it is possible that they need to travel and need additional time for

meeting and discussion. This can be overcome, however, by gathering the Lesson Study group from teachers within a school. Murata (2011) suggests that an in-school Lesson Study group is effective because teachers can share information about the students and the particular community.

## 4 RESEARCH MODEL

### 4.1 Research Design

This study began with professional learning to introduce differentiated mathematics instruction and Lesson Study ideas to the teachers. This involved four teachers from SDI (Sekolah Dasar Instruksi Presiden) Madambake (Madambake President Instructional Primary School), Nangaroro district, Flores Island, Indonesia. After the Lesson Study session ended, it was followed by with the first Lesson Study group meeting. They are four teachers who are class teachers for Year Three, Four and Six, and the principal. In this meeting, the teachers decided who would teach and the rest of the members acted as observers. Then, they created the first lesson plan on the topic of angles with focus on differentiated mathematics instruction. After one teacher taught for the first lesson, they met to review the teaching process and this was followed by the creation of the second lesson plan for the second mathematics lesson. After the second lesson, they had the third Lesson Study group meeting for reviewing the second lesson.

### 4.2 Case Study: Differentiating Mathematics Instruction for Mathematics Lessons through Lesson Study Groups Meetings

A qualitative case study was employed in this study with a goal of collecting enough data about the Lesson Study group to provide professional development to encourage teachers to apply differentiated learning in their primary school mathematics lessons. Specifically, this case study focused on what the teachers talked about while planning and teaching mathematics using differentiated mathematics instruction. The case study approach is appropriate for studying a program or an activity such as this (Creswell, 2013).

### 4.3 Data Analysis

Data for this study included observation reports, written lesson plans and video recording of two mathematics lessons and three Lesson Study group meetings. The various types of data collected were analysed through three steps: (i) “categorization”, (ii) “description”, and (iii) “synthesis” (Wiersma and Jurs, 2005, p. 207).

The videos were analysed by using Multimodal Analysis Video (MMAV) software which contains facilities for importing videos files, entering analytical frameworks and creating time-stamped annotations and visualisations. Multimodal analysis is the study of how language, images and other resources combine to create meaning in texts, interactions and events (O’Halloran, E., & Tan, 2014). The video which was imported and analysed using MMAV software was transcribed using facilities in the software. The analysis of video focused on the teacher’s activities which were categorised based on the elements of differentiated instruction; namely content, process, product, assessment, and learning environment.

Figure 3. The Multimodal Analysis Video



- |                        |                      |
|------------------------|----------------------|
| 1. The film            | 4. Indicators or     |
| 2. The transcription   | description of each  |
| 3. Themes that will be | the theme            |
| analysed from the      | 5. The theme that is |
| video                  | chosen               |
|                        | 6. The film, sound,  |
|                        | dialog, and theme    |
|                        | strips               |

Figure 4. Visualization of video analysis results

A screenshot of MMAV is displayed in Figure 3. The various components of the graphical user interface (GUI) are (1) the player with volume, time and speed controls; (2) the transcription; (3) the themes that will be analysed from the video (this is created from the library GUI which is accessed through the library icon on the left); (4) indicators or descriptions of each theme (this assists the researcher when categorising the themes); (5) the

theme that is chosen for the annotation node; (6) the film, sound, dialog and themes strips. The videos were transcribed and the various forms of differentiated mathematics instruction which the teacher employed were coded using time-stamped annotation nodes transcribed the dialogs during the lesson.

The left panel in Figure 4 displays the relative percentage of time for each form of differentiated mathematics instruction. That is, the circles (i.e. the “states”) with the percentages represent the percentage of time for each form of differentiated instruction: i.e. content, process, product, assessment, and learning environment. The lines connecting the circles indicate the transition between each of these states.

## 5 RESEARCH FINDINGS AND DISCUSSION

The teachers who participated in Lesson Study worked together to prepare the lesson and anticipate the problems may arise. Also, they were able to also discuss the implementation of the 2013 curriculum 2013 that they started to apply in this academic year, 2014/2015.

### 5.1 Lesson Study group meeting 1

After the teachers learnt about differentiated mathematics instruction and Lesson Study in a professional development, they formed a Lesson Study group which was involved in this study. The four teachers met to discuss and prepare the first lesson plan with angle (right, acute, and obtuse angles) as a topic. They used the lesson plan format that is provided by school, but they modified and paid more attention to differentiation in the lesson. That is, the teachers tried to differentiate content, process, assessment and learning environment while they also became familiar with the new curriculum and textbook for 2013. However, they didn’t differentiate the product in the lesson. They still prepared the task with the same level of difficulties. However, as Tomlinson (1999) claims, it is difficult to differentiate everything in one lesson.

They chose topic based on the curriculum and then planned the lesson based on the teacher’s experience with some modifications on the content, process, assessment and learning environment. For the content differentiation, one teacher suggested using objects in the classroom to see the angles



created by each object. This is relevant to students' daily lives which are the objects close to them. To differentiate the process, the Lesson Study group decided to group students in the classroom. They tend to use heterogeneous grouping, given the various abilities of the students. In assessing students, the Lesson Study group decided to use a rubric for the ongoing assessment. However, the indicators in the rubric are concerned with student activeness during the lesson. These are listening, non-verbal communication, participation, and fluently of speaking.

### 5.2 Mathematics Lesson in SDI Madambake

The results of used differentiated mathematics instruction obtained from the preliminary video analysis of mathematics lesson about angles are shown in Table 1.

Table 1. The Used of Differentiated Mathematics Instruction in SDI Madambake

	Differentiated Mathematics Instruction shown	Example of evidence(s)	Time used during the lesson (in %)
1	Content of differentiation	Teacher associated the topic to students' environment by asking them to show the objects in the classroom that has angles.	1.70
2	Process of differentiation	Teacher gave open ended questions that encourage students to think creatively.	17.48
3	Product of differentiation	Teacher gave more time to the group that need.	0.26
4	Assessment of differentiation	From the lesson plan, it can be seen that teacher provide rubric for	-

		the lessons.	
5	Learning environment of differentiation	Teacher encouraged students to appreciate their friends who answered the question rightly by giving applause. Teacher appreciate student who did their job properly.	9.06
		Total	28.50

The teacher applied the principle of differentiation for 28.5% of the lesson time. Mostly, the teacher differentiated the process (17.48%), for example, the teacher tried to encourage students to think critically. Examples of this type were shown when the teacher required one student to point the angles of the board in the classroom before the teacher explained the meaning of angle, then the teacher asked: "Who can define...what the meaning of angle is?" The question was posed after the teacher asked students to point some objects in the classroom and showed the angle of the objects.

The learning environment differentiation (9.06%) was evidenced by the teachers' appreciation of appropriate responses to questions. She did not only say "good" to the student, but also sometimes asked the whole class to clap their hands in appreciation. In this way, the teacher encouraged students to respect their friends.

In the content of differentiation (1.70%), the teacher taught at the same level of difficulty to all students, but the teacher sought to establish the relations between the topic and the students' daily lives. She asked students to show objects in the classroom that has angles. Then, she asked some students to point the angles of the objects.

From the product of differentiation (0.26%), the teacher didn't offer various levels of task difficulties and gave only one kind of task. However, she gave opportunity to one group for completing the task.

Differentiation of assessment can be seen from the lesson plan. The group provide rubric to assess the students' activeness during the lesson. In this lesson, assessment of students' understanding about the topic was undertaken through group discussion. The teacher allocated marks based on the number of questions which the students answered correctly.

## 6 CONCLUSION

This paper proposes a model of Lesson Study features as a professional development to foster teachers' use of differentiation in mathematics lessons. The professional development session involving Lesson Study assists teachers to prepare their teaching. In this study, the data indicates that teachers used Lesson Study to assist them to differentiate content, process, product, assessment and learning environment. Even though, the differentiation was undertaken in less than one third of the total class time and across a limited number of indicators, it was evident that the teachers had valued the diversity of their students, which had a subsequent impact on their teaching. As Lewis, Perry and Hurd (2009) claim, teaching can be modified step by step.

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**APPENDIX 1**

**TEACHING AND LEARNING PROCESS MATHEMATICS  
DIFFERENTIATED INSTRUCTION IN LESSON STUDY OBSERVATION  
FORM**

Date of observation lesson	: .....	Teacher	: .....
Class	: .....	Observer	: .....
Start time	: .....	Finish time	: .....
Topic	: .....		
Goals of the lesson	: ..... : ..... : ..... : .....		
Classroom arrangement (desks and chairs setting)	: ..... : ..... : .....		
<b>Time</b>	<b>Teacher</b>	<b>Students</b>	<b>Other Notes</b>
Resources used	: .....		
IT used	: .....		
Teaching aids used	: .....		

Observer,

.....

# Materi Bangun Datar Dan Bangun Ruang Dengan Menggunakan Alat Peraga Untuk Meningkatkan Kreativitas Mahasiswa Semester I Tahun Akademik 2013/2014

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**Abstract:** Dari hasil Lesson Study dapat disimpulkan bahwa: (1) kondisi pembelajaran Pendidikan matematika I yang dijadikan lokasi penelitian secara umum sudah berjalan baik, sebagaimana dapat dilihat dari: pemahaman mahasiswa terhadap tujuan pembelajaran matematika terkait bangun datar dan bangun ruang, metode yang digunakan dosen model cukup bervariasi, meskipun materi pembelajaran matematika yang dikembangkan masih terlalu banyak, sumber yang digunakan masih menggunakan buku paket, peran mahasiswa dalam kegiatan pembelajaran cenderung masih kurang optimal, (2) pembelajaran bangun datar dan bangun ruang dengan alat peraga dilaksanakan melalui tahap perencanaan, pelaksanaan dan refleksi. (3) faktor-faktor yang mendukung pelaksanaan model pembelajaran dengan alat peraga adalah adanya alat-alat penunjang yang sudah di sediakan dosen, sehingga mempermudah pelaksanaan pembelajaran matematika, sedangkan faktor yang menghambat pelaksanaan alat peraga ini adalah budaya mengajar dengan menggunakan metode ceramah; (4). pembelajaran dengan menggunakan alat peraga ternyata lebih efektif. Begitu juga jika dibandingkan antara pembelajaran alat peraga dengan pembelajaran tidak menggunakan alat peraga, ternyata terlihat lebih antusias dalam kegiatan pembelajaran dengan menggunakan alat peraga.

**Keywords:** Bangun datar, bangun ruang, alat peraga

## 1 PENDAHULUAN

Matematika merupakan ilmu yang universal yang mempunyai peran sangat penting dalam berbagai disiplin ilmu dan memajukan daya pikir manusia (BSNP, 2006:139). Menurut Albert Einstein matematika adalah yang sebenarnya menawarkan kepada pengetahuan-pengetahuan alam suatu pengukuran pasti dimana tanpa matematika, kesemuanya itu tidaklah mungkin untuk diperoleh (Wahyudin, 2008a:8). Hal tersebut mengisyaratkan betapa pentingnya pendidikan matematika untuk dipelajari oleh semua orang khususnya mahasiswa.

Sedangkan pada kenyataannya banyak peserta didik yang belum mampu melakukannya, misalkan pada materi bangun datar dan bangun ruang yang merupakan salah satu materi yang harus dipelajari di perguruan tinggi khususnya PGSD.

Materi bangun datar dan bangun ruang sangat penting untuk dipelajari oleh perguruan tinggi untuk dipergunakan dalam kehidupan sehari-hari. Banyak sekali benda dalam alam nyata yang merupakan

bentuk bangun datar dan bangun ruang, sehingga pemahaman konsep yang benar tentang bangun datar dan bangun ruang ini sangat diperlukan oleh mahasiswa. Namun, pada kenyataannya, mahasiswa PGSD UMMU dari tahun ke tahun jumlah mahasiswa yang mencapai nilai KKM yang ditetapkan untuk pokok bahasan bangun datar dan bangun ruang sisi datar yaitu 65 masih di bawah 50%. Kemudian ketika dilakukan tes awal kepada mahasiswa semester I kelas A dan B ketika akan melakukan pembelajaran bangun datar dan bangun ruang, jumlah mahasiswa yang dapat mencapai nilai KKM di bawah 40%. Kenyataan ini sangat jauh dari yang diharapkan tentunya.

Menurut analisa penulis, hal tersebut diakibatkan materi bangun datar dan bangun ruang dalam kurikulum perguruan tinggi diletakkan secara terpisah antara bangun ruang dan bangun ruang sisi datar, yaitu bangun ruang sisi datar di semester I. Mahasiswa menganggap bahwa antara bangun datar dan bangun ruang sisi datar dan bangun ruang sisi lengkung tidak ada kaitannya. Hal ini terlihat ketika



mahasiswa diberikan materi bangun datar dan bangun ruang, pada umumnya mahasiswa merasa hal baru lagi termasuk rumus-rumus yang sama pada bangun datar dan bangun ruang. Ketika bertemu materi yang sama di matematika lanjutan tidak kebingungan ketika ditanya tentang materi tersebut. Hal ini menunjukkan kemampuan koneksi mahasiswa yang masih rendah sehingga konsep bangun datar dan bangun ruang kurang dipahami dengan baik.

Berdasarkan paparan di atas, dipandang perlu adanya pembaharuan strategi pembelajaran matematika pada situasi dan kondisi mahasiswa yang terjadi pada saat ini. Strategi pembelajaran pendidikan matematika I khususnya sub pokok bahasan bangun datar dan bangun ruang yang dapat dijadikan solusi adalah model pembelajaran matematika dengan menggunakan alat peraga untuk meningkatkan kompetensi mahasiswa.

Bagaimana penerapan bangun datar dan bangun ruang dengan menggunakan alat peraga untuk meningkatkan Kreativitas Mahasiswa Semester I Tahun Akademik 2013-2014.

## 2 KAJIAN PUSTAKA

### 2.1 Bangun Datar

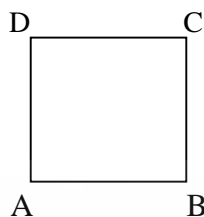
#### 2.1.1 Pengertian Bangun Datar

Bangun datar merupakan sebutan untuk bangun-bangun dua dimensi.

#### 2.1.1 Macam-macam Bangun Datar

- Persegi
- Persegi Panjang
- Segitiga
- Jajar Genjang
- Trapesium
- Layang-layang
- Belah Ketupat
- Lingkaran

#### Persegi



#### Pengertian Dasar

Dalam kehidupan sehari-hari kita sering melihat bangun datar yang berbentuk persegi panjang, tetapi panjang sisinya sama. Bangun ini disebut persegi. Contoh bangun persegi adalah bingkai foto, teralis jendela, dan ubin.

Dengan demikian persegi adalah persegi panjang yang keempat sisinya sama panjang.

#### Sifat-sifat persegi

1. Semua sisinya sama panjang dan sisi-sisinya yang berhadapan sejajar.
2. Setiap sudutnya siku-siku.
3. Mempunyai dua buah diagonal yang sama panjang, berpotongan di tengah-tengah, dan membentuk sudut siku-siku.
4. Setiap Sudutnya dibagi dua sama besar oleh diagonal-diagonalnya.
5. Memiliki 4 sumbu simetri.

#### Rumus luas dan keliling persegi

- Luas Persegi

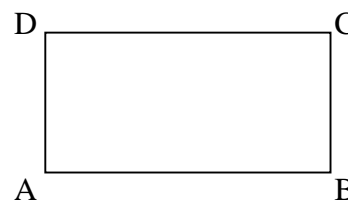
$$L = s^2$$

- Keliling Persegi

Keliling persegi panjang adalah jumlah panjang seluruh sisi-sisinya. Di tulis sebagai berikut,

$$K = 4s$$

#### Persegi Panjang



#### Pengertian Dasar

Persegi panjang adalah segi empat dengan sisi-sisi yang berhadapan sejajar dan sama panjang, serta keempat sudutnya siku-siku.

Sifat-sifat persegi panjang

1. Sisi-sisi yang berhadapan sama panjang dan sejajar. Setiap sudutnya siku-siku.
2. Setiap sudutnya siku-siku.
3. Mempunyai dua buah diagonal yang sama panjang dan saling berpotongan di titik pusat persegi panjang. Titik tersebut membagi diagonal menjadi dua bagian sama panjang.
4. Mempunyai 2 sumbu simetri yaitu sumbu vertikal dan horisontal.

Rumus luas dan keliling persegi panjang

- Luas Persegi panjang  
Luas persegi panjang sama dengan hasil kali panjang dan lebarnya. Dapat ditulis sebagai berikut:

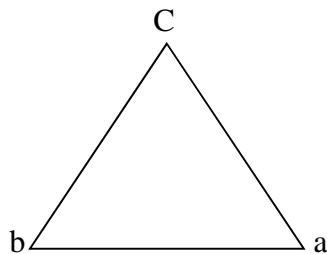
$$L = p \times l$$

Keterangan: p = panjang  
l = lebar

- Keliling Persegi panjang  
Keliling persegi panjang sama dengan jumlah seluruh panjang p dan lebar l, maka dapat ditulis sebagai:

$$K = 2p + 2l \\ = 2(p + l)$$

Segitiga



Pengertian Dasar

Sebuah segitiga terbentuk apabila tiga titik yang tidak terletak pada satu garis lurus saling dihubungkan. Hal ini berarti:

Segitiga adalah bidang datar yang dibatasi oleh tiga garis lurus dan membentuk tiga sudut.

1. Jenis-jenis segitiga ditinjau dari panjang sisi-sisinya:
  - a. Segitiga sama kaki  
Segitiga sama kaki terbentuk dari dua segitiga siku-siku kongruen yang

diletakkan bersisian dan berhimpit pada sisi siku-siku yang sama panjang.

Dari uraian diatas dapat disimpulkan bahwa: "Segitiga sama kaki terbentuk dari dua segitiga siku-siku kongruen yang beripit pada sisi siku-siku yang sama panjang."

- b. Segitiga sama sisi  
Segitiga sama sisi adalah segitiga yang ketiga sisinya sama panjang.
- c. Segitiga sembarang  
Segitiga yang panjang sisi-sisinya tidak mencirikan segitiga sama kaki maupun sama sisi disebut segitiga sembarang. Dari pernyataan diatas dapat pula dinyatakan sebagai berikut:  
Segitiga sembarang adalah segitiga yang ketiga sisinya tidak sama panjang.

2. Jenis segitiga ditinjau dari sudu-sudutnya  
Pada topik sebelumnya kita telah mempelajari jenis segitiga ditinjau dari panjang sisi-sisinya. Sekarang kita akan meninjau jenis segitiga berdasarkan ukuran sudut-sudutnya.

Apabila segitiga ditinjau dari ukuran-ukuran sudut, maka nama segitiga itu mengikuti nama ukuran sudutnya, yaitu:

- a. Segitiga yang krtiga sudutnya lancip disebut segitiga lancip.
- b. Segitiga yang salah satu sudutnya siku-siku disebut segitiga siku-siku.
- c. Segitiga yang salah satu sudutnya tumpul disebut segitiga tumpul.

3. Jenis segitiga ditinjau dari panjang sisi-sisi dan besar sudutnya

- a. Segitiga sama kaki  
Segitiga sama kaki jika dikaitkan dengan besar sudut-sudut yang mungkin terbentuk adalah: segitiga siku-siku sama kaki, segitiga lancip sama kaki, segitiga tumpul sama kaki
- b. Segitiga sama sisi  
Segitiga sama sisi jika dikaitkan dengan besar sudut-sudutnya adalah besar tiap sudutnya 60°. Untuk segitiga sama sisi tidak ada penamaan khusus seperti segitiga sama kaki.

3. Segitiga sembarang  
Segitiga sembarang yang mungkin terbentuk jika dikaitkan dengan besar sudut-sudutnya adalah: segitiga siku-siku, segitiga lancip sembarang atau disebut

segitiga lancip, segitiga tumpul sembarang atau sering disebut segitiga tumpul.

**Sifat-sifat segitiga**

1. Segitiga siku-siku  
Segitiga siku-siku mempunyai dua siku-siku yang mengapit sudut siku-siku dan satu sisi miring(hypotenusa).
2. Segitiga sama kaki  
Didalam segitiga sama kaki terdapat:
  - a. Dua sisi yang sama panjang,sisi tersebut sering disebut kaki segitiga.
  - b. Dua sudut yang sama besar yaitu sudut yang berhadapan dengan sisi yang panjangnya sama.
  - c. Satu sumbu simetri.
3. Segitiga sama sisi  
Didalam segitiga sama sisi terdapat:
  - a. Tiga sisi yang sama panjang.
  - b. Tiga sudut yang sama besar.
  - c. Tiga sumbu simetri.

**Rumus luas dan keliling persegi panjang**

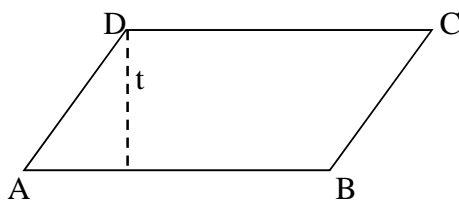
Luas segitiga =  $\frac{1}{2} \times a \times t$   
Keterangan: a = alas  
t = tinggi

Panjang sisi miring segitiga siku-siku dicari dengan rumus Phitagoras

$$(A^2 + B^2 = C^2)$$

Keliling segitiga =  $a + b + c$

**Jajar Genjang**



**Pengertian dasar**

Jajar gejang adalah segi empat dengan kekhususan yaitu sisi yang berhadapan sejajar dan sama sama panjang.  
Sifat-sifat yang dimiliki oleh jajargenjang adalah:

1. Sisi-sisi yang berhadapan sama panjang dan sejajar.
2. Sudut-sudut berhadapan sama besar.
3. Mempunyai dua buah diagonal yang berpotongan di satu titik dan saling membagi dua sama panjang.
4. Mempunyai simetri putar tingkat dua dan tidak memiliki simetri lipat

**Luas dan keliling jajar genjang**

Luas jajargenjang =  $a \times t$   
Keterangan: a = alas  
t = tinggi

**Keliling jajargenjang**

Menentukan keliling jajargenjang dapat dilakukan dengan cara menjumlahkan semua panjang sisinya. Sisi-sisi pada jajargenjang yang sejajar dan sama panjang. Misal apabila panjang 2 sisi yang tidak sejajar masing-masing adalah m dan n, maka keliling jajargenjang ditentukan oleh:

$$\text{Keliling} = m + n + m + n = 2(m + n),$$

dimana m dan n adalah sisi-sisi yang sejajar.

Persegi panjang adalah segi empat dengan sisi-sisi yang berhadapan sejajar dan sama panjang, serta keempat sudutnya siku-siku.

**Trapesium**



**Pengertian dasar**

Trapesium adalah segi empat yang memiliki sepasang sisi berhadapan sejajar.

Jenis – jenis trapesium antaralain :

- Trapesium sembarang  
Trapesium dikatakan trapesium sembarang jika trapesium tersebut tidak memiliki kekhususan
- Trapesium siku – siku  
Trapesium siku – siku adalah trapesium yang memiliki sudut siku – siku
- Trapesium sama kaki

Trapesium sama kaki adalah trapesium yang kaki - kakinya sama panjang

Sifat-sifat yang dimiliki oleh trapesium

- Sisi-sisi yang berhadapan sejajar.
- $\angle A + \angle D = 180^\circ$  .(sudut dalam sepihak)
- $\angle B + \angle C = 180^\circ$  .(sudut dalam sepihak)

Sifat-sifat khusus yang dimiliki oleh trapesium sama kaki

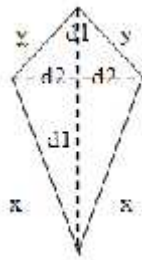
- Terdapat dua pasang sudut berdekatan yang sama besar
- Dalam trapesium sama kaki terdapat diagonal – diagonal yang sama panjang
- Luas dan keliling trapesium

- Luas =  $\frac{1}{2} (k_1 + k_2) t$

Keterangan: t = tinggi

- Keliling trapesium = alas + atap +

### Layang-layang



Pengertian dasar

Layang – layang adalah segi empat yang dibentuk oleh dua segitiga sama kaki yang alasnya sama panjang dan berhimpit.

Sifat-sifat yang dimiliki oleh layang - layang adalah:

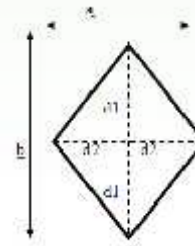
- Pada layang – layang terdapat dua pasang sisi yang sama panjang
- Pada layang – layang terdapat sepasang sudut berhadapan yang sama besar
- Pada layang – layang terdapat satu sumbu simetri yang merupakan diagonal terpanjang

- Pada layang – layang salah satu diagonalnya membagi dua sama panjang diagonal lainnya secara tegak lurus

Luas dan keliling Layang – layang

- Luas =  $\frac{1}{2} d_1 d_2$
- Keliling layang – layang =  $2(x + y)$

### Belah ketupat



Pengertian Dasar

Belah ketupat adalah segi empat yang dibentuk dari segitiga sama kaki dan bayangannya, dengan alas sebagai sumbu cermin.

Sifat-sifat belah ketupat

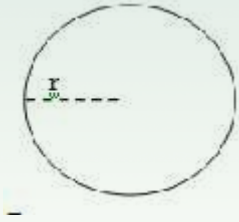
- Semua sisinya sama panjang.
- Sudut-sudut yang berhadapan sama besar dan dibagi dua sama besar oleh diagonal-diagonalnya.
- Kedua diagonalnya saling membagi dua sama panjang dan saling tegak lurus
- Kedua diagonal belah ketupat merupakan sumbu simetrinya.

Rumus luas dan keliling belah ketupat

- Luas belah ketupat  
Luas =  $\frac{1}{2} (a \times b)$   
Atau Luas =  $\frac{h \times p \times d}{2}$   
Keterangan: a = diagonal 1  
b = diagonal 2

- Keliling Persegi panjang  
Keliling belah ketupat =  $4 \times p$

**Lingkaran**



**Pengertian dasar**

Lingkaran adalah himpunan titik-titik yang berjarak sama.

**Luas dan keliling lingkaran**

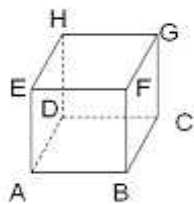
- Luas =  $\pi r^2$   
Keterangan: r= jari-jari
- Keliling lingkaran =  $\pi \times d$       $2 \times \pi \times r$

**2.2 Bangun Ruang**

1. Pengertian Bangun Ruang  
Bangun ruang merupakan sebutan untuk bangun-bangun tiga dimensi.
2. Macam-Macam Bangun Ruang  
Jenis bangun ruang antara lain:

- Kubus
- Balok
- Prisma tegak segitiga siku - siku
- Tabung
- Kerucut
- Limas
- Bola

**Kubus**



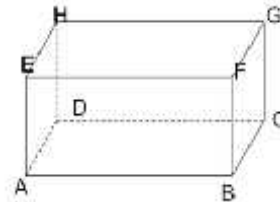
- a. Ciri - ciri Kubus :
  1. Jumlah bidang sisi ada 6 buah yang berbentuk bujur sangkar (ABCD, EFGH, ABFE, BCGF, CDHG, ADHE,)
  2. Mempunyai 8 titik sudut (A, B, C, D, E, F, G, H)

3. Mempunyai 12 rusuk yang sama panjang (AB, CD, EF, GH, AE, BF, CG, DH, AD, BC, EH, FG)
4. Semua sudutnya siku-siku
5. Mempunyai 4 diagonal ruang dan 12 diagonal bidang (4 diagonal ruang = garis AG, BH, CE, DF dan 12 diagonal bidang = garis AC, BD, EG, FH, AH, DE, BG, CF, AF, BE, CH, DG)

b. Rumus pada kubus

- Diagonal Bidang =  $u\sqrt{2}$
- Diagonal Ruang =  $u\sqrt{3}$
- Luas permukaan =  $6u^2$
- Volume =  $u^3$
- Jarak C terhadap BDG =  $\frac{1}{3}u\sqrt{3}$
- Jarak ACH terhadap BEG =  $\frac{1}{3}u\sqrt{3}$
- Jarak E terhadap BDG =  $\frac{2}{3}u\sqrt{3}$

**Balok**



a. Ciri-ciri Balok :

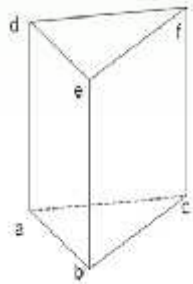
1. Alasnya berbentuk segi empat
2. Terdiri dari 12 rusuk
3. Mempunyai 6 bidang sisi
4. Memiliki 8 titik sudut
5. Seluruh sudutnya siku-siku
6. Mempunyai 4 diagonal ruang dan 12 diagonal bidang

b. Rumus pada balok

- Panjang semua rusuk balok :  $4(p + l + t)$
- Panjang diagonal sisi balok  $d_1, d_2, d_3$  :  
 $d_1 = \sqrt{p^2 + l^2}, d_2 = \sqrt{p^2 + t^2}, d_3 = \sqrt{l^2 + t^2}$

- Panjang diagonal ruang balok :  $d = \sqrt{p^2 + l^2 + t^2}$  cm
  - Luas sisi balok =  $2pl + 2pt + 2lt$
  - Luas bidang diagonal :  $L_d = l\sqrt{p^2 + t^2}$ ,  $L_d = p\sqrt{l^2 + t^2}$ ,  $L_d = t\sqrt{p^2 + l^2}$
  - Volume  $p \times l \times t$
- Rumus tabung
- Volume tabung = luas alas x tinggi
  - Luas alas = luas lingkaran alas tabung =  $\pi \times r^2$
  - Dengan  $\pi = \frac{2}{7} \approx 3,14$
  - Jadi Volume tabung =  $\pi \times r^2 \times t$
  - Luas Permukaan Tabung = 2 x luas alas + Luas selimut tabung =  $(2 \times \pi \times r^2) + (2 \times \pi \times r \times t)$  =  $2 \times \pi \times r(r + t)$

**Prisma Tegak segitiga siku-siku**



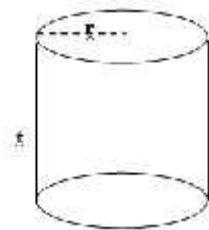
- a. Ciri-ciri :
1. Terdiri dari 6 titik sudut
  2. Mempunyai 9 buah rusuk
  3. Mempunyai 5 bidang sisi
- b. Rumus Prisma tegak segitiga siku – siku
- Luas sisi prisma : jumlah panjang rusuk alas x tinggi + luas 2 tutup
  - Volume prisma : luas alas x tinggi

**Kerucut**



- a. Ciri-ciri :
1. Mempunyai 2 bidang sisi (1 bidang sisi lingkaran dan 1 bidang sisi selimut)
  2. Mempunyai 2 rusuk dan 1 titik sudut
- b. Rumus kerucut
- Luas selimut =  $\pi r t$
  - Luas alas =  $\pi r^2$
  - Luas Permukaan kerucut = Luas alas + Luas Selimut =  $\pi r^2 + \pi r t$  =  $\pi r(r + t)$
  - Volume = Luas alas x tinggi =  $\pi r^2 t$

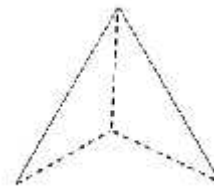
**Tabung / silinder**



- a. Ciri-ciri:
1. Mempunyai 2 rusuk
  2. Alas dan atapnya berupa lingkaran
  3. Mempunyai 3 bidang sisi ( 2 bidang sisi lingkaran atas dan bawah, 1 bidang selimut)

**Limas**

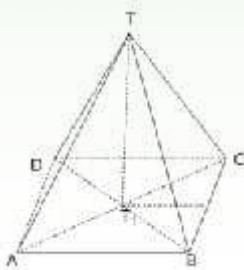
a. Limas Segitiga



- a. Ciri-ciri :
1. Alasnya berbentuk segitiga
  2. Mempunyai 4 bidang sisi (alas dan 3 sisi tegak)
  3. Mempunyai 6 rusuk

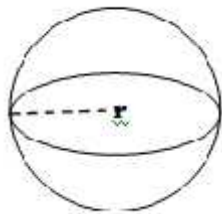
4. Mempunyai 4 titik sudut
- b. Rumus Limas segitiga
  - Luas alas = alas x tinggi
  - Volume = Luas alas x tinggi
  - Luas = Luas alas + (3 x luas tegak segitiga)

**Limas Segiempat**



- a. Ciri-ciri :
  1. Alasnya berbentuk segiempat (BCDE)
  2. Mempunyai 5 bidang sisi (BCDE, ABC, ACD, ABE, ADE)
  3. Mempunyai 5 titik sudut ( A, B, C, D, E)
  4. Mempunyai 8 rusuk (AB, AC, AD, AE, BC, CD, DE, BE)
- b. Rumus limas segiempat
  - Volume Limas = Luas alas x tinggi

**Bola**



- a. Ciri-ciri :
  1. Hanya mempunyai 1 bidang sisi
  2. Tidak mempunyai sudut dan tidak mempunyai rusuk
- b. Rumus bola
  - Volume =  $\frac{4}{3} \pi \times r^3$
  - Luas =  $4 \pi r^2$

**3 METODE**

**3.1 Subjek Lesson Study**

Subjek yang bertindak dalam Lesson Study ini adalah Mahasiswa-mahasiswi semester I (Satu) Tahun Akademik 2013-2014

**3.2 Rancangan Pelaksanaan Lesson Study**

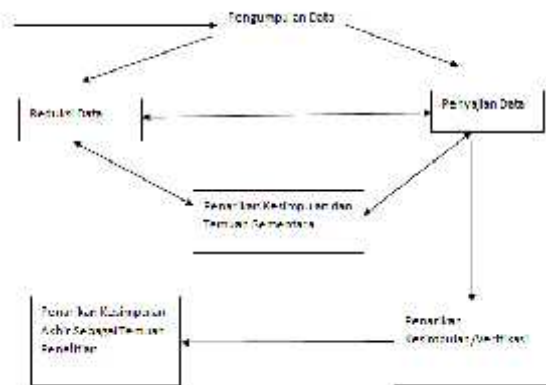
Jumlah siklus dalam Lesson Study ada empat kali di mana Perencanaan (Plan) di ruang Prodi PGSD dengan Observer 9 dan Satu Dosen Model, Pelaksanaan (Do) Lesson Study dengan Mata Kuliah Pendidikan Matematika I (Bangun datar dan bangun ruang) di ruang 28 PGSD Kampus B, Lantai III UMMU Ternate, dan Refleksi (See) Lesson Study di Ruang PGSD dengosen Model.

**3.3 Teknik dan Instrumen Pengumpulan Data**

Teknik dalam Lesson Study ini adalah Observasi dan Dokumentasi

**3.4 Teknik Analisa Data**

Dalam Lesson Studi ini memakai analisis Hubermas yaitu dengan urutan sebagai berikut pengumpulan data, display data, reduksi data dan mengambil kesimpulan/verifikasi (Poerwanti, 2000:32-33)



#### 4 HASIL DAN PEMBAHASAN

*Pertama*, kondisi pembelajaran pendidikan matematika I yang dijadikan lokasi penelitian secara umum sudah berjalan baik, sebagaimana dapat dilihat dari hasil penelitian yaitu: mahasiswa secara umum sudah memahami tujuan yang dikembangkan dalam rencana pembelajaran dalam empat siklus ini. Dalam pengembangan tujuan pembelajaran sudah sesuai dengan Silabus/Kurikulum. Meskipun begitu Dosen Model masih menunjukkan kekurangan optimal dalam menentukan tujuan, dikarenakan masih suka terpaku pada salah satu kemampuan keompok mahasiswa saja, yaitu kemampuan kognitif. Ditelaah dari metode yang digunakan dosen model dalam penyampaian materi pembelajaran matematika (bangun datar dan bangun ruang) cukup bervariasi dengan menggunakan alat peraga dalam pembelajaran Matematika sudah dilaksanakan. Metode yang sudah dilaksanakan diantaranya adalah metode ceramah, penugasan Kelompok, dan Tanya Jawab.

Sumber yang digunakan dosen model dalam pembelajaran pendidikan matematika I cenderung masih tertumpu pada sumber belajar yang tersedia di kampus. Buku paket yang ada di kampus dijadikan sebagai sumber utama, sedangkan penunjang yang digunakan adalah buku yang pada tahun-tahun sebelumnya digunakan. Sumber belajar masih terikat pada sumber yang tercantum di dalam kurikulum. Sedangkan kalau menggunakan sumber lainnya yang lebih bagus, kampus harus mengeluarkan biaya yang cukup besar, sehingga terkadang dosen mode matematika mempertimbangkan segi positif dan negatifnya dalam penggunaan sumber belajar/alat peraga tersebut.

Sarana yang digunakan dosen model dalam kegiatan pembelajaran matematika PGSD lokasi Lesson Study, terutama untuk menunjang pelaksanaan pembelajaran Matematika adalah tersedianya Infokus, dan Alat Peraga Bangun datar dan bangun

Peran mahasiswa dalam kegiatan pembelajaran pendidikan matematika I secara umum cenderung masih kurang optimal. Aktivitas siswa dalam kegiatan pembelajaran di kampus terutama dalam pembelajaran matematika masih suka agak gaduh. Dalam tugas-tugas kelompok pembelajaran seperti pekerjaan kelompok dan tugas pembelajaran lainnya mahasiswa sudah menyelesaikannya meskipun belum semuanya benar. Suasana kelas kalau ditinggal oleh dosen terkadang langsung ribut, karena mahasiswa banyak yang suka ikut keluar ruangan. Evaluasi yang dilakukan dosen dalam

pembelajaran matematika selama ini yaitu evaluasi pada setiap akhir pertemuan.

*Kedua*, pengembangan program pembelajaran Lesson Study pendidikan matematika Idengan menggunakan alat peraga dalam meningkatkan kemampuan mahasiswa secara umum dilakukan melalui tahap perencanaan (Plan), pelaksanaan (Do), dan Refleksi (See) sebagai berikut:

a. Perencanaan (Plan) pengembangan alat peraga bangun datar dan bangun ruang yaitu: (1) model pembelajaran dengan menggunakan alat peraga mengacu kepada komponen-komponen perencanaan pembelajaran yaitu: (a) pengenalan, (b) penyajian informasi, (c) pertanyaan dan respon jawaban, (d) penilaian respon di mana mengacu kepada komponen pencapaian pembelajaran sebagai berikut: (a) penyajian masalah-masalah dalam bentuk tugas kelompok soal pada tingkat tertentu dari penampilan/persentase mahasiswa; (b) mahasiswa mengerjakan soal-soal latihan yang ada di LKM dan mengevaluasi kemudian memberikan umpan balik/diskusi.

b. Pelaksanaan ( Do)

Pembelajaran pendidikan matematika I menggunakan alat peraga pada yaitu:

1) Tahap-tahap yang dilakukan dalam pelaksanaan pembelajaran, yaitu: (a) tahap pengenalan/pengantar meliputi : (1) penampilan judul yaitu halaman judul yang di tampilkan dengan power poin slait gambar tentang bangun datar dan bangun ruang; (2) menginformasikan tujuan pembelajaran atau kompetensi yang diharapkan, meliputi standar kompetensi, kompetensi dasar dan indikator; (3) menampilkan petunjuk penggunaan alat peraga; (4) menampilkan stimulasi pengetahuan yang dilakukan oleh mahasiswa dengan diskusi kelompok dengan menggunakan alat peraga bangun datar dan bangun ruang.

c. Refleksi (See)

Pembelajaran pendidikan matematika materi bangun datar dan bangun ruang dengan menggunakan alat peraga yaitu dilakukan pada awal proses pembelajaran, saat proses pembelajaran dan di akhir proses pembelajaran.

Dari hasil Refleksi dari observer bahwa proses pembelajaran menunjukkan bahwa dosen model masih agak kaku dan cenderung monoton dalam menyampaikan materi dalam Menggunakan alat peraga. Ditelaah dari aktivitas mahasiswa sudah menunjukkan antusiasnya. Hanya beberapa siswa yang masih agak canggung dalam menggambar alat peraga pembelajaran matematika dengan bangun



datar dan bangun ruang. Evaluasi terhadap keberhasilan belajar mahasiswa dilaksanakan dengan melalui (tes akhir/LKM). Dari hasil evaluasi diketahui bahwa ada peningkatan kemampuan mahasiswa antara sebelum dan sesudah melaksanakan pembelajaran dengan menggunakan alat peraga bangun datar dan bangun ruang.

## 4 KESIMPULAN DAN SARAN

### 4.1 Kesimpulan

Kondisi pembelajaran pendidikan matematika (Bangun datar dan Bangun ruang) yang dijadikan lokasi penelitian secara umum sudah berjalan baik, sebagaimana dapat dilihat dari:

- Pemahaman mahasiswa terhadap tujuan pendidikan matematik I, secara umum sudah memahami tujuan yang dikembangkan dalam rencana pembelajaran.
- Sumber yang digunakan dosen dalam pembelajaran matematika cenderung masih tertumpu pada sumber belajar yang tersedia di kampus.
- Sarana yang digunakan dosen dalam kegiatan pembelajaran matematika, terutama untuk menunjang pelaksanaan pembelajaran Matematika adalah tersedianya infokus dan alat penunjang lainnya.
- Evaluasi yang dilakukan dosen dalam pembelajaran matematika selama ini yaitu evaluasi pada setiap akhir pertemuan.

Pembelajaran pendidikan matematika I dengan menggunakan alat peraga ternyata lebih efektif jika dibandingkan dengan tidak menggunakan alat peraga pada bahasan bangun datar dan bangun ruang. Ternyata siswa terlihat lebih antusias dalam kegiatan pembelajarannya dengan menggunakan alat peraga.

### 4.2 Saran

Semoga makalah ini dapat bermanfaat bagi penulis khususnya dan bagi yang membaca makalah ini.

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## Global Standard: Its Purpose, Principles and Framework

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**Abstract:** This paper focuses on insights from the Global Standard (GS) in the Education of Medical Doctors (EMD) which can be of great use in Initial Teacher Education (ITE). There is a firm rationale for introducing the GS into EMD: the present mobility of medical doctors across the globe. This aspect especially applies to ITE in countries such as those in the EU or in China and Japan. In this situation, quality assurance in ITE is indispensable. However, there is a pitfall in the GS: the use of the standard to assess the performance of school teachers by means of numerical targets or attainment targets, such as Can-Do lists or checklists. This framework critically fails to recognise that the professionalism of the performance by both teachers and medical doctors consists of competency as well as capability. The ultimate goal of a standard is an enhancement of the overall quality of teachers, and a huge difference between ITE and the teachers' licensing system exists in each country. Therefore, in order to be fit for a different context of ITE, the GS should be construed as a lenient framework or should just show a broad view of desirable, would-be teachers. That is, we should not try to concretise all the competencies required for teachers, an approach which is adopted in the GS in EMD because competency-based standards have difficulties in themselves and capability must be regarded as significant.

**Keywords:** Global Standard, Initial Teacher Education, Education of Medical Doctors, Competency, Capability

### 1 INTRODUCTION

This paper focuses on how Global Standard (GS) is conceptualised and how it can be best made use of in Initial Teacher Education (ITE), taking into consideration both the current situation and discussions in the Education of Medical Doctors (EMD), because there can well be a disparity in the underpinning concept of the GS between ITE and EMD.

### 2 BACKGROUND OF THE GS IN EMD

There is a firm rationale for introducing the GS into EMD: the present mobility of medical doctors across the globe. In this situation, quality assurance in education is indispensable from the point of view in order to ensure that all medical doctors have a common minimum competency and set of skills.

According to *The Oxford Advanced Learner's Dictionary*, “standard” is defined as: 1. a level of quality, especially one that people think is acceptable. 2. a level of quality that is normal or acceptable for a particular person or in a particular situation. In short, “standard” is mainly concerned with the “quality” of, in this case, medical doctors: therefore, the GS has been prevailing in EMD,

especially in the search for world-wide quality assurance.

However, it seems that the contemporary mobility of medical doctors is a rather passive motive about introducing the GS. Rather, it appears to be possible to make the most of this opportunity for enhancing the professionalism of medical doctors in EMD in general.

### 3 STANDARDS IN ITE

The condition in EMD especially applies to ITE in countries such as those in the EU or in China and Japan, the governments of which recruit quite many native speakers of English for schools. At this moment, there is no such movement as establishing a GS in ITE, although several countries have already made or have been trying to make nation-wide standards in ITE <sup>(1)</sup>.

Specifically with regard to the current movement in the field of standards for English Language Education (ELE), Can-Do lists or a checklist type of standards seem to prevail, such as the *European Portfolio for Student Teachers of Languages* (EPOSTL), and the “J-POSTL” (Japanese Portfolio for Student Teachers of Languages) and the “J-POTL” (Japanese Portfolio for Teachers of Languages), both

of which have been developed, on the basis of the EPOSTL, by The Japan Association of College English Teachers (JACET) Special Interest Group on English Education.

The followings are the typical extracts from the EPOSTL.

EPOSTL is a document for students undergoing initial teacher education. It will encourage you to reflect on your didactic knowledge and skills necessary to teach languages, helps you to assess your own didactic competences and enables you to monitor your progress and to record your experiences of teaching during the course of your teacher education.(p.3)

#### 4 THE ROLE OF THE LANGUAGE TEACHER

- I can promote the value and benefits of language learning to learners, parents and others.
- I can appreciate and make use of the value added to the classroom environment by learners with diverse cultural backgrounds.
- I can take into account the knowledge of other languages learners may already possess and help them to build on this knowledge when learning additional languages.
- I can draw on appropriate theories of language, learning, culture etc. and relevant research findings to guide my teaching.
- I can critically assess my teaching on the basis of experience, learner feedback and learning outcomes and adapt it accordingly.
- I can critically assess my teaching in relation to theoretical principles.
- I can accept feedback from my peers and mentors and build this into my teaching.
- I can observe my peers, recognise different methodological aspects of their teaching and offer them constructive feedback.
- I can locate relevant articles, journals and research findings relating to aspects of teaching and learning.
- 10. I can identify and investigate specific pedagogical/ didactic issues related to my learners or my teaching in the form of action research. (pp.17-18)

Obviously, above is a Can-Do list for trainee teachers.

Basically, both the "J-POSTL" and the "J-POTL" also consist of a set of Can-Do lists or checklists with huge numbers of detailed attainment targets or minute assessing points. This reveals that ITE and Teacher Education (TE) in ELE are to be regarded as skill-oriented/getting or skill-centred education, in order to assess the required competency for trainee teachers or in-service teachers.

Similar types of standards can also be found in different TE settings in Japan, such as the "Model

Core Curriculum for Teacher Education"<sup>(2)</sup> by The Japan Association of Universities of Education and the "Teacher Education Standards"<sup>(3)</sup> of the Hyogo University of Teacher Education in Japan, all of which are competency-based, Can-Do lists or a checklist type of standards.

It can be stated that specifically in ELT and in ITE in Japan competency-based, Can-Do lists or a checklist type of standards are the mainstream.

#### 5 PROBLEMS IN COMPETENCY-BASED STANDARDS

According to *The New Oxford American Dictionary*, "competency" is defined as "the ability to do something successfully or efficiently". In the ITE and TE context, this means that both knowledge and skills for implementing lessons must be acquired in order to complete the job successfully.

However, acquiring the competencies in the list does not always secure their "good practice", as professionals have mastered more than a limited professional range of competencies. Therefore, the vital points which should be considered here are: 1. It is quite unlikely that we can ever produce a complete list by the use of which to assess the outcomes of trainee teachers and school teachers, for professionals possess more than knowledge and skills which are visible from the outside (i.e., outcomes). 2. Even if the items on the Can-Do lists or the checklists are completely mastered by both trainees and teachers, this does not necessarily mean that they are "professionals" because they are not such simple people as to have just acquired every item in the list as a separate, stand-alone piece of knowledge or skill. The items in the lists must be interwoven with one another. One of the plausible questions here would be: how can "Reflectivity" be properly assessed by using Can-Do lists or checklists? It is not at all an easy task to disclose, by means of Can-Do lists or checklists, the degree of "Reflectivity" trainee teachers and school teachers have at the moment, for various complex features are included in "Reflectivity".

Moreover, a pitfall in competency-based standards is often described as a worrisome risk: the use of the standard to assess the performance of teachers by means of numerical targets or attainment targets—that is, how many attainment targets in the Can-Do lists or checklists have they achieved.

Therefore, competency-based, Can-Do lists or a checklist type of standards are not considered to be the ultimate goal for the GS in ITE.

#### 6 THE GS IN EMD

One characteristic aspect of the GS in EMD is that professional attributes including "professional

attitude” (i.e., behavioural aspects) are greatly emphasised. An interesting research on suitability/apptitude for professionals is implemented in EMD: disciplinary action among practicing physicians by medical boards has been strongly associated with unprofessional behavior in medical school (4). In other words, competency is viewed as only one part of assessing the ability of professionals in EMD. Therefore, the theoretical framework of the curriculum in EMD is constructed with “attitudes” of trainee doctors, which is shown in Figure 1 (5).

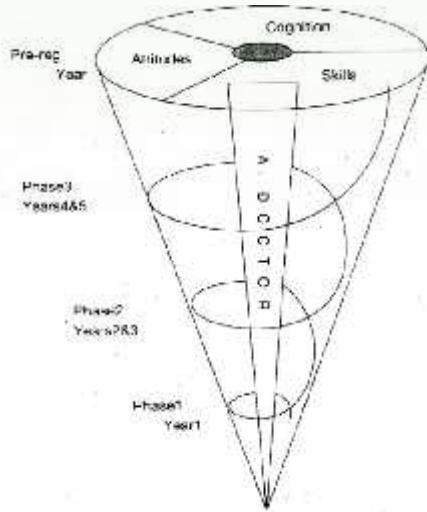


Figure 1. A model of a spiral curriculum in EMD

One concept which is closely connected with professional attributes and which plays a vital role for professionals is “capability”, which is defined in *The Oxford Advanced Learner’s Dictionary* as “the ability or qualities necessary to do something”, which can be called an “intangible quality” in my terms. Capability is indispensable attribute or aptitude if a person is to do a professional job. Lacking it, professionals cannot practice their trade properly. Therefore, the GS in such EMD as the *WFME Global Standards for Quality Improvement* by the World Federation for Medical Education (WFME) and the *European Core Curriculum: The Students’ Perspective* are not of the Can-Do list or check-list type, but just show a broad framework of reference to the required abilities, including professional attitudes for trainee doctors and doctors. In this sense, it can be stated that the framework of competency-based, Can-Do lists or a checklist type of standards in ITE critically lack the essential point that the professionalism of the performance by school teachers consists of not only “competency” but also “capability”.

The followings are some extracts from the *WFME Global Standards for Quality Improvement*.

#### PURPOSE

- Standards should be concerned with broad categories of the content, process, educational environment and outcome of medical education.
- Standards should function as a lever for change and reform. Standards should be formulated in such a way as to acknowledge regional and national differences in the educational programme, and allow for different profiles and developments of the individual medical schools, respecting reasonable autonomy of the medical schools.
- Use of a common set of international standards does not imply or require complete equivalence of programme content and products of medical schools.
- Standards should recognise the dynamic nature of programme development.
- Standards are formulated as a tool which medical schools can use as a basis and a model for their own institutional and programme development. Standards should not be used in order to rank medical schools.
- Standards are intended not only to set minimum requirements but also to encourage quality development beyond the levels specified. The set of standards, in addition to basic requirements, should include directions for quality development.
- Standards should be further developed through broad international discussion and consensus.
- The value of the standards must be tested in evaluation studies in each region. Such projects should be based on a combination of voluntary institutional self-evaluation and peer review.(p.6)

AREAS are defined as broad components in the structure, process and outcome of medical education and cover:

- Mission and Objectives
- Educational Programme
- Assessment of Students
- Students
- Academic Staff/Faculty
- Educational Resources
- Programme Evaluation
- Governance and Administration
- Continuous Renewal(p.8)

#### EDUCATIONAL OUTCOME

Basic standard:

The medical school **must** define the competencies that students should exhibit on graduation in relation to their subsequent training and future roles in the health system.

Quality development:

The linkage of competencies to be acquired by

graduation with that to be acquired in postgraduate training **should** be specified. Measures of, and information about, competencies of the graduates **should** be used as feedback to programme development.

Annotations

- Educational outcomes would be defined in terms of the competencies the students must acquire before graduation.
- Competencies within medicine and medical practice would include knowledge and understanding of the basic, clinical, behavioural and social sciences, including public health and population medicine, and medical ethics relevant to the practice of medicine; attitudes and clinical skills (with respect to establishment of diagnoses, practical procedures, communication skills, treatment and prevention of disease, health promotion, rehabilitation, clinical reasoning and problem solving); and the ability to undertake lifelong learning and professional development. (p.9)

It is obvious that the underpinning concept of the GS in EMD is different from that of the GS in ELT and in ITE in Japan. Interestingly, the *Teachers' Standards* in England and the *Professional Standards for the Accreditation of Teacher Preparation Institutions* in the United States are close in construction to the GS by WFME, both of which include a feature of professional attributes and are not merely Can-Do lists or a checklist type of standards.

## 7 CONCLUSION

It is worthwhile introducing the GS to ITE and TE because of the factors currently internationally affecting education in general: accountability, quality assurance, etc. Needless to say, the world-wide uniformity of teachers is not the goal of GS especially since a huge difference between ITE and the teachers' licensing system exists in each country. Therefore, it is reasonable and practical that the GS should focus on an enhancement of the overall quality of teachers, taking into consideration the present-day directions and trends in TE such as “reflective practice”.

In order to consider the GS, as we looked at it, competency-based standards consisting of Can-Do lists or checklists have a deficiency, which leads us to also highlight capability for professionals. Hence, it follows that GS should be construed as a lenient framework or should just show a broad view of desirable, would-be teachers, including both competency- and capability-features, an approach which is adopted in the GS in EMD.

## 8 NOTES

- The *Teachers' Standards* and the *Professional Standards for the Accreditation of Teacher Preparation Institutions* are the typical examples.
- See The Japan Association of Universities of Education, p.32.
- See Besso, p.445.
- See *The New England Journal of Medicine*.
- See Harden & Stamper.

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## Lesson Study: An Implemented Innovation in the Thai Context

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**Abstract:** Lesson Study, a Japanese way of professional development of teachers, has been developed dated back for nearly 140 years. In Thailand, it has been implementing Lesson Study since 2000 and has a unique way of adapting this Japanese professional development. Our experience on Lesson study has been sharing in APEC member economies during the last 6 years and has been said "quite success" in improvement of teaching and learning mathematics. In this paper, key concepts for implementing the lesson study such as "adaptive innovation", "Unit of analysis for making lesson study cycle" "how to determine lesson study team" Or, why "cutting "revision step" from the weekly/ cycle will be discussed. Then, the growth of Lesson Study in Thailand which almost all of them were implemented by Center for Research in Mathematics Education, Faculty of Education, Khon Kaen University will be stated. At last, factors affecting success in applying the Lesson Study in developing the teaching professional development included : the support by original affiliation of school, school administrators' support, collaboration with outside experts, awareness of changes in students as well as teacher, confidence in Lesson Study as an opportunity of professional development, teachers' experience in collaborative working of teachers participating in Lesson Study Process, and knowledge management approach will be discussed.

**Keywords:** Lesson Study, Implemented Innovation, Thai context

### 1 INTRODUCTION

Lesson Study is an innovation as a major method in professional development in Japan. It occurred more than one hundred years ago. It was accepted throughout the time as a technique leading to the better and sustainable teaching (Lewis and Berry, 2006). In addition, it was a guideline of Teacher-led instructional improvement. The teacher was a motivator in teaching improvement by themselves without waiting from the expert outsider experts. For major objective, it was the Student-focused. Therefore, this guideline was very useful for the teacher's instruction whether in content, teaching technique, or student's learning (Lewis, 2002; Lewis and Berry, 2006; Shimizu, 2006; Isoda, 2006; Wang, 2006).

The Lesson Study Innovation was dissemination from Japan to schools in the United States of America as the first country in 1999. It was rapid growth until now. In 2007, there were 13 countries in Asia Pacific Cooperation adopted the teaching professional development in their own countries. For Thailand, the guideline of Lesson Study was administered in the development since 2002 initiated by Maitree Inprasitha (2003) by piloting the teacher training project of Faculty of Education, Khon Kaen University, until 2009, there were 24 schools used the Lesson Study and Open Approach in teaching professional development.

Since the Lesson Study Innovation was accepted in many countries in that it was valuable for teachers because it could make change in teachers and

students. As a result, it was considered to be very appropriate with Thailand because in recent situation the teacher needed to improve their own teaching in order to affect the students' learning reform. Consequently, the application of Lesson Study in teaching professional development of Thailand, would be useful for teacher reform.

### 2 DEFINITION OF LESSON STUDY

The word "Lesson Study" was defined by Center for Research in Mathematics Education, Khon Kaen University, in order to replace an English Term "Lesson Study," by replacing the word "jogyokenkyu," in Japanese Language. For the word "jogyokenkyu," consisted of 2 words "jogyo" meant the classroom, and "kenkyu," which referred to study or conducting research (Yoshida, 2004). According to the letter, therefore, lesson study referred to "the study" or "classroom research". But, the meaning based on real Japanese Culture, when teachers wanted to use lesson study innovation, they would participate in well-developed process including: discussion of Lessons which they already planned and observed teaching together, called "kenkyujogyo" reversing the word "jogyokenkyu." It could be translated that "study or research the lesson" Specifically, in Japanese meaning "lesson" had specific meaning as "The object of one's study." The lesson study or classroom study referred to the "study," according to step of implementation in attempting to accomplish the research objective

chosen to work together by every teacher (such as to comprehend how to do for enhancing the students in being able to learn freely).

### **3 HISTORICAL BACKGROUND OF LESSON STUDY IN THAILAND**

Maitree Inprasitha (2006) stated the background of lesson study in Thailand concluding that the historical background of lesson study in Thailand starting at Faculty of Education, Khon Kaen University, its development was aligned with development of Open Approach. Assistant Professor Dr. Maitree Inprasitha administered the process of lesson study in the project enhancing self-studying with research grant from Khon Kaen University in 2002. The objective of that project was to study the changes in worldview of 15 internship students in Mathematics Education, Faculty of Education, Khon Kaen University, participated in the project. The students taught by the internship group throughout the first semester of 2002 school year, were surveyed their opinion.

In the same year, Maitree Inprasitha (2006) implemented the research project titled “Learning Reform in Mathematics in Schools by focusing on Mathematical Process,” supported by the Office of National Research Commission. In the project, 2 schools participated in: Secondary School --- Kokesee-pittayasan School, and Primary School—Suansanook Municipal, Muang District, Khon Kaen Province.

Later on, in 2003, after the establishment of Center for Research in Mathematics Education: CRME, the development and advertisement in lesson study was responsible by the center. In that year, Faculty of Education, by collaboration between Center for Research in Mathematics Education, and PLAN Organization of Thailand, launched the project “Development of Learning Plan based on guideline of National Educational Reform Act 2001 in each major learning substance by Lesson Study,” aiming for development of in-service teachers in the Office of Khon Kaen Educational Service Area 5, Mathematics Education Learning Substance, and Social Studies, Religion, and Culture Learning Substance, 50 teachers each learning substance, so that they could be able to develop the lesson plan and use in their own class.

In 2006, Faculty of Education, Khon Kaen University, on behalf of the former Dean (Associate Professor Dr. Suladda Loipha ) allowed the Center for Teaching Professional Development and Educational Personnel to collaborate with PLAN Organization of Thailand, implemented the project for developing in-service teachers in the Office of Mahasarakam Educational Service Area 1, and 2, in Mathematics, Science, Thai Language, and Social Studies, Religion, and Culture Learning Substances, by using model of lesson study the same as in 2003.

In the same year, the Center for Research in Mathematics Education, participated in pilot project of pilot school for growing wisdom as a joint project of the Office of Primary School, and the Office of Administration and Development of Body of Knowledge for school reform of the whole system by focusing on teachers for 2 pilot schools including: Chumchonbanchonnabot School, Chonabot District, and Koo-kam-pittayasan School, Samsung District, Khon Kaen Province. The duration of project implementation was 3 years (2006-2008). For the first year, development of open knowledge management plan in Mathematics was emphasized. The teachers and researchers from Center for Mathematics Education, school coordinators, and Master Degree Students participating in research by using both schools as a basis for research collaborating in creating the lesson plan very Sunday. Then, the school coordinators, researchers from Center for Research in Mathematics Education, and Master Degree Students participating in research, 5 persons each school, observed classroom every period. The reflection was performed every Wednesday for Chumchonbanchonnabot School, and every Thursday for Koo-kam-pittayasan School.

The lesson study became to be better known in Thailand when the Center for Research in Mathematics Education, Khon Kaen University, was assigned from APEC to collaborate with Japan in organizing seminar titled “Collaborative Study on Innovation for Teaching and Learning Mathematics in Different Cultures among the APEC Member Economies, 3 times continuously 3 years. For the first one, implemented during 14-17<sup>th</sup> June 2006. For the third one, it was held during 25-29<sup>th</sup> August 2008 at Khon Kaen Province. There were different countries both of APEC members and Non APEC members, total of 18 countries including: China, Chile, Hong Kong, Indonesia, Japan, Korea, Malaysia, Philippines, Singapore, Thailand, the United States of America, Brunai-karus-salam, Australia, Africa, Kambodia, Lao, England, and Vietnam.

In 2009, the Center for Research in Mathematics Education, Faculty of Education, Khon Kaen University, was appointed by the Office of Higher Education Commission, collaborated with the Office of Primary Education Commission, extended the findings from application of lesson study based on network development with higher education institutes in the area including: Chiangmai University and Ubonrachatani University by performing in 12 provinces from North Region and Northeast Region in 19 schools.

In 2011, The Center for Research in Mathematics Education allocated budget to support implementation of teaching professional development, and extended from 4 schools to 22 schools in the North Eastern Region, and 2 schools in North Region.

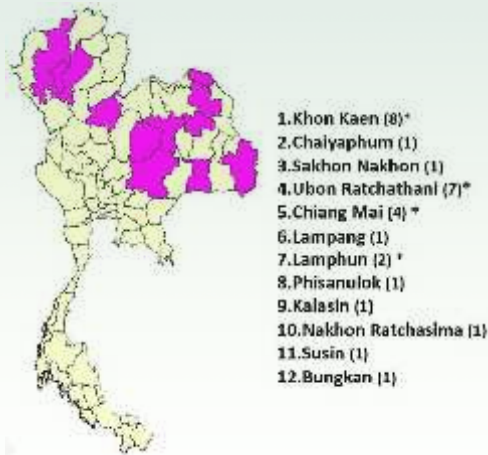


Figure 1. Innovation usage for schools in 2011

In 2013, Faculty of Education, Khon Kaen University agreed to be consultant for teacher development based on guidelines called Browser in Service by using process in developing the Coaching and mentoring through the innovation of Lesson Study, and Open Approach for the Office of Primary Educational Service Area, and the Office of Secondary Educational Service area, for 5 Educational Service Areas in the North Eastern Region as well as North Region, for 25 schools.

The outcome of project implementation being able to develop the Mathematics Classroom supporting the students' Mathematical Higher-order Thinking, caused by cooperation among Khon Kaen University, the work offices being responsible for Educational Policy, and schools as basic sub-units in Educational Reform of Thailand. In addition, for systematic enhancement and development of Mathematics Teaching Profession at Khon Kaen University, the institutions would be set up for international collaboration in order to conduct Research and Development in Mathematics Teaching Profession for the near future, prepared by Khon Kaen University. Moreover, Khon Kaen University tried hard for the Faculty of Education to extend the innovation usage of Lesson Study, and Open Approach to cover 20 provinces, 37 Educational Service Areas, under the name of "The Project for Development of Students' Higher-order Thinking in the North Eastern Region," including total of 50 schools.



Figure 2. Innovation usage for schools in 2014

The implementation under the above project, the Center for Research in Mathematics Education, since the extension of innovation usage for a large number of schools, there were limitations in the staffs to support the school practice. Consequently, the Center for Research in Mathematics Education administered the Coaching Online System by assigning the co-researchers to work at 10 network centers in different provinces. Besides, Coaching Online System was implemented from Faculty of Education, Khon Kaen University into different networks with researchers as key persons in collaboration for writing the Lesson Plan, answering the occurred questions, problems, and obstacles. After collaboration in lesson plan writing, the researcher and co-researcher team followed to various schools in order to collaborate in observing the classroom as well as reflecting the knowledge management based on Lesson Study Process.



Figure 3. The system of Coaching Online





Figure 4. The climate of Coaching Online

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Step 3: The classroom reflection, the administrators and every school teacher collaborated in classroom reflect activity which was organized once a week after class in any day. For classroom reflect activity, it should be organized once a week after class in any day scheduled together. The reflecting moderator should be director. This activity required every teacher to participate in reflection. The director had to control reflection to continue following collaborated agreement.

Step 4: The teachers’ learning conclusions, performed once a semester after the end of each semester, by teachers.

Step 5: The modification of knowledge management plan, was the adjustment in knowledge management plan and teaching again. It was the activity performing at the end of school year. The teachers used the knowledge management plan they used to administer it last school year, to be discussed in the advantage and disadvantage, and modified it for teaching again in next school year.

For writing report including knowledge management plan, students’ information, and reflected that what they had learned. During the first session, it wasn’t needed to performed since it might be too much burden for them. But, when school implemented activity in process of lesson study for a period of time, the director should encourage the teachers to write a report since it would be very useful for them because they could reflect their own learning as well as evidence and performance of their work in which they could use as professional utilization in future.

The process of lesson study could be shown by the following chart:

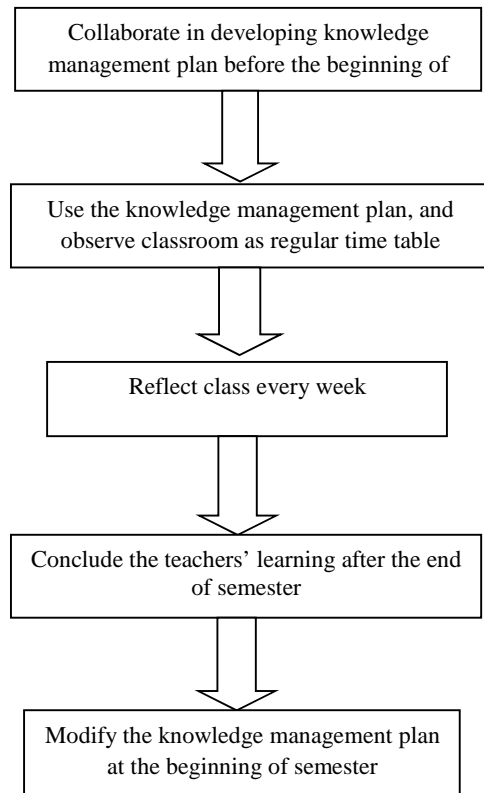


Figure 5. The Lesson Study Process Model

The details of activity in the lesson study process model of this research could be shown in the following table:

Table 1. Activity in the lesson study process model

The administrators and every school teacher	Set the long term goal in developing the students	Beginning of school year	once/school year	Notes
The teachers in lesson study group	Develop the knowledge management plan	During the end of semester, before the beginning of new semester	once/semester	At beginning, there should be outsider experts for providing suggestions.
The teachers in lesson study group	Use the knowledge management plan, and observe class.	Specified date in time table.	3 times a week	
The administrator and every school teacher.	Reflect the class	After class	Once a week	
The administrator and every school teacher.	Conclude the learning outcome.	The end of semester	Once a semester	
Teachers in the lesson study group	Modify the knowledge management plan	During the end of semester, before the beginning of semester	Once at the beginning of school year	Start to perform at the second year

## 6 FACTORS AFFECTING SUCCESS OF LESSON STUDY INNOVATION

According to the above, it could be viewed that the lesson study innovation was an innovation for professional development which was different from Thai traditional teaching professional development. It was often mostly used in short course training by outsider lecturers. For the lesson study innovation in long course training and implemented by teachers themselves, was the unfamiliar teaching professional development. As a result, teachers had to change their working culture, attitude, many kinds of belief. Therefore, many factors were required in bringing the lesson study innovation in school in order to be success.

Narumul Inprasitha (2009) stated that the success of lesson study innovation referred to the innovation that could be functioned in school until leading to changes in teachers and students. When the organization used this innovation, the following factors should be considered:

(1) The support from control unit of school.

A factor that would support this innovation to be successful, was the work unit in higher level of school, including the Office of Educational Service Area, the Office of Primary Education Commission, as well as the Ministry of Education, should provide support in different aspects: the support for approach that this innovation was valuable, supporting by sending the experts in knowledge management to provide suggestions and support for working morale.

(2) The school administrator’s support

The lesson study innovation couldn’t be able to access the school unless the administrator’s support which could be performed by helping for setting up the lesson study group, scheduling time for teachers to collaborate in developing the lesson study and reflecting, scheduling time table for teachers so that they would have their time in observing the other teacher’s teaching, supporting for the media and tools of knowledge management, and encouraging their morale in participating different activities.

(3) The collaboration with outsider experts

The outsider experts referred to the scholars from the Office of Educational Service Area, instructor or researcher from university supporting for knowledge management which was very important in session the teacher starting to lesson study process. If there was no this factor, the teachers would not able to change themselves.

(4) The awareness of changes in students and teachers themselves

After the teachers used lesson study innovation for a period of time, they were aware that this innovation could help them to change, and there was the effect of teachers’ changes on students’ changes. So, they recognized the worth of innovation. They were confident in the innovation and continued participating in lesson study.

(5) The confidence that the lesson study was an opportunity of professional Development

The teachers who wanted their own professional development for promotion, and viewed this innovation as a guideline for helping them in obtaining guideline for conducting their dossier for promotion in which it would encourage them to be willing to participate in activity of lesson study process.

(6) The experience of working together of teachers participating in lesson study Process

The teachers’ experience on participating in activity of lesson study innovation, whether it was the creation of knowledge management, application of planning and classroom observation, as well as

reflection. In working together, it would help teachers obtaining experience and viewing the value of experience occurring from lesson study innovation. As a result, teachers participated in lesson stud process, and supported this innovation to be existed in school successfully.

(7) The guidelines of knowledge management

The guideline of knowledge management was an important helping the teachers to have same destination in creating the knowledge management plan, classroom observation, and classroom reflection. Furthermore, the teachers were facilitated in obtaining viewpoints of discussion during session in developing the knowledge management plan as well as classroom reflection. Consequently, the teachers recognized that knowledge management plan caused the students’ changes in which it could lead to the teachers’ viewed that the lesson study innovation was valuable and finally existed in school successfully.

## 7 CONCLUSIONS

The lesson study innovation was a technique in teaching professional development being recognized that it could cause the teachers’ various changes especially in teaching. However, this innovation was complex since it included Socio-cultural contexts because it was from Japan as its owner for more than one hundred years until it was normal cultural working. Since schools in Thailand had very much different contexts socio-cultural contexts from Japanese contexts, would use this innovation. Therefore, it needed to be based on collaboration of every one in organization for modifying one’s cultural organization, thinking, belief, attitude in order to support this innovation for being existed in organization successfully.

## 8 ACKNOWLEDGEMENTS

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## Lesson Study: An Implemented Innovation in the Thai Context

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**Abstract:** Lesson Study, a Japanese way of professional development of teachers, has been developed dated back for nearly 140 years. In Thailand, it has been implementing Lesson Study since 2000 and has a unique way of adapting this Japanese professional development. Our experience on Lesson study has been sharing in APEC member economies during the last 6 years and has been said "quite success" in improvement of teaching and learning mathematics. In this paper, key concepts for implementing the lesson study such as "adaptive innovation", "Unit of analysis for making lesson study cycle" "how to determine lesson study team" Or, why "cutting "revision step" from the weekly/ cycle will be discussed. Then, the growth of Lesson Study in Thailand which almost all of them were implemented by Center for Research in Mathematics Education, Faculty of Education, Khon Kaen University will be stated. At last, factors affecting success in applying the Lesson Study in developing the teaching professional development included : the support by original affiliation of school, school administrators' support, collaboration with outside experts, awareness of changes in students as well as teacher, confidence in Lesson Study as an opportunity of professional development, teachers' experience in collaborative working of teachers participating in Lesson Study Process, and knowledge management approach will be discussed.

**Keywords:** Lesson Study, Implemented Innovation, Thai context

### 1 INTRODUCTION

Lesson Study is an innovation as a major method in professional development in Japan. It occurred more than one hundred years ago. It was accepted throughout the time as a technique leading to the better and sustainable teaching (Lewis and Berry, 2006). In addition, it was a guideline of Teacher-led instructional improvement. The teacher was a motivator in teaching improvement by themselves without waiting from the expert outsider experts. For major objective, it was the Student-focused. Therefore, this guideline was very useful for the teacher's instruction whether in content, teaching technique, or student's learning (Lewis, 2002; Lewis and Berry, 2006; Shimizu, 2006; Isoda, 2006; Wang, 2006).

The Lesson Study Innovation was dissemination from Japan to schools in the United States of America as the first country in 1999. It was rapid growth until now. In 2007, there were 13 countries in Asia Pacific Cooperation adopted the teaching professional development in their own countries. For Thailand, the guideline of Lesson Study was administered in the development since 2002 initiated by Maitree Inprasitha (2003) by piloting the teacher training project of Faculty of Education, Khon Kaen University, until 2009, there were 24 schools used the Lesson Study and Open Approach in teaching professional development .

Since the Lesson Study Innovation was accepted in many countries in that it was valuable for teachers because it could make change in teachers and

students. As a result, it was considered to be very appropriate with Thailand because in recent situation the teacher needed to improve their own teaching in order to affect the students' learning reform. Consequently, the application of Lesson Study in teaching professional development of Thailand, would be useful for teacher reform.

### 2 DEFINITION OF LESSON STUDY

The word "Lesson Study" was defined by Center for Research in Mathematics Education, Khon Kaen University, in order to replace an English Term "Lesson Study," by replacing the word "jogyokenkyu," in Japanese Language. For the word "jogyokenkyu," consisted of 2 words "jogyo" meant the classroom, and "kenkyu," which referred to study or conducting research (Yoshida, 2004). According to the letter, therefore, lesson study referred to "the study" or "classroom research". But, the meaning based on real Japanese Culture, when teachers wanted to use lesson study innovation, they would participate in well-developed process including: discussion of Lessons which they already planned and observed teaching together, called "kenkyujogyo" reversing the word "jogyokenkyu." It could be translated that "study or research the lesson" Specifically, in Japanese meaning "lesson" had specific meaning as "The object of one's study." The lesson study or classroom study referred to the "study," according to step of implementation in attempting to accomplish the research objective

chosen to work together by every teacher (such as to comprehend how to do for enhancing the students in being able to learn freely).

### **3 HISTORICAL BACKGROUND OF LESSON STUDY IN THAILAND**

Maitree Inprasitha (2006) stated the background of lesson study in Thailand concluding that the historical background of lesson study in Thailand starting at Faculty of Education, Khon Kaen University, its development was aligned with development of Open Approach. Assistant Professor Dr. Maitree Inprasitha administered the process of lesson study in the project enhancing self-studying with research grant from Khon Kaen University in 2002. The objective of that project was to study the changes in worldview of 15 internship students in Mathematics Education, Faculty of Education, Khon Kaen University, participated in the project. The students taught by the internship group throughout the first semester of 2002 school year, were surveyed their opinion.

In the same year, Maitree Inprasitha (2006) implemented the research project titled “Learning Reform in Mathematics in Schools by focusing on Mathematical Process,” supported by the Office of National Research Commission. In the project, 2 schools participated in: Secondary School --- Kokesee-pittayasan School, and Primary School—Suansanook Municipal, Muang District, Khon Kaen Province.

Later on, in 2003, after the establishment of Center for Research in Mathematics Education: CRME, the development and advertisement in lesson study was responsible by the center. In that year, Faculty of Education, by collaboration between Center for Research in Mathematics Education, and PLAN Organization of Thailand, launched the project “Development of Learning Plan based on guideline of National Educational Reform Act 2001 in each major learning substance by Lesson Study,” aiming for development of in-service teachers in the Office of Khon Kaen Educational Service Area 5, Mathematics Education Learning Substance, and Social Studies, Religion, and Culture Learning Substance, 50 teachers each learning substance, so that they could be able to develop the lesson plan and use in their own class.

In 2006, Faculty of Education, Khon Kaen University, on behalf of the former Dean (Associate Professor Dr. Suladda Loipha ) allowed the Center for Teaching Professional Development and Educational Personnel to collaborate with PLAN Organization of Thailand, implemented the project for developing in-service teachers in the Office of Mahasarakam Educational Service Area 1, and 2, in Mathematics, Science, Thai Language, and Social Studies, Religion, and Culture Learning Substances, by using model of lesson study the same as in 2003.

In the same year, the Center for Research in Mathematics Education, participated in pilot project of pilot school for growing wisdom as a joint project of the Office of Primary School, and the Office of Administration and Development of Body of Knowledge for school reform of the whole system by focusing on teachers for 2 pilot schools including: Chumchonbanchonnabot School, Chonabot District, and Koo-kam-piattayasan School, Samsung District, Khon Kaen Province. The duration of project implementation was 3 years (2006-2008). For the first year, development of open knowledge management plan in Mathematics was emphasized. The teachers and researchers from Center for Mathematics Education, school coordinators, and Master Degree Students participating in research by using both schools as a basis for research collaborating in creating the lesson plan very Sunday. Then, the school coordinators, researchers from Center for Research in Mathematics Education, and Master Degree Students participating in research, 5 persons each school, observed classroom every period. The reflection was performed every Wednesday for Chumchonbanchonnabot School, and every Thursday for Koo-kam-pittayasan School.

The lesson study became to be better known in Thailand when the Center for Research in Mathematics Education, Khon Kaen University, was assigned from APEC to collaborate with Japan in organizing seminar titled “Collaborative Study on Innovation for Teaching and Learning Mathematics in Different Cultures among the APEC Member Economies, 3 times continuously 3 years. For the first one, implemented during 14-17<sup>th</sup> June 2006. For the third one, it was held during 25-29<sup>th</sup> August 2008 at Khon Kaen Province. There were different countries both of APEC members and Non APEC members, total of 18 countries including: China, Chile, Hong Kong, Indonesia, Japan, Korea, Malaysia, Philippines, Singapore, Thailand, the United States of America, Brunai-karus-salam, Australia, Africa, Kambodia, Lao, England, and Vietnam.

In 2009, the Center for Research in Mathematics Education, Faculty of Education, Khon Kaen University, was appointed by the Office of Higher Education Commission, collaborated with the Office of Primary Education Commission, extended the findings from application of lesson study based on network development with higher education institutes in the area including: Chiangmai University and Ubonrachatani University by performing in 12 provinces from North Region and Northeast Region in 19 schools.

In 2011, The Center for Research in Mathematics Education allocated budget to support implementation of teaching professional development, and extended from 4 schools to 22 schools in the North Eastern Region, and 2 schools in North Region.

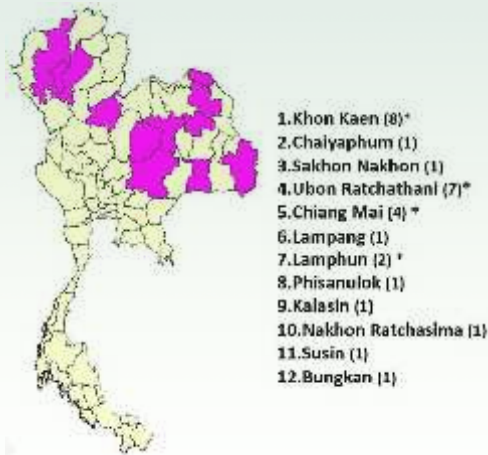


Figure 1. Innovation usage for schools in 2011

In 2013, Faculty of Education, Khon Kaen University agreed to be consultant for teacher development based on guidelines called Browser in Service by using process in developing the Coaching and mentoring through the innovation of Lesson Study, and Open Approach for the Office of Primary Educational Service Area, and the Office of Secondary Educational Service area, for 5 Educational Service Areas in the North Eastern Region as well as North Region, for 25 schools.

The outcome of project implementation being able to develop the Mathematics Classroom supporting the students' Mathematical Higher-order Thinking, caused by cooperation among Khon Kaen University, the work offices being responsible for Educational Policy, and schools as basic sub-units in Educational Reform of Thailand. In addition, for systematic enhancement and development of Mathematics Teaching Profession at Khon Kaen University, the institutions would be set up for international collaboration in order to conduct Research and Development in Mathematics Teaching Profession for the near future, prepared by Khon Kaen University. Moreover, Khon Kaen University tried hard for the Faculty of Education to extend the innovation usage of Lesson Study, and Open Approach to cover 20 provinces, 37 Educational Service Areas, under the name of "The Project for Development of Students' Higher-order Thinking in the North Eastern Region," including total of 50 schools.



Figure 2. Innovation usage for schools in 2014

The implementation under the above project, the Center for Research in Mathematics Education, since the extension of innovation usage for a large number of schools, there were limitations in the staffs to support the school practice. Consequently, the Center for Research in Mathematics Education administered the Coaching Online System by assigning the co-researchers to work at 10 network centers in different provinces. Besides, Coaching Online System was implemented from Faculty of Education, Khon Kaen University into different networks with researchers as key persons in collaboration for writing the Lesson Plan, answering the occurred questions, problems, and obstacles. After collaboration in lesson plan writing, the researcher and co-researcher team followed to various schools in order to collaborate in observing the classroom as well as reflecting the knowledge management based on Lesson Study Process.



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Step 1: The teachers in lesson study group collaborated in developing the knowledge management plan for using in one semester to be completed during the closing of school, which might be 2-3 days. It should be under suggestions of outside experts (the researcher from university or supervisor). For activity in goal setting which was in Step 1 of lesson study process used by Japanese Teachers, it could be modified by the teachers' emphasis on major school goals since it might be too complex activity. In creating the knowledge management plan, the teachers should be made appointment for implementation once a semester by doing in holiday or the end of semester since the teachers might not have time during the semester. The knowledge management plan should be constructed by teachers in lesson study group and outsider experts. The knowledge management plan should be the plan using innovation being congruence with school goals.

Step 2: The teachers in group selecting from their friends in group as the teachers using knowledge management plan whereas the other at least of one person observed classroom and recorded all incidences occurring in class. In classroom observation, the assigned teachers to use the plan, should use it according to guidelines which were agreed. For the observer teachers, they had to observed based on the researchers' guidelines. The most important thing was that: each time in using knowledge management plan, at least one teacher required to observe the class.

Step 3: The classroom reflection, the administrators and every school teacher collaborated in classroom reflect activity which was organized once a week after class in any day. For classroom reflect activity, it should be organized once a week after class in any day scheduled together. The reflecting moderator should be director. This activity required every teacher to participate in reflection. The director had to control reflection to continue following collaborated agreement.

Step 4: The teachers' learning conclusions, performed once a semester after the end of each semester, by teachers.

Step 5: The modification of knowledge management plan, was the adjustment in knowledge management plan and teaching again. It was the activity performing at the end of school year. The teachers used the knowledge management plan they used to administer it last school year, to be discussed in the advantage and disadvantage, and modified it for teaching again in next school year.

For writing report including knowledge management plan, students' information, and reflected that what they had learned. During the first session, it wasn't needed to performed since it might be too much burden for them. But, when school implemented activity in process of lesson study for a period of time, the director should encourage the teachers to write a report since it would be very useful for them because they could reflect their own learning as well as evidence and performance of their work in which they could use as professional utilization in future.

The process of lesson study could be shown by the following chart:

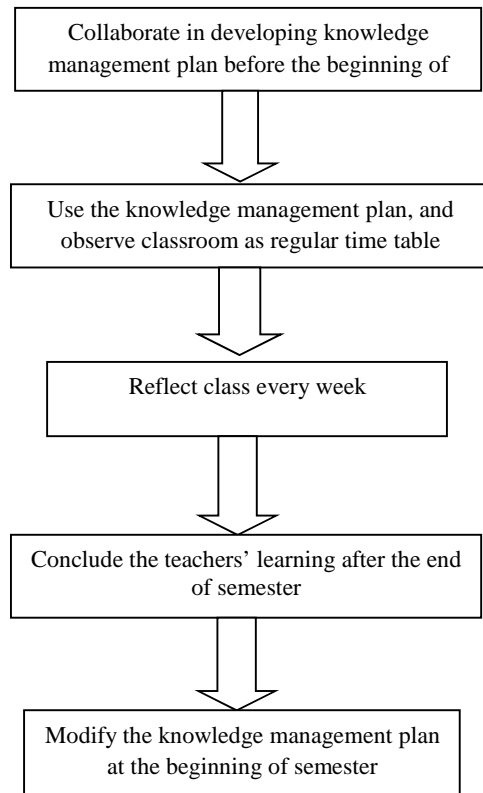


Figure 5. The Lesson Study Process Model

The details of activity in the lesson study process model of this research could be shown in the following table:

Table 1. Activity in the lesson study process model

The administrators and every school teacher	Set the long term goal in developing the students	Beginning of school year	once/school year	Notes
The teachers in lesson study group	Develop the knowledge management plan	During the end of semester, before the beginning of new semester	once/semester	At beginning there should be outsider experts for providing suggestions.
The teachers in lesson study group	Use the knowledge management plan, and observe class	Specified date in time table	3 times a week	
The administrator and every school teacher	Reflect the class	After class	Once a week	
The administrator and every school teacher	Conclude the learning outcome	The end of semester	Once a semester	
Teachers in the lesson study group	Modify the knowledge management plan	During the end of semester, before the beginning of semester	Once at the beginning of school year	Start to perform in the second year

## 6 FACTORS AFFECTING SUCCESS OF LESSON STUDY INNOVATION

According to the above, it could be viewed that the lesson study innovation was an innovation for professional development which was different from Thai traditional teaching professional development. It was often mostly used in short course training by outsider lecturers. For the lesson study innovation in long course training and implemented by teachers themselves, was the unfamiliar teaching professional development. As a result, teachers had to change their working culture, attitude, many kinds of belief. Therefore, many factors were required in bringing the lesson study innovation in school in order to be success.

Narumul Inprasitha (2009) stated that the success of lesson study innovation referred to the innovation that could be functioned in school until leading to changes in teachers and students. When the organization used this innovation, the following factors should be considered:

(1) The support from control unit of school.

A factor that would support this innovation to be successful, was the work unit in higher level of school, including the Office of Educational Service Area, the Office of Primary Education Commission, as well as the Ministry of Education, should provide support in different aspects: the support for approach that this innovation was valuable, supporting by sending the experts in knowledge management to provide suggestions and support for working morale.

(2) The school administrator's support

The lesson study innovation couldn't be able to access the school unless the administrator's support which could be performed by helping for setting up the lesson study group, scheduling time for teachers to collaborate in developing the lesson study and reflecting, scheduling time table for teachers so that they would have their time in observing the other teacher's teaching, supporting for the media and tools of knowledge management, and encouraging their morale in participating different activities.

(3) The collaboration with outsider experts

The outsider experts referred to the scholars from the Office of Educational Service Area, instructor or researcher from university supporting for knowledge management which was very important in session the teacher starting to lesson study process. If there was no this factor, the teachers would not able to change themselves.

(4) The awareness of changes in students and teachers themselves

After the teachers used lesson study innovation for a period of time, they were aware that this innovation could help them to change, and there was the effect of teachers' changes on students' changes. So, they recognized the worth of innovation. They were confident in the innovation and continued participating in lesson study.

(5) The confidence that the lesson study was an opportunity of professional Development

The teachers who wanted their own professional development for promotion, and viewed this innovation as a guideline for helping them in obtaining guideline for conducting their dossier for promotion in which it would encourage them to be willing to participate in activity of lesson study process.

(6) The experience of working together of teachers participating in lesson study Process

The teachers' experience on participating in activity of lesson study innovation, whether it was the creation of knowledge management, application of planning and classroom observation, as well as reflection. In working together, it would help teachers obtaining experience and viewing the value of experience occurring from lesson study innovation. As a result, teachers participated in

lesson stud process, and supported this innovation to be existed in school successfully.

(7) The guidelines of knowledge management

The guideline of knowledge management was an important helping the teachers to have same destination in creating the knowledge management plan, classroom observation, and classroom reflection. Furthermore, the teachers were facilitated in obtaining viewpoints of discussion during session in developing the knowledge management plan as well as classroom reflection. Consequently, the teachers recognized that knowledge management plan caused the students' changes in which it could lead to the teachers' viewed that the lesson study innovation was valuable and finally existed in school successfully.

## 7 CONCLUSIONS

The lesson study innovation was a technique in teaching professional development being recognized that it could cause the teachers' various changes especially in teaching. However, this innovation was complex since it included Socio-cultural contexts because it was from Japan as its owner for more than one hundred years until it was normal cultural working. Since schools in Thailand had very much different contexts socio-cultural contexts from Japanese contexts, would use this innovation. Therefore, it needed to be based on collaboration of every one in organization for modifying one's cultural organization, thinking, belief, attitude in order to support this innovation for being existed in organization successfully.

## 8 ACKNOWLEDGEMENTS

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## The Implementation Lesson Study In Assistance For Primary Teachers On Developing Devices Learning At Elementary School

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**Abstract:** The purpose of this service activities are: 1) To provide assistance for elementary classroom teachers in preparing and developing teaching tools; 2) In order to reflect the experience of learning for elementary classroom teachers through Lesson study. Preparation of training activities for the development of the learning elementary classroom teachers integrate theoretical and practical approach. Theoretical concepts in terms of didactic and methodical in applied learning based on scientific assessments, while the application is done practically in the field. This activity is carried out by using the application of science and technology training methods, based lesson study in order to improve the professionalism of teachers. The interesting thing is encountered when devotion to the activities of the Plan, the majority of teachers had difficulty in defining indicators of learning. They have a perception that for elementary school students learning indicators to formulate enough cognitive level C3 (application). In addition, they argue C1 is cognitive, affective domain C2 and C3 psychomotor. When DO and SEE, we both learned that the division of the group for 1st grade and fourth grade consisting of 6 people / groups were not effective in the implementation of learning. Better for class I SD, maximum 2 persons / groups and for the fourth grade, a maximum of 4 people / group. In designing the study, should be considered a tool / media that is given to each child as a foundation in the mastery of learning materials.

**Keywords:** Lesson study, learning devices, elementary school

### 1 INTRODUCTION

Science and Technology (Science and Technology), both as the substance of the teaching materials and the organization of learning devices, continues to grow. This dynamic requires teachers always improve and adjust its competence in order to be able to develop and present the actual subject matter using a variety of approaches, methods, and the latest learning technology. Only in this way the teacher is able to organize a successful learning lead learners to enter the world of life according to the needs and challenges of his time. Instead, the unwillingness and inability of insight and competence of teachers adjusting to the demands of his profession development environment it will be one of the factors inhibiting the achievement of the objectives of education and learning (Kemdikbud, 2012).

Until now, both in fact and perception, there are many who doubt the competence of teachers in both the subject areas taught and other areas that support

primarily didactic and methodical learning field. This is quite reasonable doubt because it is supported by the results of competency tests that show there are many teachers who have not reached the standard of competence specified. Competency test also shows that there are many teachers who do not master the use of information and communication technology (ICT). Another quite surprising conclusion from the study of which is that the classroom is dominated by a one-way lecture from a teacher and a very rare question and answer. It reflects how many teachers are not trying to improve and update the professionalism (Kemdikbud, 2012).

That fact is also found in a number of primary schools located in the District of East City, as one of the target areas LPM University of Gorontalo. Apparent inability of the teacher looks at the learning device used by teachers in learning activities at school sometimes obtained with a way to copy paste from other schools. Based on observations in the field, can be identified several

problems, among others: 1) The low ability of teachers to formulate indicators of achievement of competencies and learning objectives; 2) The relationship between Standar Kompetensi, Basic Competence and indicators as well as the learning objectives are not synchronized; 3) Not exactly the selection of teaching materials; 4) The form and the scoring system is not appropriate. Most teachers only rate the product but does not implement learning assessment; 5) The utilization of learning resources, especially media that is still low.

The purpose of this service activities are: 1) To provide assistance for elementary classroom teachers in preparing and developing teaching tools; 2) In order to reflect the experience of learning for elementary classroom teachers through Lesson Study

## 2 MATERIALS AND METHODS

To overcome the problems faced by a group of teachers in the district elementary class East Town, then after the Executive Team science and technology program for the community (IbM) conduct a feasibility study, immediately implement alternative problem solving, which is coordinated with the Department of Education and Culture related to training on the preparation and development tools learning for elementary grade teacher at East City District.

The steps of solving the problem is as follows : 1). Survey the existence of Elementary School Teacher; 2) Coordination with Related Agencies (Department of Education, Schools); 3) Determination of Location and Recruiting Teachers who have not been certified preferred; 4). Grouping participants into two major groups, namely: Teachers Class Teacher Class High and Low; 5) Implementation Assistance Preparation Lesson study-based learning tools. To ensure all the stages went well, always balanced with monitoring and evaluation.

Alternatives are taken with consideration of the efficiency and effectiveness of the achievement of the success of this activity. Preparation of training activities for the development of the learning elementary classroom teachers integrate theoretical and practical approach. Theoretical concepts in terms of didactic and methodical in applied learning based on scientific assessments, while the application is done practically in the field. This activity is carried out by using the application of science and technology training methods, based

lesson study in order to improve the professionalism of teachers.

Between the strategic target audiences in these service activities is the Head of Education Office East District of the City and all its officials, Chairman of Force Working Group teachers (KKG) East City District, and the Heads of Primary School located in the district of East Town and the Primary Schools. They have a strategic role to bring together classroom teachers as participants in the mentoring-based lesson study.

Furthermore, who becomes the target audience of this activity is the primary grade teacher who was in the East City District, Gorontalo. Selection of target audience groups based on the consideration that the group grade teacher has a very important role in the school as a learning agent that can be expected to pass on information about the preparation and development of learning tools on other elementary classroom teachers in elementary schools around.

### 2.1 Method of Activity

Community service activities in the group of elementary classroom teachers through mentoring the preparation and development of the learning is done using a method based mentoring lesson study in the East City District, Gorontalo using about 3 months of preparation to the successful implementation of the evaluation phase. The stages of implementation as follows :

1. Conduct a survey to identify the presence of classroom teachers in primary schools in the East City District.
2. To coordinate with branches of the Department of Education and Culture East, to set the location of the implementation of mentoring for elementary classroom teachers in preparing and developing a learning device.
3. Form a group of classroom teachers into High-grade teacher groups are groups of classroom teachers who teach in grades 4, 5, 6 and Low-grade teacher, the group of classroom teachers who teach in class I, II and III.
4. Implementation Assistance. In this activity the group given the knowledge and skills of teachers in the preparation and development of learning tools such as: syllabi, lesson plans, teaching materials, worksheets, and assessment Learning Media Assessment.
5. Evaluate and monitor the effectiveness and efficiency of development assistance activities and the preparation of the learning undertaken

by a group of elementary school classroom teachers in the East City District.

The evaluation was conducted in three phases:

- 1) Initial Activity: to establish a plan of activities to be carried out;
  - 2) during the implementation process: to determine the enforceability of the program and feedback for continued program improvement;
  - 3) The final activity: an evaluation to measure the success of the entire program of activities.
- Evaluation is done by using the assessment instrument of learning, and through participation assessment for mentoring activities take place.

Target outcomes resulting from the Group IbM elementary classroom teacher in the East City District is a learning device in the form of: syllabi, lesson plans, teaching materials, media and valuation assessment.

### 3 RESULTS AND DISCUSSION

Based on data from the Department of Education's Office of Gorontalo in Year 2012, an elementary school in the East City District school amount 17, the amount civil servant teachers 175 teachers and 51 non-civil servant teachers. Furthermore, from the number of teachers who already have a teaching certificate representing 84 civil servant teachers and two non-civil servant teachers.

#### ➤ Realization of resolution

After coordinating with the Department of Education and Chairman of the District of East Town Master Force Working Group (KKG), the executive had engaged in assisting the preparation and development of learning tools for elementary classroom teachers in the East City District, Gorontalo, amounting to 32 people. Classroom teachers representing elementary classroom teachers who teach in the lower grades (grade I, II, and III) and elementary classroom teachers who teach in high-grade (Grade IV, V, and VI). on 19 to 21 November 2012. Activities PLAN that learning occurs in the preparation of SDN 72 East Town on 19 November 2012, while the activity or OPEN CLASS DO and SEE (Reflection) performed at SDN 61 East City on November 21, 2012. For Open Class activities conducted in Class I, II and Thematic learning approach to learning Mathematics Class IV.

#### ➤ Results assisting the preparation and development of learning devices

Mentoring activities for elementary classroom teachers in the East City District, Gorontalo in preparing and developing the learning devices, followed by 32 elementary classroom teachers divided into 4 groups: 2 groups of classroom

teachers representing elementary classroom teachers who teach in the lower grades (grade I, II, and III) and two groups of elementary classroom teachers who teach in high-grade (grade IV, V, and VI).

This mentoring activity-based lesson study. PLAN activity is the preparation of the learning has been done in SDN 72 East Town on 19 November 2012 for together, then the teacher is given the task to develop the learning of each school according to the conditions. Activities or OPEN CLASS DO and SEE (Reflection) performed at SDN 61 East City on November 21, 2012. For activities carried out in the Open Class Class I, II and Thematic learning approach to learning Mathematics Class IV.

The interesting thing encountered when Plan activities, the majority of teachers had difficulty in defining indicators of learning. They have a perception that for elementary school students learning enough to formulate indicators C3 (application). In addition, they argue C1 is cognitive, affective domain C2 and C3 psychomotor. Misperception has been given an explanation when drafting the plan learning activities.

When the DO or the implementation of learning activities in the form of an open class, the teacher acts as a one person model teacher, while the other teachers to act as an observer or observers in learning. The observer in charge of observing the students in learning activities, for example, when students begin to concentrate on learning. Based on observations during the open class in the first grade elementary school, students begin learning concentration turns when teachers invite children - children singing song "Wake up", The number of students who began to concentrate learn to sing ranges characterized by 73%, then the concentration of studied children children decreased again.

Then the students begin to concentrate more when teachers share media hours getting to know the time, every child receives one (1) hour media. Each child tries to shift the existing clock, time toward 7 o'clock and 9 o'clock as instructed teachers. When these activities there are some children who are just quiet and there are also children who have been doing other things because the teacher is given the task has finished working on. From the results of this learning activity, we learned that although the model of applied learning teacher is cooperative learning, and students sit in groups (6 persons / group) but did not appear to group activities. That there is an individual in a group activity. So that children who have completed the task set by the teacher, seemed silent or even do something else.

Furthermore, when the open class in a Class IV B, Mathematics, with material Integer, sort the



numbers from the smallest to the largest of the five numbers hundreds of thousands. The teacher divides the worksheets that contain numbers - numbers written on paper and put in an envelope. Fourth grade students numbered 42 people divided into seven groups, each group consisted of 6 people. When active learning students seem to learn, but there are also students who sit at the edge does not seem to learn. Then the students sitting position in which the student group of men placed on equal footing, it seems the tendency to fight and not to learn.

Furthermore, when the SEE or reflection, the teachers were asked to reflect back on the lessons he has done. The teachers have the courage to express models of learning experience that is done, have the courage to express limitations and dare to open ourselves to make improvements in the future. It is very important for a teacher in an effort to improve the quality of learning. As teachers learning agent should always be willing to continuously learn. From the development assistance activities of this study, we can learn from the open class and reflection activities that have been carried out which of the open class in the first grade elementary school, we can learn the importance of designing the foundation should be given to students and groups of students in the division.

In the opinion of KITADA, Yoshiko (2014) in collaborative learning, the teacher should provide the foundation for every student. The foundation can be a tool / media / about a higher level. For any student who has completed can continue to improve their ability to learn. Furthermore, when viewed from the division of the group, it turns out to children in 1st grade, the number of members of a group of 6 people / groups is too large. Children have difficulties in communicating. Should break out groups for children - children grade 1 is 2 persons / groups.

Furthermore, in the opinion of Masaaki SATO (2014), should be sharing in the learning group had only a maximum of 4 people. The reason why the distribution of the collaborative learning group that only a maximum of 4 people, with the seating position of men and women in a diagonal position and not parallel. This is because girls are usually faster growing and more 'care' than boys. When girls and boys are on the same level, there is a tendency to do other things (play). Furthermore, if the group consists of 6 members, then the child is sitting on the edge position, it would be difficult to communicate with friends in the group.

#### 4 CONCLUSION

From the community service activities such as mentoring preparation and development tools based learning lesson study can be summarized as follows:

- Elementary grade teacher at East City District enlightened and information in the preparation and development of learning devices.
- Elementary classroom teachers get the experience with the reflective learning through Lesson study.
- On the learning class 1 and class IV, the small groups consisting of 6 people / groups, it was not effective.

#### 5 SUGGESTION

From the community service activities are suggested things - the following:

- Activity is expected to remain lesson study carried out to improve relations collegiality among educators in an effort to improve the quality of learning.
- A paradigm shift in the center the learning from teacher to student center, the teacher needs to be assisted in the preparation and development of the learning devices.
- Reflection for us as the college that produces teachers, in order to give the students experience in developing the learning.
- The division of a group of students of class I and class IV should not be too large, For 1st grade students, should be members of the 1 group of a maximum of 2 people, while for the fourth grade students should be 4 people (2 sons, 2 daughters).

#### 6 ACKNOWLEDGEMENTS

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## Locating Opportunities For Learning To Teach In Lesson Study

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**Abstract:** A review of the literature speaks of teacher learning located in lesson study as inherently messy, and complex. What, and how beginning teachers learn amid the challenges in the context of lesson study is hardly explored. Exploring the ways in which teachers participate in the lesson study team can contribute to the understanding, and knowledge building of the conception of learning to teach in community. This paper describes a study that has explored the experiences of beginning teachers as they participated in the lesson study cycle with their relatively more experienced colleagues. The study investigated the opportunities for developing their understanding of knowledge, practices, and student learning through the analysis of teacher talk in the lesson study discussions. The significance of the study lies in its contribution to the theoretical construct of teacher learning in situ. The empirical design of the study took the form of a qualitative case study involving two lesson study teams in two Singapore primary schools. The qualitative case study which employed participant observations, and interviews addressed how teachers talked about subject matter, teaching, and student learning, and what teacher talk revealed about the challenges, and opportunities for learning to teach in lesson study. The research methodology will first be presented followed by the findings of the study, and their wider implications for teacher induction, and mentoring.

**Keywords:** lesson study, learning to teach, English language education

### 1 INTRODUCTION

In recent years, the systemic provision of white-space for professional development within the teachers' school time-table has led to the formation of professional learning communities (PLCs) in Singapore schools. The shift in the current thinking about teacher professional development away from the transmission mode of one-shot training workshops could account for “a surge of interest from school leaders in exploring Lesson Study as a school-based form of professional learning and curriculum development for teachers” (Fang, Lee, & Haron, 2009, p. 1)

### 2 LITERATURE REVIEW

Most of the reviewed studies on teacher learning in lesson study have largely focused on exploring the conditions that support teacher collaboration, and learning (e.g. Chong & Kong, 2012; West-Olatunji, Behar-Horenstein, & Rant, 2008). A number of these reviewed studies adopted the situated learning theoretical perspective in understanding teacher learning in lesson study (e.g. Liberman, 2009; Parks, 2008; Pella, 2011). A few studies have however found how tightly teacher productive, and unproductive thinking are coupled, alluding to the “messy” field of learning in community (e.g. Adamson & Walker, 2011; Parks, 2008).

Teacher conversations in the lesson study teams have mostly been treated descriptively rather than analytically as a mediation tool to sieve out the “subtle nuances in interactions” (Erickson, 1992, p. 204), except for the study by Dudley (2013) which analysed the functions of interaction discourse to understand the mediation of language-in-use. So far, no studies have considered teacher discourse from the angle of positionality as the active agency of individual teachers in co-constructing knowledge was underplayed in foregrounding the exploration of the role of the community of practice, and “onto the intricate structuring of a community's learning resources (Lave & Wenger, 1991, p. 94). Some studies have reported findings on intertextuality as to how are what others have said being referred to, such as in “folding back” to collect ideas, and reconstruct subject matter knowledge (SMK) (Cavey & Berenson, 2005), and “inter-contextuality” as synthesizing prior, and shared knowledge from multiple classroom contexts (Pella, 2011). These findings inform the understanding of mediation of talk for teacher learning.

The implications for future research in teacher learning in lesson study are clear. Firstly, the exploration of the opportunities for learning to teach in lesson study cannot be divorced from the understanding of the participation structures with which teachers interact. Secondly, a fine-grained analysis of teacher conversations is productive in understanding the mediation of talk in teacher learning.

### 3 METHODOLOGY

Bearing the perspective of the significance of talk to teacher learning, a qualitative research which directed a preference for the case study research design, and participant observations, and in-depth interviews for the research methods was undertaken.

#### 3.1 Scope of the study

A single-case design involving two school sites was utilised. The two schools selected were Ningxia Primary School (pseudonyms), a “popular” primary school, and New Vision Primary School, a “neighbourhood” (pseudonyms) primary school. The New Vision team was a diverse group across gender, and race which was reflective of the multi-racial society in Singapore while the Ningxia team consisted of all female Chinese teachers. Both teams comprised 11 teachers with 3 beginning teachers (BTs) led by the Level Master, and a knowledgeable other who was either the School Staff Developer (SSD) or the Subject Head (SH). BTs were defined as teachers who have less than 2 years of teaching experience. The team worked with 7 year olds pupils focusing on English language teaching at the Primary 1 level.

In New Vision, the Research Teachers (RTs) were selected by the drawing of lots to ensure fairness, and equity since all members would have an equal chance of being picked as the RT. In the end, the RTs who were selected were two experienced teachers with at least eight years of teaching experience. In Ningxia, the three BTs were selected as RTs based on the team’s understanding that teaching the research lessons (RL) would help them in their learning to teach.

#### 3.2 Data analysis

To analyse the participation structures of the teachers in terms of the patterns of topic initiation, and floor taking turns, each transcript from the participant observation of the team meetings was segmented into meaningful units of analysis or idea units. Topic initiators were identified, and grouped to understand how the role assignment influenced knowledge initiation. As far as possible, each topic issue was labelled in vivo using the participants’ words, and coded a priori based on whether they referred to subject matter knowledge (SUB), teaching pedagogy (TEA), or student learning (STU), to direct at the first research question. The topic initiators were grouped as: (1) BTs; (2) RTs; (3) facilitators comprising the Level Master (LM), School Staff Developer (SSD), Subject Head (SH), and Senior Teacher (ST), and the researcher (R); and (4) other experienced teachers to

compare the differences in the patterns of knowledge initiation.

To analyse teacher talk, an ethnographic perspective on discourse analysis was taken through the exploration of “part-whole, whole-part relationships and the use of contrastive relevance” (Gee & Green, 1998, p. 127) within, and across cycles, and across sites using a constant comparison analysis (Glaser, 1965). It differed from the traditional linguistic discourse analysis in being less focused on the language itself, and more focussed on its interaction functions for the joint activity of knowledge construction (Mercer, 2007, p. 141), and grounded in the sociocultural perspective of learning.

### 4 FINDINGS

The findings from the analysis of the participation structures would be presented to provide perspectives from quantified data to address the first research question: How do teachers talk about subject matter, teaching, and student learning. This would be followed by a discussion of the findings from the analysis of interaction discourse to address the second research question: What does teacher talk reveal about the challenges, and opportunities for beginning teachers in learning to teach in such practice-based contexts.

To provide readers a sense of the trajectory of the topic shifts in the lesson study discussion, the topic issues in New Vision Cycle 1, and their topic initiators are shown in Table 1. Planning discussion 1 started off with a focus on student learning difficulty, and ended with a decision to collect evidence of children who “can’t actually write” using the “character study” task. Planning discussion 2 started with a sharing of the findings from the students’ responses on that pre-lesson task. During Planning discussion 3 in which the RT 2 walked the team through the unit plan that had been worked on, the majority of the topic issues raised (8 topics: 80%) were related to teaching for the upcoming research lesson. During the post-lesson meeting, the focus on student learning was taken up again by the Level Master situating the discussion on the observations of students’ learning.

Table 1. Topic Issues, and Topic Initiators in New Vision Lesson Study Cycle 1

Session	Segment	Topic issue	Code	Initiator
Planning discussion 1	1	“What topic/skill do students have difficulty learning?”	STU	LM
	2	“new reading programme”	SUB	ST
	3	“What is the overarching thing we want to do?”	TEA	SSD
	4	Working with “the end in mind”	TEA	LM
	5	“value in giving them the character study task”	STU	Researcher
Planning discussion 2	1	“explore, and analyse the pretest”	STU	LM
	2	Identifying lesson focus	SUB	RT 2
	3	Deciding on stellar book, and resources	TEA	Researcher
	4	“who is willing to be the research teacher?”	TEA	RT 2
Planning discussion 3	1	Sharing on the teaching of recounts	TEA	BT 2
	2	Presenting the flow of lesson unit	TEA	RT 2
	3	“make use of other lessons”	STU	ST
	4	Checking on focus: adjectives on feelings words?	SUB	Others
	5	Not reinventing the wheel	TEA	RT 1
	6	Locating lesson observation in the lesson unit	TEA	LM
	7	“consider the live resource room”	TEA	SSD
	8	“move on” with lesson planning	TEA	RT 2
	9	“show the pictures” of live resource room	TEA	SSD
	10	“come back to where we discuss”: scaffolding	TEA	LM
Post-lesson discussion	1	“research teacher usually start off first”	STU	LM
	2	RT's reflections	STU	RT 1
	3	Other teachers' reflections	STU	Others
	4	“relook at the worksheets”	TEA	ST
	5	“flexibility to change the lesson, and questioning”	TEA	LM

#### 4.1 Distribution of topic issues

The distribution of topic issues along the planning, and reflecting activities over the two lesson study cycles in New Vision is shown in Table 2 below. It appeared that the mediating activity of lesson planning engendered more topic issues on the teaching pedagogy (41 topics: 55.4%) than on student learning (11 topics: 14.9%), and subject matter (4 topics: 5.4%). Leveraging the “new reading programme” within the national mandated English curriculum for the lesson study inquiry could have shaped the teachers’ taken-for-granted assumptions that the subject content has been dealt with, leading to fewer topic shifts on subject matter initially in Cycle 1 (3 topics: 4.1%) but more topics in Cycle 2 (8 topics: 10.8%) when teachers began to raise questions on their understanding of adjectives

used to describe a character in the story. Focusing the post-lesson discussions on observed student learning during the research lessons engendered more topic issues related to student thinking, and actions (9 topics: 12.2%) than on what had worked well, and what did not work as well (7 topics: 9.5%).

#### 4.2 Knowledge initiation patterns

To understand the mediation of the topic initiators, and their knowledge initiation, the idea of topic floor holding time was used. The time each topic issue initiated took centre stage, and was sustained in the discussion before the next topic shift was noted. The distribution of the topic floor holding time in the New Vision team is shown in Table 3.

Table 2. Distribution of Topic Issues in New Vision Team

Activities	Subject matter		Teaching		Student learning		Total	
Planning	4	5.4%	41	55.4%	11	14.9%	56	75.7%
Reflecting	2	2.7%	7	9.5%	9	12.2%	18	24.3%
Total	6	8.1%	48	64.9%	20	27.0%	74	100%

Table 3. Topic Floor Holding Time (in minutes) in New Vision Team

Initiated by	Subject matter		Teaching		Student learning		Total	
	Minutes	Percentage	Minutes	Percentage	Minutes	Percentage	Minutes	Percentage
BTs	0	0%	12	2.5%	3	0.6%	15	3.1%
RTs	15	3.1%	85	17.5%	7	1.4%	107	22.0%
Facilitators	37	7.6%	161	33.1%	99	20.3%	297	61.0%
Others	15	3.1%	28	5.7%	25	5.1%	68	14.0%
Total	67	13.8%	286	58.7%	134	27.5%	487	100%

Over two lesson study cycles, the teachers spent more than half the time talking about topics related to teaching pedagogy (286 minutes: 58.7%), the bulk of which were initiated by the facilitators (161 minutes: 33.1%), followed by RTs (85 minutes: 17.5%). It appeared that the role assignment as RTs shaped the two teachers’ knowledge initiation patterns, accounting for a total of 22% of talk (107 minutes) centred on topics initiated by them. During the planning discussion 4 where RT2 was not around, and the post-lesson discussion 3 when both RTs were not around, the experienced teachers in the team stepped up to contribute more, accounting for a major part of the 14% of talk (68 minutes) in which they were the knowledge initiators. Of the topic shifts initiated by BTs, they were most concerned with teaching which accounted for 12 minutes of sustained conversation (2.5%).

### 4.3 Changes in participation patterns

To understand how participation patterns changed over the course of the lesson study cycles, the number of times the teachers took turns to speak during the discussions were aggregated. Special attention was paid to the floor turn taking patterns of BTs to compare the changes in their participation across cycles, and across the two sites to understand the playing out of “legitimate peripheral participation” in this context. Table 4 below shows the distribution of floor turn taking amongst the teachers in New Vision.

Generally, the New Vision teachers took more turns across all groups to contribute to conversations

related to teaching pedagogy in Cycle 2 as compared to Cycle 1 (221 more speech turns: 53.3% more). Though the overall number of times BTs spoke decreased (3 less speech turns: 5.6% less), they participated more in conversations related to teaching pedagogy (10 more speech turns: 37.0% more). The number of floor turn taking by the other experienced teachers rose across all topic categories, reflecting their increasingly more central participation in the New Vision lesson study team.

### 4.4 Role mediation

The percentage distribution of floor turn taking in the New Vision team, and Ningxia team is shown in Table 5 to compare the differences in their speech turns shaped by role mediation. In general, the distribution of speech turns across subject matter, teaching, and student learning was similar, with both teams utilizing more than two-thirds of the speech turns talking about teaching related topic issues.

By virtue of their role assignment as RTs, the BTs in Ningxia had more opportunities to talk, which accounted for 15.6% of the floor taking turns in their team as compared to the BTs in New Vision (7.0%). Bearing the perspective of the teacher learning as learning to talk about work practice, rather than learning from listening to others talk (Lave & Wenger, 1991, p. 109), it appeared that the role mediation as RTs engendered more opportunities for learning across all categories of knowledge domain for the BTs in Ningxia.

Table 0. Floor Taking Turns in New Vision Team

Teachers	Subject matter		Teaching		Student learning		Total	
	Cycle 1	Cycle 2	Cycle 1	Cycle 2	Cycle 1	Cycle 2	Cycle 1	Cycle 2
BTs	6	3	27	37	21	11	54	51
RTs	19	3	142	204	43	17	204	224
Facilitators	62	43	234	305	94	58	390	406
Others	2	26	14	90	20	25	36	141
Total	89	75	417	636	178	111	684	822

Table 5. Floor Taking Turns (in percentage) in New Vision (NV) and Ningxia (NX) Teams

Teachers	Subject matter		Teaching		Student learning		Total	
	NV	NX	NV	NX	NV	NX	NV	NX
BTs	0.6%	1.8%	4.2%	9.4%	2.1%	4.3%	7.0%	15.6%
RTs	1.5%	-	23.0%	-	4.0%	-	28.4%	-
Facilitators	7.0%	4.9%	35.8%	43.6%	10.1%	12.9%	52.9%	61.5%
Others	1.9%	2.5%	6.9%	15.3%	3.0%	5.2%	11.8%	23.0%
Total	10.9%	9.2%	69.9%	68.3%	19.2%	22.4%	100.0%	100.0%

The speech turns by the BTs in Ningxia were however not evenly distributed among the three BTs, with BT 2 playing a more central role, particularly when BT 3 was absent for the lesson planning for the third research lesson. The increased opportunities for talk as RTs were engendered in the planning meetings where they rehearsed what they had planned for the research lesson, and in addressing their concerns, for example, with certain suggestions from the experienced teachers along the way. In the post-lesson discussions, the BTs as the RTs had the prerogative to share their reflections before the rest of the team.

However, these community-mediated actions also allowed the 2 New Vision RTs who were more experienced teachers to dominate 28.4% of the speech turns in the team, shaping the distribution of speech turns of 4 facilitators (52.9%), and the 3 other experienced teachers (11.8%). In comparison, more speech turns were distributed among the 4 facilitators, (61.5%), and 5 other experienced teachers (23.0%) in the Ningxia team, who contributed more in almost all knowledge domains to support the novice teachers in planning the research lessons. Except for topic issues related to subject matter, the New Vision facilitators contributed more speech turns to their team (7.0%) than the Ningxia facilitators (4.9%).

## 5 DISCUSSION

### 5.1 How teachers talked about student learning difficulty

The examination of the teacher conversations in New Vision Planning Discussion 1 revealed a face of teacher practice dealing with the different manifestations of students' learning difficulty. The conversation transcript is shown in Table 6 below. An analysis of the meaning making repertoires teachers drew upon revealed the different ways of knowing student learning difficulty.

From the transcript, it appeared that as the teachers built on one another's contributions, the

discussion became increasingly more about how weak the pupils were. On a closer analysis, the face of teacher practice it offered was a collective image of how the pupils' reading problems occurred at various levels ranging from the most basic level of the decoding of words [39/04] to word-level comprehension [41/07], to sentence-level comprehension [36/01-36/02], and to text-level comprehension as they "cannot link what they are reading to what they are understanding" [39/04-39/05]. When it came to pupils' problems with writing, teacher talk revealed how the pupils' problems operated on two levels: (1) at the micro-level with "simple sentence construction" [41/08] with regard to their challenges with "spelling" [35/02], "vocabulary, grammar" [28/04], and (2) on a more meta-level to "apply what they have learnt from reading to writing" [28/02-28/03]. The teachers drew upon their past observations of students' difficulty with reading "simple instructions" [29/03-29/04], reading of a 50-word list [30/3], and other assessments done so far [41/01]. When talking about student learning difficulty, the BT's did not make such reference to their ways of knowing how pupils "still have problems with application" [28/06], "have difficulty constructing meaning" [35/04], and "can't comprehend what the sentence or question is" [36/01-36/02]. Opportunities for learning to talk about ways of knowing for knowledge building could come about from listening to such talk.

The teacher conversations has revealed a face of teacher practice by concretizing student learning difficulties. The rendering of these true situations in the classroom opened up a pathway to enable the topic of discussion to shift towards exploring the school's newround-robin discussion. By agreeing with Randy [31/01], Sally hedged on her idea unit about children's problems with linking reading to writing [28/01] to gain leverage to talk about the ELdepartment's programme that she was initially scheduled to share on after the discussion on the lesson study focus. She referred to Randy

againsaying, “Like what Randy says, to first of all, show the teachers.” [31/05], although Randy did not

Table 6. Transcript from New Vision 28 Mar TTT: Deciding on Research Focus

Interaction no./line no.	Speaker	Interactions	Discourse analysis
28/01 28/02 28/03 28/04 28/05 28/06 28/07	Randy (BT3)	I think the children are not ready to link reading and writing. If they are able to link reading and writing and apply what they have learnt from reading into their writing, they won't have problems with writing when it comes to vocabulary, grammar and sentence structure. Sometimes when we teach like grammar and sentence structure in context, but they still have problems with application. So, ya /	Hypothesizing
29/01 29/02 29/03 29/04 29/05	Annie	Basically, I think the pupils still have problems reading. So I think because of that, then all the other subjects are affected. You need to know how to read before you can do the questions. But simple instructions they have problems with reading, they have problems in doing the questions.	Ways of knowing
30/01 30/02 30/03	Cathy	I think my class (.) half of them couldn't read. Half of them couldn't write. Those who are better, they really can write in paragraphs. Those who can't, can't even clear through the 50 words.	Ways of knowing
31/01 31/02 31/03 31/04 31/05 31/06 31/07 31/08 31/09 31/10 31/11	Sally (ST)	For me, I agree with Randy. That's why this year I embarked on sharing with the P2 teachers how our reading curriculum can help support our writing. For example, for reading, we teach sequencing of events, character study, settings and over 2 terms and in term 3, it supports the narrative writing. Like what Randy says, to first of all, show the teachers. I'm the ST for English, that's why I come from that point of view. The grammar items that we teach, for example, we covered in the Primary English, time sequence words. So, time sequence words can not only be used in procedural writing but also in recounts. The children must be shown very, very clearly that when you learn this in grammar, you can actually use it in procedural writing. So that explicit teaching must be made.	Intertextuality  Intertextuality Positionality
35/01 35/02 35/03 35/04	Diana (BT1)	50% of the pupils still needs help with reading. Some of them have solid reading skills but the writing is not there yet. Spelling and things like that. When I go through the reading with them per se, they have difficulty constructing meaning. That is my concern right now.	
36/01 36/02	Shawn (BT2)	Same as the rest. The children can read but they can't comprehend what the sentence or questions is.	Positionality
37/01 37/02	Clive (LM)	You mean they don't understand what they are reading per se. They can decode the words but they don't understand.	
38/01	Shawn	Ya. They don't understand the intention of the sentence.	
39/01 39/02 39/03 39/04 39/05 39/06	Isaiah (RT1)	My class, yes, some of them can read very well. The minority, those few, the whole group right can parrot, but they cannot (read). They can parrot you very nicely. But they got no reading skills. They cannot decode and that's where it holds back the whole lot of class. Those in between cannot link what they are reading to what they are understanding (.) so there is a bit of problem.	Categorisation of pupils
40/01 40/02 40/03	Susan	Ok, for my side will be mainly, I am taking the P1 lower ability students. The main concerns would be identifying the words, understanding the words, and committing to memory.	Positionality
41/01 41/02 41/03 41/04 41/05 41/06 41/07 41/08 41/09	Clive	For my class, based on the assessment so far, I have observed that they can decode the words but they don't understand the exactly meaning. Even if they do understand, they don't see it in the context of the writing. How to use it in sentence formation. This is so far because we are going to step into writing. I'm wondering how we are going to bridge this particular gap for them, to first understand the meaning of words they are reading and how to apply the words in simple sentence construction based on the topic we are going to do for Term 2. So in general, one round and it seems that most of us are on English. So is it ok that we focus on English? And now there is 2	Way of knowing



Interaction no./line no.	Speaker	Interactions	Discourse analysis
41/10 41/11		parts right, one of reading and there is writing. How do we actually progress from here?	

not mention this. In this way, Sally positioned herself as the expert but tempered her positioning by first alluding to Randy’s insight on linking reading with writing, and positioning Randy as a voice to support the new EL Department reading programme.

Starting the lesson study with a “*genuine problem*” [New Vision Sep 26: Interview with Clive] as a shared way of engaging in doing things together (Wenger, 1998, p. 125) rendered the ensuing collegial conversation about pupils’ learning difficulties natural, and taken-for-granted by the insiders of the team. To outsiders, it might have appeared as another episode of teachers’ ranting given the pressure to cover the syllabus, and achieve good results. The rendering of this conversation alluded to the lens afforded by pragmatism as an interpretative repertoire through which the teachers made sense of what to foreground in lesson study inquiry.

## 5.2 How teachers talked about teaching

The ways in which the teachers talked about teaching in the context of lesson study were informed by different things. For Sally, it was in “not making the same mistake twice”. In getting the teachers’ buy-in to leverage the reading programme for the lesson study inquiry, she shared how “*talking to the P2 teachers, I realized that some of them just jumped straight to here (individual work), there is a little of this (explicit teaching) for about 10 minutes, this is taken out totally (group work) ... But in doing lesson study, if you are agreeable to this (.) it will definitely improve the pedagogy of the lesson.*” [New Vision Mar 28: Planning discussion 1]

This idea of “trying to improve something that is there already” [New Vision Sep 26: Interview with Isaiah] encapsulated the teachers’ understanding of lesson study inquiry in practice. The mediation of intertextuality as a dominant discourse that teachers drew upon created new images of practice through synthesizing, and making connections, for resource building. The transcript of the third planning meeting is shown in Table 7 to illustrate the meaning-making repertoires that teachers drew upon to inform the design of the research lesson.

From the analysis of the transcript, it revealed how the research lesson was not viewed as “a once-off lesson” [146/01], but as “a package” [144/01] comprising several lessons. To take student learning beyond the research lesson, the teachers considered making use of other lessons such as circle time [09/01-09/02], making use of other resources such as the positive word lists [12/05], and making use of the existing resources in the national mandated curriculum such as the STELLAR guidelines [177/01-177/02]. The teachers engaged in “folding back” (Cavey & Berenson, 2005) to recall their prior experiences, in using some of these resources in their classroom [33/01], and considered how the subject matter knowledge lent itself to the social, and emotional development of the students [33/02].

The name of individuals in the school such as “Christine” was being referred to lend weight to the use of certain resources such as the rainbow names as positive adjectives [31/01-31/02]. Even when the name of the originator eluded, the concept of “colour coding” was referred to in order to build on the ideas that were mentioned in the previous planning discussions.

In the end, the most significant developments in the New Vision case study occurred in two aspects of practice. The first was in the development of a series of vocabulary building pre-lesson tasks to support the character study research lessons. This involved the tool-mediation of the use of the concept map to brainstorm the characteristics of clowns in research lesson one, and the anchor chart to build a list of emotion traits, and personality traits in research lesson two. The second was the development of formative assessment strategies drawing upon the team’s earlier study on TLC FA (Teacher Learning Community: Formative Assessment) to make the learning intentions of the second research lesson, and its success criteria explicit to students.

When the phrase “Don’t reinvent the wheel” is typically used, it reminds one to avoid making any unnecessary preparations or do any work that is deemed redundant, the premise of which is to save time. When asked on her thoughts on the use of the phrase “don’t reinvent the wheel” in the context of this conversation transcript, Diana, the BT, said, “I thought it’s not bad. The fact that they (the pupils) are already exposed to that (FTGP booklet). I think

that was a very interesting idea.” She explained how with the use of rainbow names “linking it back to what they are exposed to really helped in my classroom”. [New Vision, May 20: Interview with Diana].

It appeared that the teachers’ premise of “don’t reinvent the wheel” was not so much just to save

time. The teachers’ understanding was much beyond what seemed to be originally intended with the idiomatic metaphor of “don’t reinvent the wheel”. By examining how it has been deployed, it alluded to the central premise of teacher agency in

Table 7. Transcript from New Vision 11 Apr TTT: Lesson Planning of Research Lesson 1

Interaction no./line no.	Speaker	Interactions	Discourse analysis
9/01 9/02 9/03 9/04 9/05 9/06 9/07 9/08 9/09 9/10 ...	Sally (ST)	Just to explore some ideas: make use of other lessons, for example, circle time in the morning. So after teaching some vocabulary words on adjectives right to describe people, you may want to put some of these words on the board. And then in the morning, you may want to give the children a small slip of paper and tell them to name one person like caring or helpful. Write down the person’s name and then give reasons in a very short sentence, why the person you choose in your class is like this, ok. So every day if you do it, you do it, ok, for that two weeks or three weeks, if you do it consistently every day, the children get to revise the vocabulary, they also get to come out with reasons why. So that actually supports our English lesson.	Make use of other lessons
12/01 12/02 12/03 12/04 12/05 12/06 12/07 ...	San San (RT2)	Thank you very much. And in PAL (Programme for Active Learning) lessons, the objectives that are presented to them at the beginning of the lesson, it really spells out the SEL (social emotional learning) clearly. And if you open your FTGP (Form Teacher Guidance Period) book, there is I think a few pages on positive words. You can use that too. I like that idea. Thank you very much. We can put this together in a package in order to build up you know so that when it comes to here, it is nothing alien to them.	Make use of other resources
13/01 13/02 ...	Randy (BT3)	Based on what Sally just shared, because during my FTGP, Christine actually shared with us on the colourful rainbow.	Intertextuality
15/01 15/02 15/03 ...	Susan	So for classes that actually did that, you may want to tap on the rainbow. For Shawn’s class and a few of us, you may want to tap on that. Some of the positive ways are checking on themselves or by their parents.	Intertextuality
28/01 28/02 28/03 28/04 ...	Isaiah (RT1)	(Referring to the FTGP book) We can use the part with the feeling word bank. Like Sally said, using a note for that. You can use that together to encourage or thank you note. You want to have a blank one. It’s also can. Next, next week. So that’s why I said use the FTGP book. It is very very useful.	Make use of other resources
29/01 30/01 31/01 ...	Sally Isaiah Sally	We don’t have to reinvent the wheel. Don’t need to reinvent the wheel. We use whatever resources we have.	Metaphor
33/01 33/02 33/03	Isaiah	Last year, I also did this. I also put it on the wall. So at least right, their friends also feel good. Like I said, we are doing the SEL part also. And especially when it creates an environment of (.)	Prior experience
62/01 62/02 ...	Ixora (KO)	Based on what you wrote. I just thought of somebody during TTT actually shared on this using colour coding.	Intertextuality
144/01 144/02	Sally	When Isaiah and I were doing it, we were thinking of it as a package as in suggested.	Making use of several lessons
145/01	Clive (LM)	The lesson would not be SBA 1 all the way. We will extend ...	
146/01 ...	Isaiah	It is more like a package than a once-off lesson.	Making use of several lessons

Interaction no./line no.	Speaker	Interactions	Discourse analysis
177/01 177/02 177/03 177/04 177/05	Isaiah	I printed the whole guidelines (STELLAR guidelines: Strategies for English Language Learning and Reading)for you. The one we tap on is from SBA 2 and you can see probably the questions that we were talking about. "Have you ever watched a car racing show on television? How do you feel?" All that. The feelings are all there.	Make use of existing resources

building on the available resources to maximize student learning. In Wenger's (1998) words, even though the lesson study team was shaped by institutional conditions outside the control of the teachers, it is their response to their conditions that will "produce a practice with an inventiveness that is all theirs" (p. 79)as their joint enterprise.

## 6 CONCLUSION

This study of teacher learning situated in teachers' work attempted to bring to bear the inner logic of teachers' pedagogic discourse underlying the transformation of knowledge into the pedagogic communication (Bernstein, 1996) in the planning, and enactment of research lessons. A fine-grained analysis of teacher discourse was deployed to describe in more nuanced ways the interpretive meaning making repertoires teachers drew upon to make sense of problems situated in teacher practice.

The implications for lesson study in engendering learning to teach through opportunities in engaging in teacher talk related to subject matter, teaching, and student learning is considerable. This is particularly when the beginning teacher plays the more central role as the research teacher. As long as there are novice teachers, and teachers who are new to the school or to the grade level participating in the lesson study team, the opportunities for learning to teach through the lesson study practice would be naturally occurring. It is therefore significant to widen the scope of the mentoring of novices to include the conception of learning to teach as mediated by teacher talk in lesson study. The case for locating opportunities for learning to teach in lesson study is much aligned to the decentered apprenticeship view of (Lave & Wenger, 1991) which paid attention to the locus of mentoring not on an individual mentor but "onto the intricate structuring of a community's learning resources (p. 94). This study builds on this theoretical construct of teacher learning by expanding the locus of mentoring to include the active agency of teachers in the community.

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## Konsep ‘PADI’ dalam Penulisan Karangan Naratif

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**Abstrak:** Guru-guru mendapati bahawa para pelajar gemar menjawab soalan karangan berbentuk naratif. Namun, hasil penulisan mereka didapati kurang menarik dan kurang baik dari segi bahasa. Lantaran, bagi mengatasi situasi sebegini, guru-guru bahasa Melayu telah memperkenalkan konsep ‘P.A.D.I’ – akronim untuk **P**erasaan, **A**ksi, **D**ialog dan **I**lham. Pengenalan kepada Konsep P.A.D.I ini juga telah dijadikan sebagai Kajian Pengajaran (*Lesson Study*) pada tahun 2011. Kumpulan sasaran adalah pelajar Menengah 2 Ekspres. Berdasarkan Kajian Pengajaran ini, para pelajar berjaya memahami konsep ‘P.A.D.I’ dan mengaplikasikan konsep ‘PADI’ tersebut dalam penulisan karangan naratif. Pendekatan Kajian Pengajaran atau *Lesson Studies* telah digunakan bagi meneliti keberkesanan pengajaran dan pembelajaran. Dapatan kajian menunjukkan kesan yang menggalakkan bagi pembelajaran pelajar. Karangan naratif yang dihasilkan pelajar didapati lebih menarik dari segi idea dan muta bahasa yang digunakan oleh pelajar bertambah baik dan bermutu. Justeru itu, guru-guru bersetuju bahawa Kajian Pengajaran ini dapat membantu mengurangkan dan seterusnya mengatasi masalah para pelajar.

**Kata Kunci:** Kajian Pengajaran, Penulisan Naratif, Perasaan, Aksi, Dialog, Ilham

### 1 PENGENALAN

Guru-guru mendapati bahawa secara keseluruhan pelajar-pelajar amat cenderung untuk memilih karangan berbentuk naratif kerana menganggap karangan jenis ini lebih mudah jika dibandingkan dengan bentuk karangan ekspositori ataupun deskriptif. Namun begitu, hasil karangan pelajar didapati agak lemah kerana kurang menarik dari segi jalan cerita dan bahasanya. Setelah dikaji, hasil karangan pelajar didapati menggunakan gaya penulisan menceritakan semula, tanpa penggunaan dialog, frasa-frasa berbunga dan pelajar sering menggunakan urutan plot yang kurang menarik.

Bagi menangani situasi sebegini, guru-guru bahasa Melayu telah mengambil inisiatif untuk menjalankan Kajian Pengajaran yang lebih fokus dalam membantu pelajar dari segi penulisan. Guru-guru telah memperkenalkan konsep ‘PADI’ – akronim untuk **P**erasaan, **A**ksi, **D**ialog dan **I**lham. Pengenalan kepada Konsep PADI ini juga telah dijadikan sebagai Kajian Pengajaran (*Lesson Study*) pada tahun 2011.

Dengan memperkenalkan konsep ‘PADI’, guru berharap dapat membantu pelajar menulis karangan dengan lebih baik dan menarik dari segi idea dan bahasa. Pemberatan markah untuk Kertas 1 terutama sekali Bahagian B (Karangan) adalah besar dan penting. Bahagian ini pasti menjejaskan keputusan peperiksaan pelajar-pelajar secara keseluruhan. Oleh sebab itu guru memilih tajuk tersebut dengan harapan dapat membantu pelajar mempertingkatkan keupayaan mereka menulis dan seterusnya meraih keputusan keseluruhan peperiksaan yang lebih baik dalam subjek Bahasa Melayu.

### 2 PERNYATAAN MASALAH

Kebanyakan pelajar didapati gemar memilih untuk menjawab soalan karangan naratif, tetapi hasil karangan yang mereka tulis kurang baik dan tidak menarik. Komponen menulis karangan merupakan komponen yang penting dalam peperiksaan dan pemarkahan. Markah yang diperoleh boleh membantu pelajar meraih markah yang cemerlang dalam subjek tersebut. Oleh itu, kumpulan kajian pengajaran ini telah memilih untuk menumpukan perhatian kepada aktiviti bahagian mengarang sebagai bahan kajian.

Guru memilih untuk memperkenalkan konsep ‘PADI’ sebagai aktiviti utama supaya pelajar mendapat pendedahan kepada cara pembelajaran menulis karangan naratif yang lebih baik dan berstruktur. Dengan mengenalkan konsep PADI ini diharapkan dapat membantu pelajar menggunakan konsep yang telah dipelajari secara sedar ketika mengarang dan menulis karangan jenis naratif.

Sebelum pendekatan kajian pengajaran dijalankan oleh kumpulan guru, keputusan peperiksaan pelajar pada tahun 2010 telah dianalisis. Penelitian tersebut menunjukkan bahawa pelajar tidak mempunyai masalah untuk lulus dalam subjek bahasa Melayu. Namun begitu, dari segi peraturan pelajar yang mendapat keputusan cemerlang bagi subjek bahasa Melayu tidak menggalakkan. Guru juga meneliti hasil karangan pelajar dan mendapati karangan pelajar hanya berbentuk menceritakan semula, tanpa penggunaan dialog atau frasa-frasa berbunga yang berkesan serta mengandungi pembinaan unsur plot yang kurang menarik. Oleh itu, guru mengambil inisiatif untuk mengatasi masalah ini dengan menjalankan kajian pengajaran.

Oleh yang demikian, guru telah mengambil inisiatif untuk membantu meningkatkan pencapaian pelajar dengan melibatkan diri dalam kajian kajian pengajaran. Setelah meneliti dan mengikuti beberapa perkongsian di Seminar Bahasa Melayu anjuran Pusat Bahasa Melayu Singapura dan berbincang dengan Guru Pakar, kumpulan kajian pengajaran melaksanakan pendekatan kajian pengajaran menggunakan konsep PADI untuk membantu pelajar meningkatkan pencapaian mereka dari segi penulisan.

### 3 MATLAMAT KAJIAN

Tujuan kajian ini dilakukan adalah untuk:

1. meneliti keberkesanan penggunaan konsep PADI dalam penulisan naratif pelajar
2. meneliti keberkesanan penggunaan konsep PADI dalam meningkatkan mutu bahasa dan jalan cerita dalam penulisan pelajar.

### 4 KAJIAN LITERATUR

Terdapat banyak kajian yang telah dijalankan mengenai penggunaan pendekatan Kajian Pengajaran dan keberkesannya. Darling-Hammond & McLaughlin (1995) menyatakan kajian penyelidikan digunakan untuk berkongsi pandangan terhadap perkembangan profesional guru yang efektif dan berkesan.

Rahayu (2005), pula berpendapat bahawa Kajian Pengajaran dilakukan di dalam kelas dengan tujuan untuk memahami pelajar dengan lebih baik dan dilakukan secara bersama-sama dengan guru lain. Ini juga merupakan tujuan mengapa kajian pengajaran dilaksanakan di sekolah. Dengan menjalankan kajian pengajaran, guru boleh bekerjasama dan meraih manfaat yang boleh diraih bersama dalam memperbaiki pengajaran dan pembelajaran bahasa Melayu di bilik darjah.

Konsep karangan naratif juga telah mendapat perhatian ramai pengkaji. Mahzan Arshad (2003), mengatakan bahawa teks naratif menampilkan pelbagai cerita dan disusun dalam satu pola yang mengandungi bahagian pengenalan, perkembangan dan akhiran. Kumpulan guru dalam kajian pengajaran ini turut menumpukan pada unsur-unsur penting dalam penulisan agar pelajar mahir dalam menyediakan struktur menulis yang lebih teratur dan bersistem.

Yahya Othman (2005) pula menyatakan penguasaan kemahiran menulis bukan hanya bergantung kepada bakat semata-mata malah dipengaruhi juga oleh pengajaran menulis yang bersistem dan berkesan. Oleh yang demikian, kumpulan guru berpendapat bahawa dengan pengenalan dan penggunaan konsep PADI ini akan

memberikan pelajar kemahiran dan cara untuk memperbaiki hasil penulisan mereka.

Sehubungan dengan hal ini, Nik Safiah Karim (2004), berpendapat proses menulis karangan merupakan kemahiran yang paling sukar untuk dikuasai, jika dibandingkan dengan kemahiran bahasa yang lain dan ramai orang tidak mahir menulis.

## 5 KAEDAH KAJIAN

Setelah meneliti masalah kajian yang menjadi keprihatinan guru dalam pengajaran dan pembelajaran, kumpulan guru telah bersetuju untuk melaksanakan kajian yang menggunakan pendekatan kajian pengajaran. Guru menggunakan Kajian Pengajaran bersifat eksperimental kepada kumpulan pelajar yang terlibat dalam kajian ini. Kajian pengajaran yang dijalankan mengikut prosedur yang telah ditentukan lebih awal. Di peringkat awalnya, guru mengenal pasti dan berbincang mengenai perkara yang menjadi fokus kajian yang akan dijalankan.

Kumpulan guru berbincang dan mendapatkan pandangan guru pakar mengenai perancangan dan pelaksanaan kajian yang bakal dijalankan. Setelah itu, guru memberi fokus kepada perbincangan mengenai bahan dan kemahiran bahasa yang ingin ditekankan dalam kajian. Pembinaan bahan pengajaran mengambil kira pandangan kumpulan guru bagi memastikan pelajaran yang dirancang telah diteliti dan dirancang sebaik yang mungkin. Dalam proses ini, segala maklum balas diambil kira bagi memastikan pelajar meraih manfaat yang maksimum apabila pengajaran kajian dilaksanakan.

Proses pembelajaran ini memuatkan Rancangan Pengajaran Kajian Kitaran 1 dan Kitaran 2. Setiap rancangan pengajaran telah dibincangkan oleh kumpulan kajian pengajaran bagi memastikan pembaikan dilakukan demi menyediakan pengalaman pembelajaran yang menarik, bermakna dan berkesan dalam meningkatkan pengalaman pembelajaran pelajar. (Sila rujuk Lampiran 1 dan 2 bagi perincian mengenai maklum balas kumpulan guru bagi memperbaiki proses pembelajaran bagi Kitaran 1 dan Kitaran 2 kajian pengajaran yang dilaksanakan.)

Strategi pengajaran yang digunakan semasa Kajian Pengajaran ini dijalankan adalah pembelajaran secara kooperatif. Dalam pengajaran yang dilaksanakan, pelajar melengkapkan tugas secara kumpulan seperti aktiviti mengenal pasti elemen-elemen dalam konsep P.A.D.I dan menulis bahagian-bahagian tertentu karangan (pendahuluan dan klimaks). Ketua kumpulan yang dilantik dalam kalangan pelajar akan melakukan pembentangan dari hasil tugas yang diberikan oleh guru.

Kajian Pengajaran yang dijalankan melalui dua proses kitaran kajian. Kitaran kajian pertama dijalankan pada 24 April 2011. Cikgu Rose Ghani merupakan guru pelaksana bagi Pengajaran Kajian ini. Kitaran Kajian yang kedua dilaksanakan pada 3 Ogos oleh Cikgu Faridah Taib.

## 5.1 Subjek Kajian

Subjek kajian terdiri daripada 16 orang pelajar Menengah 2 Ekspres tahun 2011. Kaedah Kajian Pengajaran yang dijalankan berbentuk eksperimental dan diadakan sebanyak dua kali pusingan iaitu pada 28 April 2011 dan 3 Ogos 2011.

Guru Pakar dari Pusat Bahasa Melayu Singapura, Kementerian Pendidikan, turut serta berperanan sebagai Orang yang Berwibawa atau *Knowledgeable Others* semasa kajian ini dijalankan. Beliau turut memantau penyelidikan pengajaran dan memberikan nilai tambah kepada proses kajian yang dijalankan.

## 5.2 Prosedur Kajian

### Kajian Pengajaran I

Kajian Pengajaran dijalankan dengan menggunakan kaedah pengajaran dalam kelas. Proses untuk membina Kajian Pengajaran meliputi merangka langkah pengajaran, pengumpulan data-data ujian prakajian, poskajian dan soal-selidik.

Kajian Pengajaran memberikan fokus kepada aspek pemerhatian pada sikap dan cara belajar para pelajar semasa pengajaran dan pembelajaran berlangsung. Kajian Pengajaran ini berpusat pada para pelajar sementara para guru dalam kumpulan kajian bertindak sebagai pemerhati semasa guru utama menjalankan pengajaran.

Kajian pertama diadakan pada 28 April 2011. Guru telah menggunakan strategi pembelajaran kooperatif dalam pengajaran. Alat bantu video digunakan untuk merakam kegiatan pelajar dalam sesi pengajaran yang dijalankan.

Pengajaran bermula dengan guru menerangkan objektif pengajaran. Guru menayangkan klip video dari laman *youtube* yang mengandungi sebuah lagu berjudul 'Mentera Semerah Padi' yang dinyanyikan oleh M. Nasir untuk mengaitkan perkataan padi dengan konsep 'P.A.D.I.' yang diperkenalkan oleh guru. Guru menerangkan pemilihan lagu tersebut dan meminta pelajar memberikan beberapa peribahasa Melayu yang menggunakan perkataan padi.

Langkah kedua pengajaran memerlukan guru menerangkan konsep akronim 'P.A.D.I.' iaitu yang terdiri daripada elemen dan akronim berikut. Setiap

elemen diberikan warna tertentu untuk membezakan penggunaannya.

P =	Perasaan (Biru)
A =	Aksi (Hijau)
D =	Dialog (Merah)
I =	Idea (Hitam)

Seterusnya, guru menerangkan dengan lebih terperinci setiap elemen dan memberikan contoh-contoh relevan yang dipetik daripada cerpen 'Ayah'. Contoh petikan bagi setiap elemen adalah seperti yang berikut:

- Perasaan - Perasaan ialah sesuatu yang dirasa dalam hati. Contohnya ialah perasaan marah, sedih, gembira dan sebagainya.

Contoh:

*Betapa terguris tangkai jantung hatiku pada saat dan ketika itu. Titisan air mataku tergantung di dagu, kemudian jatuh satu persatu.*

- Aksi - Aksi ialah tingkah laku, sikap atau gerak-geri.

Contoh:

*Aku terkenang saat kata-kata kesat tersebut dilafazkan dengan lantang.*

*Aku menapak berat ke arah muka pintu. Daun pintu kubuka, kakiku melangkah keluar dari rumah yang selama ini aku ibaratkan seperti syurga.*

- Dialog – Dialog ialah kata-kata yang dituturkan oleh watak

Contoh:

*"Keluar engkau dari rumah ini, anak yang tak tahu untung. Pergi berambus!"*

- Idea – Idea ialah buah fikiran, gagasan dan jalan cerita. Idea cerita mengandungi permulaan, konflik, klimaks, dan penyelesaian.

Contoh:

*"Keluar engkau dari rumah ini, anak yang tak tahu untung. Pergi berambus!" suara ayah menerjah masuk kededua belah kuping telingaku.*

Langkah seterusnya, guru memberi arahan kepada pelajar untuk mengenal pasti dan menandakan elemen-elemen konsep 'P.A.D.I.' yang terdapat dalam perenggan yang telah ditentukan dalam cerpen 'Ayah'. Kemudian, ketua kumpulan membentangkan dapatan mereka.

Setelah pelajar mengenali konsep 'P.A.D.I.', mereka ditugaskan untuk menulis bahagian pendahuluan sebuah karangan yang bertemakan 'Pengorbanan'. Pelajar boleh merujuk dan menggunakan senarai frasa berbunga yang diberi terlebih dahulu. Ketua kumpulan akan membentangkan hasil karangan bahagian pendahuluan tersebut.

Semasa guru utama menjalankan pengajaran dan pembelajaran, guru-guru pemerhati akan menilai respons para pelajar. Setelah itu, perbincangan dijalankan oleh guru-guru yang terlibat dalam Kajian Pengajaran ini.

Berdasarkan pusingan Kajian Pengajaran yang pertama, guru-guru telah mendapatkan maklum balas dan saranan daripada Orang yang Berwibawa. Terdapat bahagian-bahagian pengajaran yang harus diperbaiki pada pusingan Kajian Pengajaran selanjutnya.

Kajian Pengajaran pusingan kedua telah dijalankan pada 3 Ogos 2011, setelah dilakukan beberapa perubahan pada Kajian Pengajaran I. Perubahan-perubahan yang dilakukan untuk Kajian Pengajaran II adalah seperti yang berikut:

- i) menukar penggunaan video klip lagu yang lebih bersesuaian di bahagian set induksi. Guru telah menggunakan lagu puisi ‘Ini Nasi Yang Kusuap’ yang dinyanyikan oleh Kumpulan Nuradee. Di samping lagu yang diperdengarkan, klip video tersebut juga menunjukkan proses menanam padi;
- ii) semasa pengajaran, guru mengaitkan lebih lanjut konsep padi sebenar dengan Konsep ‘P.A.D.I’ dalam karangan. Hasil padi sebenar ialah campuran antara titik peluh, ‘darah’ petani dan alam semula jadi. Oleh sebab itu, untuk menghasilkan karangan yang baik mesti mempunyai kandungan elemen-elemen konsep ‘P.A.D.I’;
- iii) memberi setiap kumpulan hanya satu elemen sahaja untuk dikenal pasti dan ditandai dengan warna tertentu; dan
- iv) kumpulan diberi tema baharu, iaitu ‘Kejujuran’ dan dikehendaki menulis bahagian klimaks karangan tersebut.

## 6 DAPATAN KAJIAN

Dapatan kajian yang dijalankan menunjukkan kesan yang positif bukan sahaja kepada pelajar tetapi juga kepada kumpulan guru yang menjalankan kitaran kajian pengajaran. Seperti yang telah ditegaskan oleh kajian-kajian pengajaran yang lain, jelas sekali bahawa dengan bekerjasama dan penglibatan yang aktif dalam kumpulan kajian pengajaran ini, guru mendalami apa yang sebenarnya berlaku semasa pengajaran dan pembelajaran dijalankan. Dalam perkataan lain, guru meneliti respons dan tindak balas pelajar semasa guru menjalankan pengajaran. Hal ini membantu guru untuk meneliti apakah langkah-langkah pengajaran yang berkesan dan bahagian mana pula yang perlu diperbaiki. Guru juga meneliti kesesuaian bahan pengajaran dan pedagogi yang digunakan. Guru sentiasa meneliti

keberkesanan pendekatan dalam membantu proses pembelajaran pelajar.

### 6.1 Impak Kepada Guru

Kajian Pengajaran yang dilaksanakan memberikan impak yang positif dan membina bagi guru. Selain merangsang minat dan keghairahan guru dalam melaksanakan kajian pengajaran yang dirancang, guru juga mendapati bahawa para pelajar bersikap positif terhadap proses pengajaran dan pembelajaran yang dilaksanakan. Guru mendapati bahawa mereka berpeluang untuk memerhatikan dengan secara teliti dan terperinci bagaimana proses pembelajaran pelajar semasa pengajaran kajian dijalankan. Berikut adalah refleksi para guru mengenai Pengajaran Kajian yang telah dilaksanakan.

#### Guru yang Menjalankan Pengajaran

*Saya amat teruja kerana dipilih untuk menjalankan kelas bagi Kajian Pengajaran ini. Topik Kajian Pengajaran yang kami pilih memang baik dan sesuai untuk pelajar. Saya berpuas hati kerana objektif pengajaran dapat dicapai. Pelajar-pelajar diperkenalkan dengan konsep PADI ini dan mereka mengaplikasikan konsep PADI secara sedar semasa menulis karangan naratif, agar dapat menghasilkan karangan yang lebih baik dan menarik.*

- Cikgu Rose Ghani

*Sebagai guru bagi Kajian Pengajaran Kitaran 2, saya berpendapat bahawa pelajar-pelajar begitu baik dari segi kelakonan. Mereka dapat memberi respons dengan baik semasa guru memberikan soalan rangsangan dan semasa menjalankan aktiviti yang diarahkan guru. Pelajar-pelajar lebih memahami konsep PADI tersebut.*

- Cikgu Faridah

#### Guru Pemantau 1

*Dengan memperkenalkan konsep PADI ini, pelajar-pelajar mendapat pendedahan yang baik dari segi strategi untuk menulis karangan yang lebih bermutu dan baik.*

- Cikgu Rohani

#### Guru Pemantau 2

*Secara keseluruhan, Kajian Pengajaran yang dijalankan sungguh baik terutama sekali langkah induksi. Walaupun klip video yang digunakan agak padat dari segi isi, namun klip video tersebut iaitu puisi lagu Ini Nasi Yang Kusuap oleh kumpulan Nuradee telah menimbulkan kesedaran kepada*



pelajar dan mereka dapat menghargai jasa petani serta rezeki yang mereka perolehi.

- Cikgu Mastura

Guru Pemantau 3

Sebagai guru baru dalam kumpulan Kajian Pengajaran, saya berbesar hati kerana dapat melibatkan diri dalam Kajian Pengajaran ini. Saya dapati pelajar-pelajar amat responsif dan dapat melakukan tugas yang diberi dengan baik, walaupun terdapat sebahagian pelajar yang agak kecoh ketika melakukan tugas yang diberi. Konsep PADI yang diperkenalkan amat mudah untuk mereka ikuti dan saya harap mereka dapat terus menggunakan konsep ini ketika mengarang karangan naratif.

- Cikgu Suhailah

**6.2 Impak kepada Murid**

Daripada pemerhatian dan pertanyaan yang diajukan kepada pelajar didapati bahawa pelajar dapat memahami konsep PADI yang baru diperkenalkan. Pelajar juga dapat mengaplikasikan konsep PADI dalam karangan naratif. Pelajar didapati juga lebih berkeyakinan dan secara sedar menggunakan konsep PADI apabila mengarang karangan naratif.

Guru juga mendapati bahawa pelajar dapat menghasilkan karangan naratif yang lebih baik dan menarik dari segi bahasa dan idea. Pelajar mendapati bahawa konsep yang diperkenalkan mudah difahami. Mereka lebih yakin atau konfiden untuk menggunakan pendekatan yang dipelajari dalam karangan mereka. Daripada refleksi pelajar, rata-rata mereka menyukai konsep yang dipelajari kerana mudah difahami dan mereka bebas menggunakan pelbagai warna sesuai dengan keperluan pembelajaran mereka.

Analisis keputusan pelajar

Kumpulan kajian pengajaran telah meneliti pencapaian pelajar sebelum dan selepas penggunaan dan pendekatan yang menggunakan konsep PADI dalam pengajaran dan pembelajaran. Jelas sekali bahawa setelah penggunaan konsep PADI diperkenalkan, terdapat peningkatan dalam peratusan pelajar yang cemerlang dalam kelakonan mereka dalam peperiksaan pertengahan dan akhir tahun. Data ini juga menunjukkan bahawa, semakin mahir pelajar kepada penggunaan konsep PADI, peratusan pelajar yang mendapat keputusan cemerlang dalam peperiksaan meningkat dari tahun 2011 hingga ke tahun 2012.

Keputusan adalah berdasarkan pencapaian kumpulan sasaran Menengah 2 Ekspres (2011).

Jadual 1: Tahun 2010 (Sebelum konsep PADI diperkenalkan):

Peperiksaan	% Lulus	% Cemerlang
SA 1	100	0
SA 2	100	12.5

Sebelum pendekatan dan penggunaan konsep PADI diperkenalkan kepada para pelajar iaitu pada tahun 2010, tidak ada pelajar yang meraih keputusan cemerlang walaupun kesemuanya lulus dalam peperiksaan pertengahan dan akhir tahun. Namun, setelah konsep PADI diperkenalkan kepada para pelajar tahun 2011, peratusan pelajar yang meraih keputusan cemerlang mula meningkat.

Jadual 2: Tahun 2011 (konsep PADI diperkenalkan)

Peperiksaan	% Lulus	% Cemerlang
SA 1	93.8	43.8
SA 2	100	18.8

Jadual 3: Tahun 2012 (pelajar sudah tahu menggunakan konsep PADI)

Peperiksaan	% Lulus	% Cemerlang
SA 1	100	70.6
SA 2	100	41.2

Peratusan cemerlang tertinggi dapat dilihat pada tahun 2012 berdasarkan keputusan peperiksaan SA1. Soalan peperiksaan pada Kertas 1 Bahagian B hanya memberi tumpuan kepada karangan jenis naratif untuk menguji kebolehan pelajar mengarang dengan menggunakan konsep PADI yang telah diajar. Daripada keputusan yang dicapai, dapat dirumuskan bahawa dengan memperkenalkan konsep PADI, dapat membantu pelajar mengarang karangan jenis naratif dengan lebih baik dan menarik dari segi bahasa dan idea.

## 7 KESIMPULAN KAJIAN

Melalui kaedah Kajian Pengajaran (*Lesson Study*) yang dijalankan, serta memperkenalkan konsep PADI kepada para pelajar dan mengaplikasikan konsep tersebut, dapat dirumuskan bahawa terdapat peningkatan dari segi kualiti dan kreativiti dalam hasil penulisan karangan para pelajar. Pelajar secara sedar dapat menggunakan konsep tersebut dengan baik. Penggunaan elemen-elemen konsep PADI dapat membantu pelajar menulis karangan yang berkualiti dari segi bahasa dan idea. Konsep 'P.A.D.I.' ini akan seterusnya diperkenalkan kepada para pelajar menengah satu hingga tiga. Kumpulan guru pengkaji berharap dengan penggunaan konsep PADI, para pelajar akan terus dapat menghasilkan karya yang bermutu dan mencapai prestasi yang cemerlang dalam subjek Bahasa Melayu.

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**PROSES PEMBELAJARAN KAJIAN  
Rancangan Pengajaran Kajian (Kitaran 1)**

**Matlamat Pengajaran**

Pelajar dapat:

1. mengenali konsep “PADI”
2. menulis karangan naratif deng menggunakan konsep “PADI”.

Aktiviti Pembelajaran dan Soalan-soalan guru		Reaksi pelajar yang dijangkakan	Sokongan guru (soalan susulan sebagai panduan terhadap pembelajaran pelajar)	Penilaian Bagaimanakah penilaian dilakukan? Apakah wahana ( <i>tools</i> ) yang digunakan?
Masa	Aktiviti			
5 minit	<p><b>Induksi</b></p> <p>Guru memberitahu pelajar yang mereka akan diajar sesuatu yang baru.</p> <p>Guru menayangkan klip video lagu “Semerah Padi” nyanyian M. Nasir.</p> <p>Guru menerangkan objektif penayangan klip video dan mencungkil pengetahuan pelajar dengan bertanyakan soalan rangsangan berkaitan dengan padi.</p>	<p>Pelajar duduk dalam kumpulan. Setiap kumpulan mempunyai 6 orang pelajar.</p> <p>Pelajar berasa ghairah dan cuba meneka pengajaran yang akan diberi guru.</p> <p>Pelajar menonton klip video lagu Semerah Padi.</p> <p>Pelajar berasa seronok dan gembira menonton klip video nyanyian.</p> <p>Pelajar memberi beberapa</p>	<p>“Pelajar, hari ini kita akan mempelajari sesuatu yang baru. Tetapi sebelum itu saya akan memperdengarkan lagu ini”</p> <p>“Berikan beberapa peribahasa yang berkaitan dengan padi.”</p>	<p>Pelajar dapat memberi beberapa peribahasa seperti ayam bertelur di padi, ikut resmi padi semakin berisi semakin tunduk, nasi sudah menjadi bubur dan sebagainya.</p>

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Aktiviti Pembelajaran dan Soalan-soalan guru		Reaksi pelajar yang dijangkakan	Sokongan guru (soalan susulan sebagai panduan terhadap pembelajaran pelajar)	Penilaian Bagaimanakah penilaian dilakukan? Apakah wahana ( <i>tools</i> ) yang digunakan?
Masa	Aktiviti			
		peribahasa.		
10 minit	<p><b>Langkah 1</b></p> <p><u>Perkembangan</u> Guru menerangkan tentang konsep ‘PADI’ dengan lebih lanjut. P – Perasaan, A – Aksi, D – Dialog dan I – Idea. Akronim diberi lambang warna iaitu: P (Biru), A (Hijau), Dialog (Merah) dan Idea (Hitam). Guru menerangkan konsep dengan menggunakan slaid ‘powerpoint’.</p> <p>Guru menunjukkan slaid contoh-contoh konsep PADI yang mempunyai kod warna berdasarkan petikan cerpen ‘Ayah’.</p>	Pelajar menumpukan perhatian dengan penerangan guru dan slaid ‘powerpoint’ yang ditayangkan.	Slaid ‘ <i>powerpoint</i> ’ mengandungi penerangan tentang konsep PADI.	Guru mengajukan soalan rangsangan dengan bertanyakan tentang warna-warna tertentu untuk setiap elemen konsep PADI. - Apakah warna untuk perasaan? dan seterusnya....
25 minit	<p><b>Langkah 2</b></p> <p>Guru memberi salinan petikan cerpen ‘Ayah’ dan ‘highlighter’ kepada setiap kumpulan. Pelajar diarah untuk mewarnakan bahagian-bahagian konsep PADI yang terdapat dalam pendahuluan</p>	Secara kumpulan, pelajar mengenalpasti dan menulis semula bahagian-bahagian konsep PADI yang terdapat dalam cerpen ‘Ayah’ di kertas sebak.	Guru menunjukkan petikan bahagian pendahuluan cerpen yang telah diwarnakan berdasarkan konsep PADI.	Pelajar dapat menunjukkan kepelbagaian warna yang berbeza dalam bahagian pendahuluan petikan cerpen berdasarkan konsep PADI.

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Aktiviti Pembelajaran dan Soalan-soalan guru		Reaksi pelajar yang dijangkakan	Sokongan guru (soalan susulan sebagai panduan terhadap pembelajaran pelajar)	Penilaian Bagaimanakah penilaian dilakukan? Apakah wahana ( <i>tools</i> ) yang digunakan?
Masa	Aktiviti			
	cerpen.	Ketua kumpulan mempersembahkan hasil kerja mereka.		
10 minit	<p><b>Langkah 3</b></p> <p>Guru memberi tugas kepada pelajar berdasarkan tema Pengorbanan. Pelajar diarah untuk mengarang bahagian pendahuluan sebuah cerpen.</p> <p>Guru memberi senarai frasa berbunga dan contoh karangan yang baik.</p>	<p>Secara kumpulan, pelajar menjana idea dan menulis bahagian pendahuluan karangan yang bertemakan ‘Pengorbanan’ di kertas sebak.</p> <p>Pelajar berasa teruja semasa melakukan kegiatan tersebut.</p> <p>Ketua kumpulan mempersembahkan hasil penulisan karangan bahagian pendahuluan.</p>	<p>Lembaran kertas sebak untuk murid menulis karangan bahagian pendahuluan, dan “<i>marker</i>” pelbagai warna,</p> <p>Guru memantau kerja setiap kumpulan dan memberi bantuan yang sepatutnya kepada pelajar.</p>	Pelajar dapat menulis tugas yang diberi dan ketua kumpulan membuat pembentangan di dalam kelas.
5 minit	<p><b>Aktiviti (Penutup)</b></p> <p>Guru memberi soalan rangsangan kepada pelajar untuk mencungkil pemahaman mereka tentang konsep</p>	Pelajar menumpukan perhatian.	Guru mengajukan soalan-soalan rangsangan. Contoh:	Pelajar dapat memberi respons dengan betul.

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Aktiviti Pembelajaran dan Soalan-soalan guru		Reaksi pelajar yang dijangkakan	Sokongan guru (soalan susulan sebagai panduan terhadap pembelajaran pelajar)	Penilaian Bagaimanakah penilaian dilakukan? Apakah wahana ( <i>tools</i> ) yang digunakan?
Masa	Aktiviti			
	<p>PADI.</p> <p>Guru membuat rumusan dengan mengulang semula konsep PADI secara ringkas.</p> <p>Guru menekankan penggunaan konsep PADI untuk mendapatkan hasil karangan yang menarik dari segi idea dan bahasa.</p>		<p>Apakah yang dimaksudkan dengan konsep PADI?</p> <p>Apakah warna untuk P, A, D, I?</p>	<p>Pelajar dapat mempelajari satu konsep baru iaitu konsep PADI dalam menulis karangan naratif.</p>

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**LAMPIRAN 2**

**PROSES PEMBELAJARAN KAJIAN**

**Rancangan Pengajaran Kajian (Kitaran 2)  
Matlamat Pengajaran**

Pelajar dapat:

1. mengenali konsep “PADI”
2. mengaplikasi konsep “PADI” dalam penulisan karangan
3. menulis dengan lebih baik dan menarik karangan naratif dengan menggunakan konsep “PADI”
4. menggunakan enam atau lebih frasa berbunga.

Aktiviti Pembelajaran dan Soalan-soalan guru		Reaksi pelajar yang dijangkakan	Sokongan guru(soalan susulan sebagai panduan terhadap pembelajaran pelajar)	Penilaian Bagaimanakah penilaian dilakukan?Apakah wahana ( <i>tools</i> ) yang digunakan?
Masa	Aktiviti			
15 minit	<p><b>Induksi</b></p> <p>Guru mengarahkan pelajar supaya duduk dalam kumpulan. Setiap kumpulan terdiri daripada 4 orang.</p> <p>Guru menerangkan objektif pengajaran pada hari itu.</p> <p>Guru menayangkan klip video daripada “Youtube” lagu “Ini Nasi Yang Ku Suap” nyanyian kumpulan Nuradee.</p>	<p>Pelajar duduk dalam kumpulan. Setiap kumpulan mempunyai 4 orang pelajar. Mereka menunggu arahan selanjutnya.</p> <p>Murid menonton klip video lagu Ini Nasi Yang Kusuap. Mereka berasa seronok dan menonton klip video nyanyian dan menghayati</p>	<p>“Pelajar, hari ini kita akan mengukuhkan lagi pemahaman awak tentang konsep PADI”.</p> <p>Klip video Youtube “Ini Nasi Yang Kusuap” nyanyian Nuradee.</p> <p>Soalan (guru): Apakah pandangan awak tentang puisi lagu tersebut?</p>	<p>Pelajar menghayati klip video dan puisi lagu Ini Nasi Yang kusuap.</p> <p>Pelajar dapat memberi respons yang baik:</p> <p>“Amat menghargai penderitaan kaum tani.”</p>

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Aktiviti Pembelajaran dan Soalan-soalan guru		Reaksi pelajar yang dijangkakan	Sokongan guru(soalan susulan sebagai panduan terhadap pembelajaran pelajar)	Penilaian Bagaimanakah penilaian dilakukan?Apakah wahana ( <i>tools</i> ) yang digunakan?
Masa	Aktiviti			
	<p>Guru menerangkan objektif penayangan klip video dan mencungkil pengetahuan pelajar dengan bertanyakan soalan rangsangan berkaitan dengan padi.</p> <p>Guru juga menerangkan konsep biji padi yang sebenar dan kaitan padi dengan masyarakat Melayu dengan menayangkan slaid gambar-gambar mengenai proses menanam padi.</p> <p>Guru mengaitkan konsep padi sebenar dengan konsep PADI dalam penulisan karangan.</p>	<p>lirik atau puisi lagu tersebut. Pelajar memberi respons terhadap soalan yang diajukan.</p>	<p>Slaid gambar-gambar proses penanaman padi.</p> <p>Guru menjalin pemahaman pelajar: “Untuk mendapatkan hasil padi, petani banyak berkorban dari segi tenaga, penderitaan dan masalah yang dilalui dari mula proses menanam padi hingga ke musim menuai. Begitu juga dengan proses menulis karangan. Untuk mendapat hasil karangan yang baik dan menarik, kita juga mesti melalui proses sedemikian iaitu dengan memasukkan elemen-elemen Perasaan, Aksi, Dialog dan Idea (PADI).</p>	<p>“Bersyukur kerana dapat makan nasi dan menikmatinya.”</p>
20 minit	<p><b>Langkah 1</b></p> <p><u>Perkembangan</u> Guru menerangkan tentang konsep “PADI” dengan lebih lanjut. P – Perasaan, A – Aksi, D – Dialog</p>	<p>Pelajar menumpukan perhatian dengan penerangan guru dan slaid ‘powerpoint’ yang ditayangkan.</p>	<p>Slaid ‘powerpoint’ mengandungi penerangan tentang konsep PADI.</p>	<p>Pelajar dapat memberi respons dengan baik.</p>

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Aktiviti Pembelajaran dan Soalan-soalan guru		Reaksi pelajar yang dijangkakan	Sokongan guru(soalan susulan sebagai panduan terhadap pembelajaran pelajar)	Penilaian Bagaimanakah penilaian dilakukan?Apakah wahana ( <i>tools</i> ) yang digunakan?
Masa	Aktiviti			
	<p>dan I – Idea. Akronim diberi lambang warna iaitu: P (Biru), A (Hijau), Dialog (Merah) dan Idea (Hitam). Guru menerangkan konsep dengan menggunakan slaid ‘powerpoint’. Guru menunjukkan slaid contoh-contoh konsep PADI yang mempunyai kod warna berdasarkan petikan cerpen ‘Ayah’</p>		Guru mengaju soalan rangsangan dengan bertanyakan tentang warna-warna tertentu untuk setiap elemen konsep PADI.	
25 minit	<p><b>Langkah 2</b></p> <p>Guru memberi salinan petikan cerpen ‘Ayah’ dan ‘<i>highlighter</i>’ kepada setiap kumpulan.</p> <p>Pelajar diarah untuk mewarnakan bahagian-bahagian konsep PADI yang terdapat dalam pendahuluan cerpen.</p>	<p>Secara kumpulan, pelajar mengenal pasti dan menulis semula bahagian-bahagian konsep PADI yang terdapat dalam cerpen ‘Ayah’ di kertas sebak.</p> <p>Ketua kumpulan mempersembahkan hasil kerja mereka.</p>	Guru menunjukkan petikan bahagian pendahuluan cerpen yang telah diwarnakan berdasarkan konsep PADI.	Pelajar dapat menunjukkan kepelbagaian warna yang berbeza dalam bahagian pendahuluan petikan cerpen berdasarkan konsep PADI.
25 minit	<p><b>Langkah 3</b></p>			

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Aktiviti Pembelajaran dan Soalan-soalan guru		Reaksi pelajar yang dijangkakan	Sokongan guru(soalan susulan sebagai panduan terhadap pembelajaran pelajar)	Penilaian Bagaimanakah penilaian dilakukan?Apakah wahana ( <i>tools</i> ) yang digunakan?
Masa	Aktiviti			
	<p>Guru memberi tugas kepada pelajar berdasarkan tema Kejujuran. Pelajar diarah untuk mengarang bahagian klimaks sebuah cerpen.</p> <p>Guru memberi senarai frasa berbunga dan contoh karangan yang baik.</p>	<p>Secara kumpulan, pelajar menjana idea dan menulis bahagian klimaks karangan yang bertemakan Pengorbanan di kertas sebak.</p> <p>Pelajar berasa teruja semasa melakukan kegiatan tersebut.</p> <p>Ketua kumpulan mempersembahkan hasil penulisan karangan bahagian pendahuluan. Pelajar menampal hasil kerja mereka untuk ditonton oleh pelajar lain.</p>	<p>Lembaran kertas sebak untuk murid menulis karangan bahagian pendahuluan, dan “<i>marker</i>” berbagai warna,</p> <p>Guru memantau kerja setiap kumpulan dan memberi bantuan yang sepatutnya kepada pelajar.</p>	<p>Pelajar dapat menulis tugas yang diberi dan membuat persembahan di dalam kelas.</p> <p>Pelajar membuat laluan galeri (<i>Gallery Walk</i>) untuk melihat dan membaca hasil kumpulan lain.</p> <p>Pelajar dapat melihat hasil kerja kumpulan pelajar lain.</p>
20 minit	<p><b>Langkah 4</b></p> <p>Guru mengarahkan ketua kumpulan untuk membuat pembentangan hasil kerja kumpulan mereka.</p> <p>Guru mengarahkan pelajar bergerak secara kumpulan untuk ‘<i>Gallery walk</i>’</p>	<p>Ketua kumpulan mempersembahkan hasil penulisan karangan bahagian pendahuluan. Pelajar lain menumpukan perhatian.</p>	<p>Guru memberi sokongan moral kepada pelajar yang melakukan perrsembahan.</p>	<p>Pelajar membuat laluan galeri (<i>Gallery Walk</i>) untuk melihat dan membaca hasil kumpulan lain.</p> <p>Pelajar dapat melihat hasil</p>

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Aktiviti Pembelajaran dan Soalan-soalan guru		Reaksi pelajar yang dijangkakan	Sokongan guru(soalan susulan sebagai panduan terhadap pembelajaran pelajar)	Penilaian Bagaimanakah penilaian dilakukan?Apakah wahana ( <i>tools</i> ) yang digunakan?
Masa	Aktiviti			
		Pelajar menampal hasil kerja mereka untuk ditonton oleh pelajar lan.		kerja kumpulan pelajar lain. .
5 minit	<p><b>Penutup</b></p> <p>Guru memberi soalan rangsangan kepada pelajar untuk mencungkil pemahaman mereka tentang konsep PADI.</p> <p>Guru membuat rumusan dengan mengulang semula konsep PADI secara ringkas.</p> <p>Guru menekankan penggunaan konsep PADI untuk mendapatkan hasil karangan yang menarik dari segi idea dan bahasa.</p>	Pelajar menumpukan perhatian.	<p>Guru mengajukan soalan-soalan rangsangan. Contoh:</p> <p>Apakah yang dimaksudkan dengan konsep PADI.</p> <p>Apakah warna untuk P, A, D, I</p>	<p>Pelajar dapat memberi respons dengan betul.</p> <p>Pelajar dapat mempelajari satu konsep baru iaitu konsep PADI dalam menulis karangan naratif.</p>

### SARANAN DAN DAPATAN PEMANTAUAN

Kumpulan kajian pengajaran melakukan pemerhatian dan pemantauan setiap pelaksanaan pengajaran kajian yang dijalankan. Pemerhatian yang teliti dilakukan termasuklah dari segi perancangan, kebolehtadbiran rancangan pengajaran, strategi pengajaran yang

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diambil, bahan-bahan pengajaran yang digunakan serta respons pelajar terhadap pengajaran dan bahan pengajaran yang digunakan dalam proses pembelajaran. Guru-guru pemerhati memberikan input mengenai pengajaran yang dijalankan.

Antara saranan yang dikemukakan ialah mengenai kesesuaian bahan klip video yang digunakan bagi bahagian induksi dalam pengajaran dan pembelajaran. Bagi kitaran pertama, klip video bagi sesi induksi didapati kurang sesuai. Informasi ini membantu guru untuk mendapatkan klip video yang lebih sesuai bagi kitaran pengajaran yang kedua. Daripada kitaran pengajaran yang pertama juga, guru mendapati bahawa beberapa aspek penerangan tentang konsep PADI perlu diperjelas. Guru juga mendapati bahawa dari segi arahan dan aktiviti kumpulan juga boleh diperbaiki bagi memberikan kesan pembelajaran yang lebih bermakna dan berkesan.

Berikut adalah saranan dan dapatan yang diberikan bagi setiap pengajaran kajian yang dilaksanakan. Saranan dan Dapatan Kitaran Pertama merupakan hasil pemantauan yang pertama. Saranan dan dapatan ini akan digunakan untuk memperbaiki rancangan pengajaran yang kedua. Saranan dan dapatan kitaran kedua akan digunakan untuk memperbaiki pengajaran yang seterusnya.

<b>Saranan Dan Dapatan Kitaran Pertama</b>	<b>Saranan Dan Dapatan Kitaran Kedua</b>
<p><b><u>Maklum balas dari Guru Pakar:</u></b> <b><u>Induksi:</u></b></p> <p>Penggunaan klip video <i>Youtube</i> lagu ‘Semerah Padi’ agak terlalu panjang dan tiada begitu jelas terdapat kaitan dengan pengajaran konsep PADI.</p> <p>Namun, penggunaan slaid gambar-gambar yang menunjukkan proses penanaman padi amat baik dan relevan kerana mempunyai kaitan dengan tajuk pengajaran konsep PADI.</p> <p><b><u>Langkah-langkah Pengajaran</u></b></p> <p>Secara keseluruhan, langkah-langkah pengajaran yang dilakukan guru mendapat respons atau maklum balas yang baik dari Guru Pakar Cikgu Mohd Rafi (<i>Knowledgeable Others</i>) yang telah diundang untuk memantau</p>	<p><b><u>Induksi:</u></b></p> <p>Setelah mendapat maklumbalas dari Guru Pakar Cikgu Mohd Rafi, guru telah menukar bahan bantuan untuk induksi Guru telah menggunakan petikan klip video puisi lagu Ini Nasi Yang Kusuap, nyanyian kumpulan Nuradee. Guru Pakar amat berpuas hati dengan penggunaan klip video yang amat relevan dengan konsep P.A.D.I yang hendak diajar guru. Klip video ini menunjukkan cara petani menjalani proses penanaman padi dan segala penderitaan mereka dapat dirasai oleh pelajar melalui lirik lagu tersebut. Pelajar dapat meluahkan semula dan memberi pendapat mereka tentang perasaan mereka ketika menonton klip video tersebut.</p> <p><b><u>Langkah-langkah Pengajaran</u></b></p> <p>Kekurangan dalam langkah-langkah pengajaran pada kitaran 1</p>

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Saranan Dan Dapatan Kitaran Pertama	Saranan Dan Dapatan Kitaran Kedua
<p>Kajian Pengajaran yang dijalankan. Namun terdapat bahagian-bahagian pengajaran yang perlu diperbaik atau disemak semula, iaitu:</p> <ol style="list-style-type: none"> <li>1) Konsep “P.A.D.I.’ tidak dijelaskan dengan lebih terperinci oleh guru, walaupun terdapat slaid powerpoint yang dipaparkan.</li> <li>2) Arahan yang diberikan kepada pelajar tidak begitu jelas untuk pelajar ikuti. Pelajar agak kurang pasti tentang aktiviti yang patut dilakukan.</li> <li>3) Setiap kumpulan sepatutnya diberi satu elemen konsep P.A.D.I yang berbeza semasa aktiviti mengenalpasti dan menanda konsep dalam petikan cerpen yang diberikan.</li> <li>4) Anggota kumpulan sebaiknya mestilah terdiri daripada 4 orang bukan 6 orang. Terdapat beberapa orang pelajar yang kurang fokus seketika semasa pengajaran.</li> </ol>	<p>telah disemak semula dan diperbaiki.</p> <ol style="list-style-type: none"> <li>1) Guru telah menerangkan konsep ‘P.A.D.I’ dengan lebih terperinci dan lebih jelas. Guru menggunakan slaid powerpoint dengan sepenuhnya.</li> <li>2) Guru juga telah memberi arahan dengan lebih jelas. Pelajar tidak begitu keliru ketika melakukan tugas mereka.</li> <li>3) Guru memberi satu elemen konsep P.A.D.I kepada satu kumpulan sahaja semasa aktiviti mengenalpasti dan menandakan elemen dalam cerpen yang diberi. Pelajar menjadi lebih tertumpu dan lebih konfiden semasa menjalankan aktiviti.</li> </ol> <p>Guru Pakar juga memberi respons yang positif terhadap kelakonan pelajar semasa Pengajaran Kitaran 2 :</p> <ol style="list-style-type: none"> <li>1) Pelajar amat teruja ketika melakukan aktiviti mengenal dan menandakan konsep, dan semasa membuat pembentangan hasil tugas mereka.</li> <li>2) Pelajar dapat mengarang bahagian klimaks secara berkumpulan dan membentangkan hasil karangan mereka dengan baik.</li> </ol> <p>Guru Pakar juga memberi pujian terhadap aktiviti yang dipelbagaikan iaitu:</p> <ol style="list-style-type: none"> <li>1) semasa Kajian Pengajaran Kitaran 1, pelajar diarahkan untuk</li> </ol>

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Saranan Dan Dapatan Kitaran Pertama	Saranan Dan Dapatan Kitaran Kedua
	<p>megaplikasikan konsep PADI dalam bahagian pendahuluan, manakala semasa Kajian Pengajaran Kitaran 2 pelajar mengaplikasikan konsep PADI dalam bahagian klimaks karangan.</p> <p>2) Aktiviti Laluan Galeri (Gallery Walk). Pelajar dapat melihat dan menilai hasil karangan dari kumpulan lain. Cara ini dapat juga menunjukkan kepada pelajar tentang kelebihan yang boleh dipelajari daripada kumpulan lain.</p>

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## Study on the Factors for Sustainable Development of the School-based Practical Researches

: *With usage of the Theories on Professional Learning Communities (PLCs)*

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**Abstract:** In Japan, lesson studies are so popular, which are core activities of School-Based Practical Researches (SBPRs). SBPRs in Japan are defined as a series of research-oriented activities conducted by teachers at the same school. They enrich practical knowledge and reconstruct their belief system through not only lesson studies but also other activities of SBPRs such as making portfolios on their teaching, holding practical conferences for teachers from other schools and so on. However, teachers in Japanese schools have difficulties in making SBPRs sustainable. To clarify the factors for sustainable development of the SBPRs in Japanese schools, firstly, in 2011, the authors made interviews with leading teachers to get information on their efforts to revitalize SBPRs extending for more than one year at three elementary schools and one junior high school, using theories on PLCs. The data indicated that there were 4 factors for sustainable development of the SBPRs at those schools. Secondly, to confirm the reliability of those factors on sustainable development of the SBPRs, the authors made interviews with leading teachers and supervisors about SBPR efforts extending for a few years at another 3 elementary schools. The authors clarified the existence of the fifth factor for the SBPRs development named "Looking for Evidence to Use for Teacher Empowerment". As a conclusion, the authors suggested the structural model of the factors for the sustainable development of SBPRs in consideration with the relationship among the 5 factors.

**Keywords:** School-based Practical Researches(SBPRs), Professional Learning Communities(PLCs), Lesson Study, Leading Teacher, Sustainable Development

### 1 INTRODUCTION

In Japan, lesson studies are so popular, which are core activities of School-Based Practical Researches (SBPRs). SBPRs in Japan are defined as a series of research-oriented activities conducted by teachers at the same school. They enrich practical knowledge and reconstruct their belief system through not only lesson studies but also other activities of SBPRs such as making portfolios on their teaching, holding practical conferences for teachers from other schools and so on. That means Japanese school teachers try to establish professional learning communities (PLCs) by means of not only lesson studies but also other activities in relation with them through SBPRs.

However, it is commonly agreed upon that the formation of PLCs is not easy. For example, Dooner et al. (2008) point out that the formation of PLCs take a lengthy period and require some measures to ease tension among members. As for SBPRs in Japan, Kihara (2010) suggests the necessity of special ideas when choosing research themes, settling annual activity plans, and establishing task forces for the planning and operation of SBPRs, and also

mentions the importance of the insight and skills of teacher leaders, who are responsible for the practical decision making involved in these activities. Previous studies mostly focused on the formation of PLCs and ignored the issue of their continual development. However, Hipp et al. (2008) note that although it is common understanding among researchers that the proliferation of leadership and school culture as a foundation to build upon are essential to maintain a long process of school improvement, the issues of the sustainability of PLCs and fully understanding them remain. Sato (2012) also mentions one problematic situation: there are practically no schools that undertake a designated research project under the designated experimental school system and continue their reform after the expiration of the prescribed period, because of the complexity of the factors of development in SBPRs. As these researchers referred to, teachers even in Japanese schools have difficulties in making SBPRs sustainable.

To clarify the factors for sustainable development of the SBPRs in Japanese schools, firstly, in 2011, the authors made interviews with

leading teachers to get information on their efforts to revitalize SBPRs extending for more than one year at three elementary schools and one junior high school, using theories on PLCs. The data indicated that there were 4 factors for sustainable development of the SBPRs at those schools. They are "A. Actualization of Distributed Leadership", "B. Formation of Group Identity", "C. Construction of Networking among Schools and Some Organizations outside the Schools" and "D. Acquisition of Required Resources and its Effective Use". Additionally, the authors revealed that each factor had 2 to 5 subcategories. The authors made the model of the factors for the development of SBPRs in consideration with the relationship among the above 4 factors (Figure1).

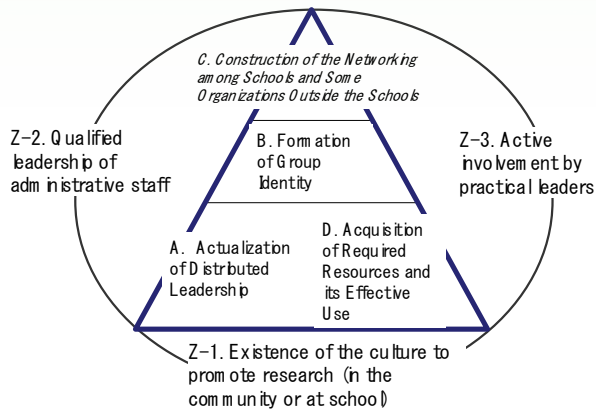


Figure1. Model of the factors for the development of school-based practical researches

## 2 RESEARCH QUESTION

To confirm the reliability of those factors on sustainable development of the SBPRs, the authors made interviews with leading teachers about SBPR efforts extending for a few years at another schools.

## 3 METHODOLOGY

### 3.1 Subjects

The subjects of this study were three elementary schools (the elementary schools H, T, and HJ) which received subsidies from a foundation for practical research during the years 2009 and 2010. These schools were engaged in SBPRs during the two years period in collaboration with university researchers who supervised the SBPRs.

All three of the schools applied for the practical research subsidy and proceeded with their SBPRs to spread and develop the ideas for ICT utilization inside and outside of schools. For example, Teachers at school H had been making their inquiries on the usage of tablet PC and IWB. In the process of their practical researches, teachers at school H also made

lesson studies and held the practical research conferences for teachers from other schools.

Because of the time lapse since the end of the two-year subsidy period, it was possible to compare the efforts between, during, and after the subsidy period and analyse the results. For these reasons, these schools were considered valid as research subjects to obtain knowledge on SBPR development.

### 3.2 Method of Data Collection

Firstly, the authors obtained an overview of practices of the three subject schools during the subsidy period, as well as their background situations regarding the acquisition of funding, by reviewing the research plans prepared at the time of application submission, in addition to the reports during and after the subsidy period. From July until October 2012, based on the information, the authors interviewed teachers who served as research-propelling leaders during the subsidy period. The interviews took the form of semi-structured interviews.

Questions asked to teacher leaders were categorized two parts. The first was about practice during the subsidy period which included the overview of practices (including teachers' learning) and things that the interviewee paid special attention to as a teacher leader for SBPR in promoting practices etc.

The second was about the practices after the subsidy period which included the situation while the teacher leader for SBPR was still at the school and after the teacher leader for SBPR left the school.

Each interview with teacher leaders for SBPR took around 58–95 minutes.

### 3.3 Analysis Procedure

First, the authors transcribed recordings of the interviews. Next, the transcribing data was sorted according to the questions. Then, they sorted the narratives about the SBPRs from the subsidy period according to 4 factors of our previous research. Throughout the process, one of the authors executed the extraction and (re)sorting of the narratives before the rest of the authors checked the result to confirm appropriateness, etc.



Table 1. Activities by three schools for SBPR development and structure of factors in SBPR development

Category	Sub-category	H	T	HJ
A. Actualization of Distributed Leadership	A-1. Collaboration and Cooperation among more than one teacher leader	○	○	○
	A-2. Role allotment to members by practical leaders		○	
	A-3. Scouting and nurturing of next generation of practical leaders			○
B. Formation of Group Identity	B-1. Establishment of a framework and procedure easily accepted by members	○	○	○
	B-2. Circulation of information and know-how on practice	○	○	○
	B-3. Introduction of activities in which all members participated	○		○
	B-4. Consideration for new members	○		○
C. Construction of the Networking among Schools and Some Organizations Outside the Schools	C-1. Special devices in preparing documents to advertise the products of SBPR	○		
	C-2. Emphasizing participants' activities at practical conferences for teachers from other schools	○		
	C-3. Active collection of assessment information on practices			
	C-4. Mediation by external organizations such as educational administration boards	○		○
	C-5. Continuation of public viewings of practices, and constructive formats			
D. Acquisition of Required Resources and its Effective Use	D-1. Acquisition of economic and material support and its effective use	○	○	○
	D-2. Acquisition of human support and its effective use	○	○	○
Z. Fundamental Factors	Z-1. Existence of the culture to promote research (in the community or at school)	○	○	○
	Z-2. Qualified leadership of administrative staff	○	○	○
	Z-3. Active involvement by practical leaders	○		○

## 4 RESEARCH FINDINGS

### 4.1 Situations of SBPR Development

Kihara (2008) established several perspectives for actions aimed at SBPR development, such as (1) restructuring the research theme, (2) reconstructing the research organization, (3) continuing the practices, and (4) disseminating information outside the school, thus providing bases for assessment. The review of the efforts at the three schools according to these perspectives revealed that in all cases, SBPR development took place in a situation meeting at least

one of these bases.

### 4.2 Factors for SBPR Development: Subordinate-level Categories

The factors that enabled SBPR development at the three schools, including their subordinate-level categories, were sorted as shown in Table 1. All of the aforementioned 4 factors for PLC development were observed in one way or another. As a result, the authors reconfirmed that above factors were also quite important for the sustainable development of the SBPRs at those schools.

#### 4.3 Another Factors for SBPR Development

In addition, the authors clarified the existence of the fifth factor for SBPR development named "E. Looking for Evidence to Use for Teacher Empowerment". For this new category, the following two subordinate categories were observed:

The first one is "E-1. Use evidence for reflection inside a school". Incidents belonging to this sub-category were observed in the efforts by Elementary school H and HJ. For example, teachers at school H collected the data of achievement test. The data indicated the efforts at school H were effective for students' learning. Therefore, teachers at school H were empowered and motivated for the sustainable development of the SBPRs.

The second subordinate category is "E-2. Use evidence for appeal to the educators outside a school". Examples of this were also observed in the efforts by elementary school H and HJ. Teachers at school H made efficient use of some kinds of data to appeal the school innovation to teachers outside the school, LEA staff and so on. In the practical conferences held at school H, the teachers gave presentations on the outstanding results of their practice by using the several kinds of data such as the achievement test and the questionnaire for students etc. These appeal made it possible for teachers at school H to develop the network for their SBPRs with the educators outside the school.

### 5 CONCLUSIONS AND DISCUSSION

In this study, the authors conducted a comparative examination of school-based practical researches at 3 schools with the aims of confirming the reliability of the factors on sustainable development of the SBPRs.

As a conclusion, the authors suggested the new model of the factors for the sustainable development of SBPRs in consideration with the relationship among the 5 factors mentioned above (Figure2).

Although the SBPR cases analysed in this research spanned several years, it is hardly a long enough period for full SBPR development. Considering that some schools in Japan maintain efforts to develop their practical studies for several decades, continued follow-ups of the SBPR cases the authors examined in this research are expected. Additionally, taking into account the fact that the subsidizing foundation specified the SBPR themes it is easy to conjecture that the development of the SBPRs at the schools was affected by some compelling forces. Accordingly, it is also our intent for the future to look into schools that are developing practical research outside the influence of such external agencies.

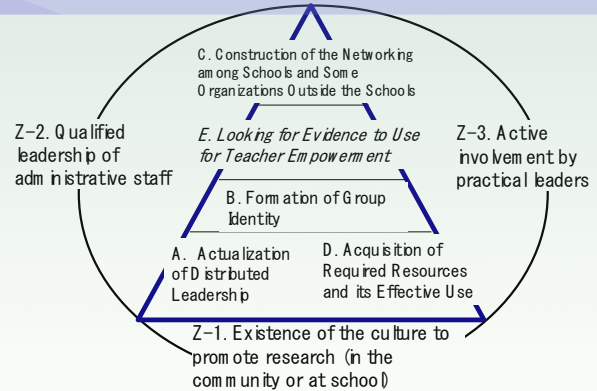


Figure2. New Model of the factors for the development of school-based practical researches

### 6 ACKNOWLEDGEMENTS

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## The Experience of Mathematics Teachers as a Model Teacher in The Lesson Study Activities in The West Part of Bandung City, Indonesia

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**Abstract:** This paper discusses the expression of model teacher that initially teaching mathematics in an open lesson setting. The LS were conducted as a collaboration between Mathematics Teachers Association (MGMP) of West Bandung of Bandung City and UPI. Changing process of teacher attitude and behavior in mathematics teaching need to be known by many people, due to generally most of the teachers when they are teaching mathematics do not want to be seen by other people. This situation causes that their mistake in teaching would be constantly happen, and usually the teachers do not want to learn from their mistakes and experiences. By performing as model teacher in an open lesson setting, it means that he/she is ready to be criticised by colleagues for improvement. Though in the development of professional teacher through LS, someone was not allowed to directly criticize a model teacher, someone can only give suggestion via the students' way of thinking, or students' strategy of learning, instead of directly critique the teacher's way teaching. In this situation, at least the model teachers have given the space in their heart to be criticised for correction by all audiences and all colleagues in the reflection session. There were 6 mathematics teachers who involved 240 students, how were their feeling and their expression to the initial model teacher in the setting of LS. The result indicated that model teachers positively impressed to this activity. They felt that all suggestions have given them a positive impact for improvement of their practice in the classroom.

**Keywords:** Model teacher, Lesson study, Experience of Mathematics Teacher

### 1. INTRODUCTION

The model teacher as an ideal teacher expected by a standard teacher. Model teacher was not easy job, due he/she would be observed by a lot of lesson study participants. Observers would observe intensively, though the focus of observation usually on the students learning process rather than the instruction parts. Therefore how was the student's reaction to the teacher's question, how did students follow to the teachers instruction. As consequence, the model teacher has to be able to choose the most appropriate instruction for the students so that they can interpret as well as able to translate into real action in the classroom.

The teacher instruction should be guided by a certain theory of learning or pedagogical knowledge. Step by step the teaching approach conducted by the teacher might follow the theory underpinning the lesson, and joining the syntax of the methods of learning.

According to Turmudi (2012) mathematics teaching as we observed in Indonesian classroom still emphasize on the teaching approach that dominated by the teachers, students were more pasive as reciever given by

teacher that usually only one way communication. Experts, such as Silver (in Turmudi, 2012) states in mathematics teaching usually students 'watching' what the teacher do and solved the problem in the black board in the classroom. Even Ernest (2004) adds student do mechanically as authomatons.

The transmission learning patterns as 'transfer knowledge' was sill dominated by the teachers, as teachers introduced the general rules, or formulas, than presented the exercises for the students (Thompson & Senk, 2003). These practices should be proposed to be modified in which the learners construct their own knowledge by involving the social aspect. It means that their colleagues in the classroom should control his own progress in conceptual and procedural understanding of mathematics.

This teaching paradigm might suggest that the teaching should conducted interactively. Two way communications between students and teacher, and multi-direction interaction among students should be the form of instruction in the classroom, therefore the academic climate of the class should be intercative and collaborative. Hence, the *cooperative learning* model facilitated learners to discuss, the students worked in pairs, worked

in small groups, and work in discussion should be part of Indonesian classroom.

Mathematics is not the lesson that should be learned closely in the isolated place so that the learners were away from the society. Mathematics has to be learned by individual where as her or his knowledge should be controlled and known by others. This is what we called as *social constructivism* theory in mathematics teaching and learning.

This paper aimed to uncover teacher experiences as a model teacher for the first time in Bandung City, Indonesia.

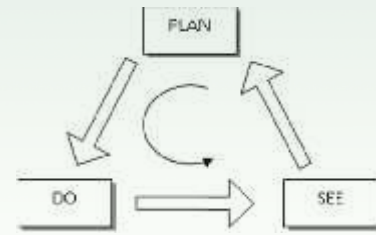
## 2. THEORETICAL FRAMEWORK

In conducting teaching innovation, the teacher can use new strategies to challenge students, to activate them, that take students to play role in constructing knowledge (Cobb, *et al.*, 1992). In other words, student played role as an active subject who build the knowledge of mathematics.

Teaching strategies of mathematics and teaching techniques that can be developed by the teachers in lesson study is still limited in number, therefore it needs to develop more strategies so that the teacher can learn from it, enable them to refer for teaching in an open lesson (Turmudi, 2008; Turmudi, 2009). These strategies should enable teacher to teach students in the constructivist paradigm. This is relevant to the work of Cobb, Driver, Asoko, Leach, Mortimer, and Scott (in Loucks-Horsley, 1998) “We recognize that learning is a process in which learner construct their own knowledge”.

Lesson study has many characteristics of effective professional development programs identified in previous research, such as: it is site-based, practice-oriented, focused on student learning, collaboration-based, and research-oriented (Bell and Gilbert 2004; Borko 2004; Cochran-Smith and Lytle 1999, 2001; Darling-Hammond 1994; Wang and O’Dell 2002; Little 2001; Hawley and Valli 1999; Wilson and Berne 1999). Lesson study places teachers at the center of the professional development activity with their interests and a desire to better understand student learning based on their own teaching experiences. The idea of lesson study is simple: teachers organically come together with a shared question regarding their students’ learning, plan a lesson to make student learning visible, and examine and discuss what they observe. Through multiple iterations of the process, teachers have many opportunities to

discuss student learning and how their teaching affects it.



Turmudi et al. (2010)

Lesson study typically follows the steps PLAN, DO, and SEE, with a research lesson (live lesson observation) as the centerpiece of the study process (Fernandez and Yoshida 2004; Lewis 2002; Lewis and Tsuchida 1998; Murata and Takahashi 2002; Wang-Iverson and Yoshida 2005). After identifying a lesson goal, teachers plan a lesson and implement it in the classroom. The goals can be general at first (e.g., how students understand the concept of sphere volume, Turmudi & Julia 2014), and are increasingly refined and focused throughout the lesson study process to become specific research questions by the end (e.g., strategies students use to balance for learning a linear equation, Turmudi & Dwi Haryanto, 2011).

According to Fernandez (2005), lesson study provides opportunities for teachers to develop their pedagogical content knowledge. Different types of knowledge (e.g., knowledge of content, curricula, and student learning, history of content development) come together and interact with one another during the lesson study cycle. An ideal context is created in which teachers can integrate these types of knowledge and make content accessible to their students in the classroom. Often in traditional professional development, these different types of knowledge are learned separately (e.g., attending a lecture on math content, reading a book on classroom management).

In this situation sometimes the teacher has very advance in pure mathematical knowledge, but very poor in pedagogical knowledge. In the contrary, the teacher has abundant of strategies in teaching mathematics, but he or she poor in the content of mathematics. It could not be like that, the teacher has to be mastered in both either content knowledge as well as pedagogical knowledge. In the other words, the teacher should has pedagogical content knowledge.

## 2.1 Adapting lesson study for Indonesian Setting

In Indonesia, lesson study was introduced through the JICA activities since 2000s which has a collaboration project among Indonesian and Japan sites. In Indonesian site (UPI, UNY, and UM) and Japanese site worked collaboratively. Japanese provided experts to support the teacher as well as lecturers in providing and improving pedagogical content knowledge (PCK) of mathematics. Through the multiple activities such as working group conference, task-team meeting, seminar, national and international seminar, writing the mathematics and science textbooks, among three universities the Indonesia site (UPI, UNY, and UM) the notion of lesson study was learned guided by Japanese experts. This was followed by conducting the piloting project as triangle collaborative between Japanese government, Indonesian University of Education, and government of Sumedang Regency (Hendayana, 2006), then followed up by conducted the P-HKI program (Hendayana, 2010).

In the US case, some US lesson study cases presented by The Columbia University Teachers College Lesson Study Group. This group identified central characteristics of participation that limited teachers' learning. When working with Japanese colleagues, U.S. teachers were challenged to find a strong research focus and to stay with the research process needed for lesson study (Fernandez, cited by Hart, Alston, & Murata, 2011).

The U.S. teachers struggled to develop a meaningful research hypothesis, to develop means to explore the hypothesis, to use evidence to make claims, and to generalize the findings. In another study for which U.S. and Japanese teachers were interviewed about their lesson study experiences, the same group of researchers found that U.S. teachers were more likely to describe content goals (e.g., learning how to develop lesson of sphere volume) in disconnect to other goals (e.g., student disposition) and focused heavily on what teachers do in lessons and not on student discovery and autonomy (Fernandez and Cannon 2005). Fernandez also investigated how teachers took advantage of learning opportunities that were created by lesson study (Fernandez 2005), and in the study, the lack of strong mathematics content knowledge and reasoning skills kept the U.S. teachers from taking full advantage of opportunities to learn.

However, the author describes positive outcomes of how the teachers in the study collaboratively anticipated and discussed their students' thinking, revised and taught a lesson multiple times, and reflected on particular aspects of student thinking of mathematics that supported their learning as teachers.

One of the strengths of lesson study is that it places teachers' interests in the center of their learning process. In order for teachers to take full advantage of the opportunities of lesson study, they must be research-oriented and have inquisitive dispositions. However, if the teachers do not have these dispositions (as some research indicates), the dispositions can gradually be developed through participating in the lesson study process. Opportunities provided through lesson study support teachers as they develop knowledge and research skills and engage in future lesson study cycles in more effective and meaningful ways. While it may take longer for beginning lesson study participants to learn to hone in on the critical research process, in most cases, these teachers will become familiar and more adept with these expectations by their second or third lesson study experience. In the meantime, the sense of community and new professionalism will sustain their motivation to participate. Thus, these challenges found in the case studies mentioned earlier may be necessary learning steps for teachers who are for the first time considering teaching as a research process.

Learning from the experiences of the teachers from US and Japan, the teachers of mathematics from Indonesia have eagerness to learn how to conduct lesson study, they were eager to be observed in their teaching of mathematics, so the continuous quality improvement would be the target in teaching mathematics so that the quality of students' understanding would improved.

## 2.2 Teachers experiences as Model Teacher in Open Lesson

Clearly that the lesson study influence one career development as mathematics teacher in Junior secondary school. The duty of mathematics teachers in the lesson study was described in detail, was learned by the teachers. In the pre-implementation, the teachers have to identify the objective of learning, to create the student learning trajectory, or alternative way of solution of the problems, as well as path of learning. The teachers were trained to design the lesson plan, to analyse a minute by minute

students activity, to know student level understanding, and think about how question should we ask for the learner to think critically.

The model teachers got the benefit as they joining the lesson study. They bravely open the lesson, though they do not quite sure whether they teaching was appropriate or not. They thought that if someone else ready to be a model teacher, it means that he or she also is ready to be criticised, would be judged by his or her colleagues and observers. However, in the reality was not. According to RTN (Teacher of SMPN 12), at the beginning I was affraid, worried, and less confident, worried with a making mistake, but after seeing a lot of lesson study we can learn a lot. So I become more confident to be a model teacher of mathematics. My open lesson (RTN, teacher of SMPN 12) was attended by expert from Japan, I have tried to have well prepared lesson plan. Even a profesor from UPI comment “If my mathematics teacher were you, I was sure that my pavorite lesson were mathematics not chemistry as now”.

Similarly, SFN (a teacher from south part of Bandung, students of master degree program) commented “I was doubt, because when I was teaching I did not want to be watched, I was not ready to be criticised, so far I did not like to be criticised. If there was a supervision from the head master or the supervisor, then I felt anxiety. In fact, in the reality, after finishing the lesson almost all the comments were positive. It means that it becomes more confident of myself in conducting teaching when someone else seeing my lesson in the classroom.

A teacher from SMPN Cimahi (SG) as a model teacher also commented:

“...after becoming model teacher in an open lesson conducted in the context of innovation course , I was so fraud and I always be ready to be a model teacher in mathematics classroom. I was not the one who did not want to be observed in my teaching.

The last experience last a couple of month, when the assessor of school came, the assessor asked to come for seeing may lesson. One day earlier, my collegeaus and I was confirmed to be observed our class, no one wished to be observed but me. Generally the teachers did not want their teaching to be observed. In my mind, I have to prepare my self to be observed. In my lesson, when open lesson, I was observed by 20 observers, in this case I would only be visited by 2 persons.

In the previous plan, I would give the test for the students, but because of *assessor* coming, then I have to make plan for the following activities. With the LS experiences, all the preparation can be made. In fact only one visitor (assessor) came to my class. He came to my class whole the time. I now that the assessor was mathematics teacher. The assessor gave very high appreciation to my class presentation. This occation adds experiences for me to be more convenient as a model teacher or as a teacher to be observed in the classroom”.

When a question was addressed to LIA (teacher of SMPN 15 in Bandung) whether Lesson Study useful for her carier “LS useful to make self development, because by joining the lesson study, I can make an innovative lesson plan, not only traditional teaching so my following lesson would be more advance and innovative”. Further more, Lia stated “Prior to learn LS, I have applied such lesson daily, ... but I need more deeply in the teaching model, in the questioning techniques I need to learn more, in learning mathematics content I also need to developed more, in the teaching methods I also need study more”

As model teacher, Lia (sebagai guru model) was aware that she always keep to update knowledge so that the continous quality improvement was still going on. Moreover, Lia expressed “I my mind, with the open lesson, I should change my way of teaching, but the process of change is not as easy as in a night, it takes time, need more persistent, I need to learn more exploration of the content of mathematics as well as methods of teaching mathematics, in other words, I should master in pedagogical content knowledge.

Other experiences was exposed by EhM (one of SMP mathematics teacher) “...one of the most impresive, ... before being a model teacher, I thought that when I became model teacher, I would be affraid, but after joining the lesson study for several times I relised that all my colleagues would fine. ‘Yes, when I became model teacher there were two things, one I should thanks, the other I should thanks to all my colleagues that has observed me, so my first experience I felt stressful, less preparation, and ...nervous, whereas in fact we have done our own teaching for more than ten years, why we should be nervous?

By learning from the open lesson, the more time the more confident in teaching mathematics, the more time I was more

convenient in teaching mathematics. The reflection session, the more time the observer give more polite comments. I can see that the comments from the observer in the reflection session to be more convenient and challenges.

The experiences of teacher model in an open lesson for the first time varied, but most teachers have a positive impression to the open lesson.

### 3. METHOD AND DATA ANALYSIS

This paper uncovers how was the teachers' experiences in the first open lesson. The brief and simple research focuses on the question whether the lesson study give benefit to develop their carrier as mathematics teachers, whether they have no wishes to be observed for the improvement purposes, do they have proud feeling to be observed, are they persons that happy for being published their work through the scientific publication. A question also addressed to model teacher regarding the most constraint to be model teacher of the open lesson and the last question was raised regarding whether they make a discussion at their own school after opening the lesson as model teacher.

Those survey questions were asked to the subjects (six persons) of the study in the written form: three of them are contacted using the essay questions, two of them were sent and asked by mobile phone, and one of them was using email. Results of the survey questionnaire showed that in general the teachers have experiences and knowledge development positively in constructing pedagogical content knowledge.

Result of the survey questionnaires were analysed qualitatively, to have the pattern response pattern that can be interpreted as responden answers, conclusions, and their oppinion as model teacher in an open lesson ocaton. Description of their opinion, and impression were used as a base for their colleagues who want to be model teacher in an open lesson sequences.

### 4. DISCUSSION

After presenting their lesson on the open lesson, the teachers have a number of impression, mostly they have positive comments. It was common when the model teacher has opinion that “If to be a model teacher, when finishing the lesson, then the teacher would be criticised by

observers”. However in the reality not, even a model teacher think the observers usually give a positive impression toward model teachers.

A model teacher (SH) from south part of Bandung mentioned “ I have doubt, teaching is one of profession that I was affraid to be observed, I was worried that my teaching was wrong, I was not ready to be critised. It was worried. When a class suoervision comming to my class, I also be anxious”. Another model teacher, Rtn (one of teacher in the northern part of Bandung City) stated “...I felt have no confidence, I also be affraid when teaching in an open lesson, but this feeling gradually recovery due I often witnessed the model teacher in an open lesson”. EnDH (teacher of SMPN in the center part of Bandung) expressed their experiences as a model teacher “...the first time as model teacher, which was stressful, and make me nervous”. Moreover she stated that in fact there was positive sides: a polite comment from the colleagues in the reflection session, make me more confidence to conduct an open lesson as model teacher, “...whoever to be a mathematics model teacher, in an open lesson, he or she not necessary to feel inconvenient, and feel would be judged by observers”.

After passing a critical time, to be a model teacher at the first time, finally the positive things was coming. “Their self confidence were increased after becoming model teacher of mathematics”. Moreover, the model teacher has positive and constructive comments from the colleagues. After becoming model teacher for the first time, I always ready to be the second time of the model teacher. But I still need more time to learn constructing the lesson plan design”. I still need guidance to make a good lesson plan.

The most and hardest part to be a model teacher were “when preparing our mental and psychological part to be observed by colleagues, it was never been observed before” (SG), for me (RTN) “the hardest part is that my lesson plan, has not perfect yet”. Because the lesson plan has not perfect yet, I feel stressful and nervous when open lesson come”. “I feel not well, feel that I will make wrong, I was not ready to be critised.”

Do they have additional new horizon when they finished open lesson as a model teacher for the first time and do they always discussed the lesson or the issues in the innovation after finishing an open lesson? They giev comments as follows:

SH : I always tried to spend my time for making discussion with my colleagues at

my school about mathematical content as well as mathematics instruction. Sometimes there was very strong debate when we have different opinion in mathematics. It was common for me and I also use the discussion forum for mathematics teacher (MGMP)

SG : I often do my discussion with my colleagues at school, though it was not in the formal situation as in open lesson. I frequently discussed mathematics and mathematics teaching with friends, the issues on the student attitude towards mathematics as well as toward education in general. Discussion in the lesson study setting, give me special experiences for me in deliver the speech as well as deliver the ideas of mathematics for the floor or forum of mathematics group discussion.

RTN : Discussion just one or two, because the full scedule make me so busy, therefore we have difficulty to meet together. There was no MGMP day, as previously we have MGMP day on Wednesday, but not now. Sometimes I throw the ideas “Was there any new ideas regarding our teaching mathematics, please share to us, my question addressed to the teacher of mathematics at school.

EH: At SMP we have a routine discussion of MGMP group people. We allowed the chair of group at school, because the chair person has more and wider horizon of mathematics and mathematics instruction. We really do hope that the human resourses such as lecturers still want to give us more refreshment in mathematical issues, covered by lesson study.

EM : In the activity of the open lesson of the lesson study, we have an efforts to discuss learning plan (lesson plan) that would be presented in the implementation, that would be observed together, and would be revised collaboratively. In my mind, someone cannot play his/her ego. For example “I usually teach using this approach, so in my open lesson I would use this certain approach. In the open lesson we cannot behave such kind of ego”

On the contrary, we should discuss and design the lesson plan collaboratively, so that if we comment to the lesson mean “our lesson, not my lesson”, the false of the syteaxt means “our fault, not my fault”

everything was belong to us, not me. Not only the model teachers, but also us (belong to us me and members of the group). We work collaboratively in discussion of lesson study. Therefore we would improve our practical profession as teacher of mathematics.

From the participants as model teachers we can conclude that at the beginning they have a stressful feeling to face an open lesson, eventhough at the end they tried to dessiminate their result by using discussion as media for scalling up to improve the quality of the lesson. As stated by participant “I spent the time to discuss (SH)”, “I often make a discussion” (SG)”, “Is there any new ideas for discussion please share to us (RTN)”, “We frequently do the discussion among members of MGMP routinely” (EH).

## 5. CONCLUSION AND RECOMMENDATION

Model teacher give an inspiration that naturally a teacher when he/she was teaching can be observed and watched by every body. Because the one who observed the lesson was not allowed to interfere to the students as well as the teacher. Observers could not disturb the teaching process in the classroom. Even, for example just taking the fotograph or video, the cameramen could not block the student sight to the blackboard.

Though the model teacher felt not convenient to be observed, after the action as model teacher, and after the reflection session, the model teachers become more comfortable. At the beginning they feel stressful, being nervous, but post reflection session they feel convenient, their horizon to be opened. Now the model teacher are ready to be a model teacher for the second time, ready to be observed by anybody else. The teacher also be ready their experience to be shared and published, they just have difficulties in writing their research experiences to be an article of the journal. With regard to the most heavy barriers in conducting an open lesson, the teacher mentioned “I have feeling that my preparation has not perfect yet, so I have an effort to make better”.

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## Pengajaran Berdasarkan Aktiviti Drama dalam Meningkatkan Pencapaian dan Motivasi Pelajar Berasaskan ‘Teaching For Real’

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Abstrak:

Drama dalam pendidikan telah bermula apabila anak-anak Queen Victoria dan Albert mementaskan *Athalia* dan beberapa cerita lain. Bermula dari sinilah dikatakan drama telah mula digunakan untuk membantu pengajian bahasa di sekolah-sekolah. Peranan drama dalam pendidikan begitu signifikan berlaku pada pertengahan abad kelapan belas (Zainal Abd. Latiff 1989: 4). Drama – sebuah aktiviti yang melibatkan penggunaan teknik yang luas seperti pergerakan, aksi vokal dan tumpuan mental yang lazimnya kurang menyerlah di dalam kelas tradisional. Pelajar lebih terangsang dan berminat sekiranya aktiviti berdrama dijalankan di dalam kelas. Melalui daya kreativiti guru, pengubahsuaian strategi dan teknik mengajar dapat dilakukan untuk menerapkan aktiviti berdrama dalam pengajaran kita agar ia lebih menarik, bermakna dan membawa kesan yang maksimum, tidak kira apabila berdepan dengan pelajar-pelajar yang kurang motivasi ataupun kurang minat dalam Bahasa Melayu. Kajian ini adalah percubaan untuk menerapkan penggunaan drama dalam mengukuhkan pengajaran bahasa, menyemai sikap suka membaca dan sekaligus menanam nilai-nilai murni melalui karya-karya yang dibaca. Prinsip TEACHING FOR REAL dijadikan sebagai panduan dan sandaran dalam persiapan melakarkan pengajaran menggunakan aktiviti berdrama untuk mencapai objektif pengajaran. Melalui penggunaan drama, pelbagai objektif pengajaran dapat dicapai di dalam kelas Menengah 1, 2 dan 4 yang telah dipilih untuk menjalankan kajian ini. Di antaranya adalah cara berkomunikasi yang lebih berkesan dan meyakinkan, mengasah bakat dan kreativiti, pengaplikasian bahasa dan konsep ataupun pengajaran kefahaman bagi mempersiapkan pelajar untuk peperiksaan.

### 1 PENGENALAN

“Why Don’t Students Like School?” Keputusan akademik yang kurang memuaskan atau rendah. Pelajaran yang membosankan dan membebankan fikiran. Kurang keterlibatan di dalam aktiviti kelas kerana malu dan tidak yakin. Itu adalah di antara masalah mengapa para pelajar tidak berminat untuk bersekolah. Tujuan mereka ke sekolah bukanlah dengan tujuan utama untuk belajar dan membentuk minda mereka, sebaliknya lebih untuk berinteraksi secara santai dengan kawan-kawan. Berdasarkan kajian di dalam buku “Why Don’t Students Like School?”, otak tidak cenderung untuk berfikir dengan sendirinya. Malah, otak mengelak untuk berfikir melainkan di dalam situasi-situasi kognitif yang menggalakkan pemikiran. Pengajaran berdasarkan aktiviti drama dikaji dalam meningkatkan motivasi pelajar dalam pembelajaran Bahasa Melayu. Di dalam kajian ini, pelajar yang mendapat keputusan yang sederhana di dalam Peperiksaan Akhir Tahun 2012, diharapkan dapat meningkatkan prestasi akademik, berkeyakinan dalam pertuturan untuk menyampaikan idea secara berkesan dan keluar dari kepompong rasa rendah diri yang menghambat pembabitan mereka dalam aktiviti di dalam kelas/luar kelas. Aktiviti-aktiviti drama dan teknik dipilih kerana ia adalah wahana

yang sesuai untuk menyatukan emosi pelajar dengan kognitif mereka. Dalam pengalaman mereka melakukan aktiviti-aktiviti drama, mereka mengambil risiko dalam penggunaan bahasa dan merasakan hubungan di antara pemikiran dan kelakuan. Mempelajari Bahasa Melayu melibatkan penimbangan di antara penerimaan pengajaran guru dan mempraktikkan kemahiran-kemahiran bahasa seperti membaca, memahami, bertutur dan menyampaikan buah pemikiran. Penggunaan drama akan dapat memenuhi keperluan ini secara berkesan kerana melalui drama, sesebuah kelas akan belajar menggunakan dan mempraktikkan bahasa serta mengintegrasikan bacaan, penulisan, pertuturan dan pendengaran. Aktiviti berdrama juga akan dapat menimbulkan dan mengekalkan rasa minat pelajar untuk terus melibatkan diri di dalam aktiviti yang dijalankan kerana suasana pembelajaran yang menarik dan penuh dengan elemen hiburan. Dengan itu, perasaan dan perhatian pelajar digait, memperkayakan pengalaman pelajar dalam pembelajaran bahasa ibunda mereka yang semakin menerima tekanan daripada Bahasa Inggeris yang dianggap lebih penting dari segi ekonomi dan penggunaannya yang semakin meluas.

## 2 TINJAUAN BAHAN RUJUKAN

Minda manusia tidak secara alaminya cenderung untuk berfikir kerana berfikir memerlukan usaha, berlaku secara perlahan dan tidak menjanjikan kejayaan. Oleh itu manusia tidak bergantung kepada pemikiran secara sedar tetapi sebaliknya banyak bergantung kepada memori. Walaubagaimanapun, apabila proses berfikir dapat dilakukan dengan jayanya, manusia berasa puas hati. Oleh itu manusia mencari peluang untuk berfikir tetapi, manusia hanya memilih masalah yang memberi cabaran dan pada masa yang sama, dapat diselesaikan dengan jayanya. Untuk memastikan pemikiran yang berjaya, pemikir harus ada maklumat yang secukupnya daripada persekitaran, ruang dalam memori berfikir serta fakta dan prosedur yang diperlukan di dalam memori jangka masa panjang. Teknik menggunakan aktiviti drama diaplikasikan di dalam kelas untuk menggalakkan proses pemikiran di dalam para pelajar. Menurut Sir John Pollock (1958), drama adalah satu pertunjukan yang berlaku penyatuan antara lakonan dan pengucapan atau persembahan gerak laku, serta melakonkan atau meniru watak-watak. Drama harus mengandungi persoalan, tindakan, perkembangan dan klimaks serta kesimpulan. Drama adalah wadah yang baik untuk meneroka aspek teori dan praktikal Bahasa Melayu. Aktiviti berdrama dapat dibentuk untuk membina pengajaran di dalam kelas bagi membina kemahiran berkomunikasi atau selainnya di dalam situasi yang autentik dan dinamis. Dengan menggunakan aktiviti berdrama sebenarnya, pelajar diberikan peluang untuk mempraktikkan Bahasa Melayu dan mengaplikasikan teknik dalam keadaan yang bebas tekanan serta membuat hubungan di antara apa yang baru dipelajari dengan pengalaman pelajar.

## 3 TUJUAN KAJIAN

Aktiviti-aktiviti drama yang bervariasi, menarik, eksperiensial dan visual bentuknya seperti mimos, improvisasi, main peranan, teater bercerita, dikon, simulasi, boneka, teater membaca dapat diolah untuk memenuhi keperluan rangsangan, isu pelajaran, pengukuhan atau pengayaan, pemulihan dan penilaian di dalam sesuatu pengajaran. Di dalam kajian ini, beberapa aktiviti drama seperti bermain boneka(puppet), wayang kulit, lakonan pelajar dan lakonan guru telah diolah untuk mencapai objektif pengajaran akademik bagi persiapan peperiksaan yang diinginkan seperti karangan naratif, pemahaman, peribahasa, dan kata kerja. Pada masa yang sama, objektif pembentukan pelajar yang berkeyakinan dan kreatif dan pandai

bekerjasama dengan anggota yang lain ingin dicapai juga. Justeru, tujuan kajian kami adalah seperti berikut:

1. Mengkaji keberkesanan menggunakan aktiviti berdrama dalam meningkatkan motivasi pelajar mempelajari Bahasa Melayu.
2. Mengkaji peningkatan prestasi pelajar dalam peperiksaan bahasa melayu dengan menggunakan dapatan ujian-ujian kelas serta markah peperiksaan dalam tahun 2012 dan tahun 2013.
3. Meningkatkan keyakinan diri pelajar bagi tujuan meningkatkan keupayaan berkomunikasi.
4. Meningkatkan keupayaan pelajar untuk berfikir secara kreatif dan kritis melalui penulisan.

## 4 PERMASALAHAN KAJIAN

Pelajar menengah 1 dan 2 daripada aliran Ekspres didapati lebih cenderung kepada Bahasa Inggeris kerana Bahasa Inggeris adalah bahasa komunikasi di rumah dan juga pergaulan sosial bagi 90% daripada mereka. Oleh itu, penting bagi meningkatkan minat pelajar di dalam pembelajaran Bahasa Melayu iaitu Bahasa Ibunda yang kian terabai di tengah-tengah kepesatan mencapai kemajuan akademik di sekolah oleh pelajar-pelajar aliran Ekspres.

Bagi pelajar menengah 2 Normal Akademik, mereka lemah dalam kemahiran menjawab peperiksaan kerana, mereka mudah terlupa dan tidak dapat mengaplikasikan kemahiran-kemahiran yang diperlukan bagi menjawab soalan-soalan peperiksaan. Mereka juga bersifat aktif dan tidak cenderung kepada pembelajaran tradisional di mana guru mengajar dan mereka duduk mendengar. Mereka aktif dan berani menyampaikan pendapat.

Lain halnya dengan pelajar 1 Normal Teknikal, mereka lebih cenderung kepada kinestetik dan agak kurang yakin berkomunikasi secara formal dalam bilik darjah. Mereka mudah bosan dengan kaedah pengajaran tradisional yang kadang kala boleh mengakibatkan mereka hilang tumpuan dan minat mempelajari bahasa Melayu. Keupayaan mereka bertutur dalam bahasa Melayu agak baik, namun ada yang memilih untuk berdiam diri sahaja di dalam kelas bahasa Melayu.

Pelajar menengah 4 Ekspres pula, memerlukan banyak latihan dan pengajaran mengimbas kembali untuk mempersiapkan diri mereka bagi peperiksaan yang akan datang.

## 5 KAJIAN LEPAS

Beberapa kajian saintifik telah menunjukkan bahawa drama aktiviti yang kreatif dan berbentuk

instruksional serta pendidikan mempunyai kesan yang positif kepada proses pendidikan secara amnya dan memperkukuhkan pertuturan serta komunikasi. Satu ciri penting dari aspek sosial kemahiran berkomunikasi secara lisan adalah kebolehan memberi ucapan dengan keyakinan dan rasa selesa. Aktiviti berdrama adalah cara yang paling sesuai untuk membentuk keyakinan diri di dalam diri pelajar. Menurut Pietro(1987), pelajar yang lazimnya tidak banyak berbicara lebih cenderung untuk mengambil bahagian di dalam aktiviti yang sedang dijalankan kerana mereka tidak rasa diri mereka digugat oleh guru. Sam (1990) bersetuju dengan menyatakan yang aktiviti berdrama dapat memberi peluang kepada pelajar untuk melibatkan diri secara aktif kerana ia melibatkan pelajar bukan sahaja secara mental tetapi personaliti dan ketrampilan mereka juga. Desiatova(2009) pula menyatakan bahawa manfaat menggunakan teknik serta aktiviti drama amat terserlah kerana menggalakkan pelajar untuk bertutur dan berkomunikasi walaupun mereka mereka mempunyai keupayaan berbahasa yang terhad. Pelajar dapat menggunakan cara komunikasi bukan lisan seperti seperti dari segi mimik muka dan pergerakan badan. Penglibatan pelajar dalam aktiviti berdrama memberikan pelajar peluang untuk melihat perhubungan di antara konteks dan penggunaan bahasa kerana mereka harus memenifestasikan bahasa ke dalam bentuk aksi. Pelajar harus menginterpretasikan makna bagi bahasa itu berdasarkan konteks. Dengan ini pelajar akan dapat menghubungkan bahasa yang telah dipelajari dengan pengalaman mereka tentang dunia (Maley and Duff, 1978)

## 6 KAEDAH KAJIAN

Beberapa eksperimen telah dijalankan untuk meninjau keberkesanan aktiviti dan teknik berdrama di dalam meningkatkan pencapaian serta motivasi pelajar. Kelompok pelajar yang berbeza-beza telah menjalani aktiviti-aktiviti yang bervariasi untuk melihat keberkesanan aktiviti dan teknik berdrama di dalam mencapai objektif yang berbeza. Kaedah berbentuk kuantitatif dan kualitatif diambil bagi menjalankan kajian ini untuk mendapatkan maklumat yang tepat dan benar.

### Subjek Kajian

Ciri-ciri responden bagi tujuan sampling .

- 1 kumpulan kelas menengah daripada 2 Normal Akademik – 32 pelajar yang mendapat gred A1 – B4 pada tahun 2012)

- 1 kelas menengah daripada 2 Ekspres yang terdiri daripada 9 orang pelajar yang mengambil Bahasa Melayu Lanjutan (penguasaan Bahasa Melayu yang agak baik tetapi tidak meminati Bahasa Melayu; lebih cenderung kepada Bahasa Inggeris)
- 1 kelas menengah daripada 4 Ekspres yang terdiri daripada 17 orang pelajar. Prestasi mereka pelbagai terdiri daripada yang lemah (mendapat C6 hinggalah ke A2)
- 1 kelas menengah daripada 1 Ekspres yang berbeza profil pelajarnya (mendapat C untuk PSLE hinggalah ke A\*). 21 orang pelajar – 3 orang pelajar mendapat gred C, 2 orang mendapat A\* dan 16 orang mendapat A.
- 1 kelas menengah daripada 1 Normal Teknikal yang terdiri daripada 22 orang pelajar yang mengambil Bahasa Melayu Asas. Mereka lebih gemar dan selesa berkomunikasi secara santai/tidak formal. Adakalanya perbualan mereka boleh bertukar kepada salah faham dan pergaduhan.

### Instrumen Kajian

Kaedah yang berbeza-beza digunakan terhadap kelompok pelajar yang beza-beza. Kaedah yang telah digunakan ialah:

1. Pemerhatian / Teori Grounded  
Pencerapan reaksi pelajar oleh guru pengkaji bagi tujuan mengukur minat dan penglibatan pelajar di dalam aktiviti yang telah digubal.
2. Temu bual  
Menemubual pelajar selepas persembahan mereka untuk mendapatkan maklumbalas pelajar tentang aktiviti yang telah dijalankan.
3. Analisis Data  
Perbandingan markah peperiksaan yang dijalankan pada tahun 2013 dilakukan untuk ketiga-tiga kumpulan dengan menggunakan aktiviti-aktiviti berdrama bagi mengkaji peningkatan dalam pengaplikasian kemahiran-kemahiran yang diperlukan untuk para pelajar kuasai bagi tujuan peperiksaan. Format-peperiksaan tidak diubah bertujuan untuk menguji kebolehan pelajar mengaplikasi kemahiran.
4. Rujukan  
Rujukan internet melalui komputer juga dijalankan untuk mendapatkan maklumat tambahan bagi menggubal pengajaran yang

sesuai untuk memenuhi objektif pengajaran yang ingin dicapai.

### Prosedur Kajian

#### Eksperimen 1:

Subjek bagi eksperimen ini adalah 9 orang pelajar daripada menengah 2 Ekspres. Walaupun mereka mengambil Bahasa Melayu Lanjutan, mereka masih belum dapat menggarap kemahiran menjawab soalan kefahaman. Pemahaman terhadap sesuatu teks juga masih boleh diperbaiki kerana mereka membaca sesuatu teks secara keseluruhan sahaja dan tidak berupaya untuk membuat rujukan inferens terhadap teks itu. Mereka juga lebih selesa bertutur di dalam bahasa Inggeris. Ujian diagnostik dijalankan dan 7 orang gagal di dalam ujian itu. Dua orang lulus tetapi hanya seorang sahaja yang lulus dengan cemerlang. Oleh itu, bagi mendapatkan pemahaman pelajar terhadap teks, guru pengkaji telah menggubal sebuah pengajaran di mana pelajar-pelajar dikehendaki untuk menghidupkan teks itu secara berkumpulan dengan melakonkannya.

Pelajar-pelajar dikehendaki untuk memikirkan dan mengekspresikan mimik wajah, gerak-geri dan juga latar susunan props. Guru tidak akan membantu sekadar memberikan pembayang dengan membacakan ayat-ayat di dalam teks untuk pelajar fikirkan dengan lebih mendalam cara untuk mengekspresikannya dengan lebih baik. Percubaan pertama pelajar tidak begitu berjaya kerana terdapat banyak aspek teks itu yang tidak diungkapkan secara eksplisit ataupun implisit. Setelah mendengar teguran guru, percubaan pelajar yang kedua berjaya dari segi ketepatan dengan teks serta inferens yang bernas berdasarkan konteks. Pelajar dapat menjawab soalan-soalan berdasarkan teks yang berasaskan Blooms Taksonomi dengan baik termasuk soalan yang memerlukan daya pemikiran yang lebih kritis. Jawapan mereka dapat diperkukuhkan dengan bukti walaupun tanpa bimbingan guru. Pemahaman pelajar telah ditingkatkan dengan aktiviti melakonkan teks itu. Guru pengkaji mengingatkan pelajar untuk mengimajinasikan apa yang mereka baca di dalam minda sehinggalah kepada butiran yang terkecil untuk membantu meningkatkan pemahaman.

Ujian 1 adalah ujian yang menggunakan teks yang mempunyai tema serupa dan jenis soalan-soalan yang serupa dengan ujian diagnostik. Ujian kedua dijalankan menggunakan teks yang mempunyai tema yang berbeza tetapi soalan yang serupa. Ujian ketiga pula dijalankan pada jangka waktu yang agak jauh daripada aktiviti drama yang telah dijalankan di penggal 1 bagi melihat sama ada

pelajar dapat mengekalkan apa yang telah mereka pelajari.

#### Eksperimen 2:

Subjek bagi eksperimen kedua ini pula adalah 17 orang pelajar daripada menengah 4 Ekspres yang terdiri daripada mereka yang mempunyai kebolehan yang pelbagai. Para pelajar didapati masih tidak dapat menguasai penulisan karangan naratif dengan baik. Karangan mereka hambar dan tidak diaplikasikan dengan teknik-teknik karangan naratif yang dapat mempertingkatkan mutu karangan naratif pelajar menjadi lebih baik. Aktiviti berdrama yang telah guru pengkaji pilih untuk menggalakkan pelajar mengaplikasikan teknik-teknik karangan naratif adalah lakonan guru.

Bagi kajian ini, para pelajar menengah 4 Ekspres telah menghadiri Seminar Bimbingan Persiapan Peringkat 'O' yang telah dianjurkan oleh sekolah-sekolah Kelompok Barat 2. Guru pengkaji yang juga guru bertanggungjawab membentangkan tentang karangan naratif telah beraksi dengan menghidupkan karangan dengan lakonan secara individu melalui teknik-teknik penulisan yang sesuai. Para pelajar telah mengambil bahagian dalam aktiviti amali yang juga diadakan di dalam sesi itu iaitu mereka mengaplikasikan teknik-teknik yang sesuai untuk menghidupkan sesuatu konflik. Beberapa kumpulan juga telah terpilih untuk melakonkannya.

Setelah sesi seminar itu, pengajaran usulan telah dijalankan di mana para pelajar diingatkan semula tentang teknik-teknik yang harus mereka fahami dan aplikasikan dalam karangan mereka. Beberapa orang telah dipilih untuk membaca penulisan mereka yang kini sarat dengan teknik-teknik penulisan yang sesuai menggunakan intonansi suara yang sesuai dan gerak-geri badan yang sesuai.

Dalam pengajaran yang seterusnya, pelajar dikehendaki menulis sebuah karangan naratif menggunakan teknik-teknik penulisan yang sesuai. Sebab aktiviti bercerita ini dipilih adalah untuk membuktikan kepada para pelajar bahawa teknik penulisan adalah penting untuk diaplikasikan ke dalam karangan naratif kerana bisa menghidupkan karangan itu. Pelajar juga lebih memahami cara dan bila untuk menggunakan teknik-teknik karangan naratif yang sesuai kerana mereka akan membaca tulisan mereka sendiri untuk mendapatkan kesan yang mereka kehendaki. Dalam pengajaran seterusnya, guru membawa pelajar untuk mendapatkan inspirasi bagi mengolah plot karangan naratif yang menarik.

**Eksperimen 3:**

Eksperimen yang ketiga ini melibatkan kumpulan pelajar menengah daripada aliran 1 Ekspres yang mempunyai penguasaan Bahasa Melayu yang berbeza-beza. Mereka lebih selesa berkomunikasi di dalam Bahasa Inggeris berbanding dengan Bahasa Melayu. Aktiviti berdrama ini adalah amat sesuai bagi menggalakkan pelajar-pelajar ini berjinak-jinak menggunakan bahasa melayu di dalam pertuturan dan meningkatkan motivasi mereka untuk mempelajari bahasa melayu.

Bagi kajian ini, guru menggunakan aktiviti-aktiviti yang berbeza bagi mencapai objektif pengajaran yang berbeza. Aktiviti berlakon menghidupkan boneka (puppet) digunakan untuk mengajar peribahasa. Daripada pemerhatian guru pengkaji, pelajar-pelajar begitu ghairah untuk menggunakan boneka-boneka itu. Mereka diberi dua peribahasa dan harus menggunakannya di dalam dialog di antara watak-watak boneka yang telah mereka pilih. Mereka begitu tekun membuat perbincangan merancang dialog mereka dan menyelitkan peribahasa yang harus mereka aplikasikan. Mereka juga berlatih menggunakan boneka. Sewaktu persembahan berkumpul, guru pengkaji mendapati bahawa para pelajar bersungguh-sungguh melakonkan boneka mereka. Suara mereka diubah mengikut boneka yang telah mereka pilih. Contoh, suara yang tinggi dan lembut untuk boneka arnab dan suara yang garau untuk boneka musang. Walaupun kadangkala perbincangan dijalankan dalam Bahasa Inggeris tetapi mereka berusaha untuk menggunakan Bahasa Melayu apabila diingatkan guru pengkaji.

**Eksperimen 4:**

Subjek bagi eksperimen ini adalah 32 orang pelajar daripada menengah 2 Normal Akademik. Walaupun mereka sudah dua tahun mempelajari bahasa Melayu di peringkat sekolah menengah, mereka masih belum dapat menggarap kemahiran menjawab soalan peperiksaan khasnya bahagian penulisan. Kemahiran yang diajarkan sering mereka lupa, lebih-lebih lagi setelah peperiksaan Semestral. Ujian penulisan menunjukkan mereka kurang dan ada juga yang tidak mengaplikasi segala teknik penulisan yang diajarkan. Guru pengkaji telah menggubal sebuah pengajaran di mana pelajar-pelajar dikehendaki untuk menulis dialog yang diubah kepada skrip lakonan dan menghidupkan suasana bersesuaian dengan tema secara berkumpulan dengan melakonkannya.

Dengan tema Kebersihan Persekitaran (Akibat Kecuaian Kita) pelajar-pelajar dikehendaki untuk memikirkan jalan cerita yang bertepatan dengan tema dan tajuk persembahan. Mereka harus

memastikan ada perkara-perkara penting yang guru tetapkan di dalam persembahan mereka itu. Dua perkara penting itu adalah perkataan-perkataan yang berimbuhan 'meN....kan' dan peribahasa yang bersesuaian dengan topik. Pelajar digalakkan memberikan perhatian kepada mengekspresikan mimik wajah, gerak-geri dan juga latar susunan props. Guru sekadar memantau gerak kerja pelajar dan memberikan tip-tip jika pelajar perlukan. Percubaan pertama pelajar berlakon pernah di jalankan dengan bantuan skrip drama radio. Tetapi kali ini mereka menulis skrip mereka sendiri, mengarah lakonan mereka sendiri dan juga menyediakan prob yang mereka perlukan. Pelajaran tersebut telah dapat dijalankan dengan berjaya dan berkesan di mana pelajar yang menonton persembahan kumpulan dapat mengenalpasti perkataan-perkataan berimbuhan 'meN...kan' dan peribahasa yang digunakan berdasarkan tema dan tajuk, dengan melengkapkan lembaran kerja yang diberikan. Aktiviti ini diperkukuhkan lagi dengan latihan susulan iaitu menulis laporan( sebagai seorang pemberita) bagi salah satu isu yang dilakonan pelajar-pelajar. Tugas menulis ini dapat mereka selesaikan di rumah dengan baik walaupun tanpa bimbingan guru. Kebolehan pelajar menulis telah ditingkatkan dengan aktiviti lakonan dalam kelas itu.

Sesi berdrama ini telah mendapat perhatian semua pelajar termasuk mereka yang sebelum ini agak pasif di dalam kelas. Mereka mengambil masa dua hari untuk menulis skrip serta berlatih drama hasil tulisan mereka sendiri.

**Eksperimen 5:**

Eksperimen yang terakhir ini melibatkan kumpulan pelajar menengah daripada aliran 1 Normal Teknikal melalui aktiviti komunikatif bertemakan Budaya Melayu yang dijalankan selama dua minggu. Projek kumpulan ini bertemakan Warisan Seni Pentas: Wayang Kulit. Pelajar diberi maklumat mengenai jenis-jenis wayang kulit, asal usulnya dan juga watak-watak wayang kulit. Mereka dikehendaki melukis dan mewarnakan serta memotong patung wayang kulit pilihan mereka. Menyusuli aktiviti itu, pelajar diminta menjadi dalang hanyak membawakan satu watak. Aktiviti berdrama ini adalah amat sesuai bagi menggalakkan pelajar-pelajar ini berjinak-jinak menggunakan bahasa melayu yang sempurna di dalam pertuturan dan meningkatkan motivasi mereka untuk menggunakan bahasa melayu secara formal.

Bagi kajian ini, guru menggunakan aktiviti-aktiviti yang berbeza bagi mencapai objektif pengajaran yang berbeza. Aktiviti berlakon menghidupkan patung wayang kulit digunakan

untuk mengajar pelajar bertutur dengan sopan dan gramatis. Daripada pemerhatian guru pengkaji, pelajar-pelajar begitu ghairah untuk menggunakan patung-patung tersebut. Mereka diberi peluang berlakon secara spontan kerana kebolehan menulis pelajar golongan ini agak terhad. Mereka begitu tekun membuat patung-patung dan merancang dialog mereka dan menyelitkan isu-isu masakini yang harus mereka aplikasikan, contohnya tentang kebersihan dan kesihatan. Mereka minta untuk berlatih menggunakan patung-patung wayang kulit. Sewaktu persembahan berkumpul, guru pengkaji mendapati bahawa para pelajar bersungguh – sungguh berlakon. Suara mereka diubah mengikut watak yang telah mereka pilih. Jelas pelajar kita walau dari aliran apapun sangat kreatif.

## 7 DAPATAN KAJIAN DAN PERBINCANGAN

Eksperimen 1:

Jadual 1: Berikut adalah dapatan daripada ujian-ujian yang telah dijalankan.

Rata-rata terdapat peningkatan dari segi prestasi pelajar di dalam ujian-ujian yang seterusnya.

SUMBER DATA	Jumlah Jawapan (Ujian 1) 11/30 mata	Jumlah Jawapan (Ujian 2) 11/30 mata	Jumlah Jawapan (Ujian 3) 11/30 mata	Jumlah Jawapan (Ujian 4) 11/30 mata
1. NUR SUCILLAS	15	17	16	17
2. QALBIAH ESTRIYSA	7	15	15	20
3. CHURISTALAIN	24	27	27	26
4. NUR NABILAH	8	17	18	18
5. NUR FIZAH	12	14	15	18
6. NUR FARHA	14	21	16	14
7. SITI NUR SYARAH	9	13	13	14
8. LULIA WAH	12	12	14	17
9. NURAZAH BANTAL	12	15	16	17

Walaupun terdapat penurunan dari segi kualiti kelulusan di dalam ujian keempat, tetapi ia tetap lebih baik daripada ujian pertama pelajar secara amnya. Penurunan dari segi kualiti markah itu mungkindisebabkan jarak masa yang agak jauh daripada pengajaran yang telah dijalankan dalam penggal sebelumnya. Walaubagaimanapun, pelajar masih dapat terus untuk mengaplikasikan penghidupan imaginasi mereka walaupun memerlukan aktiviti mengimbas kembali. Daripada pemerhatian guru pengkaji, pelajar-pelajar didapati mencuba sedaya-upaya untuk bekerjasama di antara satu sama lain bagi menghasilkan sebuah sketsa yang tepat mengikuti jalan cerita seperti yang terparap di dalam teks itu di dalam pengajaran menggunakan drama. Pelajar juga didapati lebih memahami sesebuah teks selepas pengajaran itu dijalankan.

Eksperimen 2:

Dalam latihan sesi amali di dalam seminar, pelajar dapat menghidupkan sebuah konflik dengan menggunakan teknik. Cara pelajar menceritakan perenggan karangan mereka juga baik kerana mereka cuba untuk menjadikan cerita mereka menjadi lebih menarik. Rasa malu dapat diketepikan kerana guru pencerita yang bercerita dengan mimik muka, gerak-geri badan serta intonansi suara yang sesuai menjadikan suasana tidak mengugut pelajar malah mendorong mereka untuk sama memberikan yang terbaik. Guru pengkaji juga telah mendapatkan pendapat pelajar dan guru-guru yang hadir di dalam seminar itu untuk memberikan komen tentang aktiviti bercerita yang dijalankan. Para pelajar menyatakan bahawa bahagian pembentangan karangan naratif adalah yang paling menarik dan mereka tidak berasa mengantuk sepanjang pembentangan. Mereka juga menjadi ghairah untuk mencuba teknik-teknik yang baru dikongsikan di dalam karangan mereka. Guru-guru yang hadir juga memberikan maklumbalas yang serupa menyatakan bahawa mereka terhibur dengan pembentangan yang berbentuk bercerita itu.

Di dalam aktiviti pengajaran susulan, pelajar dilatih untuk menggunakan teknik-teknik yang sesuai bagi menyampaikan beberapa konflik. Pelajar sudah semakin terbiasa menggunakan teknik-teknik karangan naratif. Pelajar-pelajar juga kini sudah semakin bersedia untuk menulis sebuah karangan naratif yang lengkap. Pelajar berusaha untuk memikirkan sebuah jalan cerita yang bukan sahaja menarik tetapi pada masa yang sama memenuhi keperluan soalan. Rata-rata ke semua pelajar telah mencuba untuk mengolah plot cerita mereka dengan menyelitkan teknik-teknik penulisan karangan naratif yang sesuai. 15 orang pelajar telah berjaya meraih markah melebihi 26 mata daripada 40 mata markah penuh.

Eksperimen 3:

Bagi eksperimen ini, guru pengkaji mendapati bahawa para pelajar berusaha bersungguh-sungguh untuk mencapai objektif pengajaran dengan merancang dialog mereka. Walau bagaimanapun, ada dua kumpulan yang menginterpretasikan makna peribahasa dengan tidak tepat. Guru pengkaji terpaksa memberi maklumbalas dan membetulkan interpretasi pelajar yang tidak tepat itu dan memberikan saranan yang lebih baik bagi mengaplikasikan peribahasa itu di dalam bentuk dialog. Daripada pemerhatian guru, pelajar didapati begitu khusyuk membuat perancangan dan melakonkan watak-watak boneka mereka. Namun di dalam keghairahan mereka, aspek interpretasi peribahasa dengan lebih tepat diabaikan.

Eksperimen 4:



Guru pengkaji dan guru-guru yang diundang menghadiri sesi persembahan ini mendapati bahawa para pelajar berusaha bersungguh-sungguh untuk mencapai objektif pengajaran dengan merancang skrip dan lakonan mereka. Persembahan mereka itu telah diadili dan kumpulan yang menang telah diberikan hadiah. Guru yang menjadi pengadil memberikan maklumbalas yang sangat positif dan menggalakkan kerana pelajar kelihatan begitu yakin dan seronok berlakon. Walaupun ada kumpulan yang kekurangan jumlah pelakon hari itu, mereka tetap dapat mengahasiq persembahan yang baik dengan membuat pengubahsuaian secara automatik. Maklumbalas pelajar juga menyatakan mereka sangat seronok berlakon dan telah memahami topik tatabahasa yang diberikan dengan lebih baik. Mereka juga dapat mengenalpasti peribahasa-peribahasa yang sesuai dengan situasi.

**Eksperimen 5**

Jadual 2: Sikap dan Minat Pelajar Normal Teknikal terhadap Pengajaran dan Pembelajaran Bahasa Melayu yang mengaplikasikan teknik drama

Daripada eksperimen ini, guru pengkaji mendapati bahawa pelajar Normal Teknikal lebih cenderung dan aktif dalam kerja-kerja tangan.

No.	Terdapat	Sikap		TMS/Sikap	
		Berkaitan	Peratus	Kekurangan	Peratus
1.	Kamu akan membuat persembahan drama menggunakan konsep persembahan bahasa Melayu	23	99	0	0.0
2.	Saya telah menikmati dan memahami maklumbalas yang diberikan oleh guru	18	81.8	4	18.2
3.	Alasan yang saya berikan untuk membuat persembahan bahasa Melayu	18	81.8	4	18.2
4.	Saya akan membuat persembahan bahasa Melayu apabila saya telah selesai belajar	18	81.8	4	18.2

Mereka sangat tekun berusaha untuk mencapai objektif pengajaran dengan menyiapkan patung-patung yang berwarna-warni dan merancang lakonan mereka. Walaupun ada kalanya perkataan yang mereka ujarakan agak kurang memuaskan, mereka sedia mendengar teguran dan cuba memperbaiki lakonan mereka dengan meminta untuk membuat persembahan kali kedua. Guru menggalakkan pelajar berusaha lagi untuk memberi mereka peluang kedua dan lebih bersemangat untuk belajar bahasa Melayu.

Dapatan daripada pemerhatian turut serta oleh pengkaji juga mendapati murid-murid menunjukkan riak muka yang ceria dan gembira semasa sesi pengajaran dan pembelajaran berjalan. Keadaan ini sedikit sebanyak mencerminkan perasaan dalamannya yang cukup seronok dan gembira mengikuti kelas tersebut.

**Keseluruhan**

Secara keseluruhannya seperti yang disarankan daripada pembacaan mengenai penggunaan teknik-teknik dan aktiviti-aktiviti berdrama ini, seni

persembahan yang mencakupi aktiviti bercerita, lakonan pendek dan bermain boneka membolehkan peserta menguji pencapaian intelek, emosi dan nilai hidup mereka. Selain itu, pelajar juga dapat meluahkan pernyataan perasaan seperti marah, kasih, suka dan duka selain dapat memperlihatkan kreativiti. Ciri-ciri sedemikian dapat dieksploitasikan melalui aktiviti yang dijalankan semasa proses pengajaran dan pembelajaran teknik berdrama untuk mencapai objektif pengajaran akademik yang berbeza-beza sesuai untuk persiapan peperiksaan dan mengaplikasikan kemahiran-kemahiran yang diperlukan di dalam peperiksaan. Murid-murid juga diberi peluang untuk mengembangkan potensi diri melalui medium seni persembahan. Mereka juga kini lebih berkeyakinan untuk membuat persembahan di depan khalayak.

Kemahiran berfikir secara kreatif dan kritis memerlukan pemikiran bercapah yang bergantung kepada pengetahuan dan pengalaman peribadi pelajar. Kemahiran yang dimaksudkan merangkumi kemahiran menilai, membuat kesimpulan, menghayati dan mengesan pengajaran. Melalui teknik mengalami, menghayati yang dilakukan oleh pelajar dalam aktiviti berdrama, ternyata menyerlahkan kemampuan berfikir secara kritis dan kreatif. Hal ini sekaligus membuktikan bahawa peningkatan penguasaan kemahiran berbahasa dalam kalangan pelajar boleh dipertingkatkan melalui amalan pengajaran dan pembelajaran yang mengaplikasikan teknik berdrama.

**8 KESIMPULAN**

Pelajar memerlukan pengajaran dan pembelajaran yang dapat mencungkil bakat mereka, yang melibatkan bukan sahaja minda mereka, tetapi juga perasaan dan emosi mereka untuk mengekalkan objektif pengajaran yang ingin dicapai. Selain daripada membina diri mereka dari segi akademik dan pemikiran mereka untuk menjadi lebih kreatif dan kritis, kemahiran-kemahiran yang diperlukan dalam abad ini, pelajar juga memperkasakan diri mereka dengan keyakinan diri dan keberanian mengambil risiko dalam mencapai sesuatu objektif. Oleh itu, jelaslah daripada perbincangan di atas, sesuatu pengajaran yang direka dengan baik dan teliti menggunakan teknik berdrama akan dapat mencapai hasil yang diinginkan dalam diri pelajar. Guru itu sendiri harus berani mengambil risiko dan mengetepikan rasa malu yang mencengkam diri kerana guru sebagai pemudahcara juga harus memaparkan pengaplikasian teknik berdrama di dalam pengajaran mereka untuk menimbulkan sesuatu suasana pengajaran yang dirasakan selamat dan menggalakkan pelajar untuk mencuba sesuatu yang baru tetapi menarik dan menghiburkan.



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## ***Building Learning Community through Lesson Study Approach During Practical Teaching***

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**Abstract:** Lesson study gives opportunities to learning community as well as collaborative and long learning process to enhance teachers' knowledge and sharing experiences. The learning community gives big impact in lesson study approach by collaboration, discussion and reflection to enhance the development of teaching and learning process. The collaboration happens in four steps which are preparing lesson plan, teaching action, reflection and modification of teaching based on the reflection. The power of the Lesson Study in developing teaching quality should be exposed to teachers training. Therefore, this article aim to discuss how to build teaching community during teaching practical in school. Five teachers training were involve in this study. They were supervised by four lecturers who implemented lesson study approaches during practical training in school. The discussion focus on the building of the lesson plan community and the evaluation community throughout the Lesson Study approach during practical teaching. The involving of the communities in practical teaching give impact on effective teaching experiences especially pedagogical content knowledge and all elements of teaching and learning processes. For this purpose, the quality of education could be increase even though they are still new in teaching profession.

**Keywords:** Teaching Community, Lesson Study, Teachers Training, Teaching Profession, Lesson Plan.

### **1. INTRODUCTION**

Generally, the quality of education is largely determined by the quality of the students produced in the education system. The quality of students is determined by the quality of teaching in a holistic manner. To determine the quality of teachers, several strategies have been implemented by the Ministry of Education through a variety of initiatives under the Teacher Education Division and Curriculum Development Division that directly involved in the teaching professionalism. Among the initiatives was the creation of a Professional Learning Community (PLC).

Teachers need to constantly improve their knowledge, to make changes and try to improve their teaching approaches because the dynamical nature of education. The world is changing so rapidly, these changes affect knowledge in education, student thinking, technology, and ultimately to create diverse student groups. In short, sustainability in teacher education needs to grab the attention of all parties and should be planned in the education system. Thus, professional learning

communities established in the education system to help teachers to improve the quality of teaching and learning while helping students in the education system at the school. The PLC is one of the approaches to enhance the professional development of teachers in the teaching process. Classroom is a learning platform for students to be protected and used wisely to nurture and development of the various elements of education. Classroom also is the place of teaching and learning to achieve the educational goals of producing students who are integrated in terms of physical, emotional, spiritual and intellectual. The success of this goal will be visible when the quality of teaching and learning processes can be created and activated by the teachers either in or outside of classroom. This can be accomplished through the Lesson Study approach, which focuses specifically on the process of teaching and learning in the classroom. In this case, the quality of teachers should be stimulated so that their teaching motivation retain during their service. Therefore, the evaluation must be collaboratively done so the teaching processes become more widening and shared.

In Malaysia, the lesson study was introduced in 2011 with a total of 289 schools are involved directly (Ministry of Education, 2012). It is a sharing platform in promoting collaboration and discussions through social interaction. This partnership is expected to develop teachers' knowledge related to student learning that stimulates the development of teaching practices. In addition, the implementation of lesson study provides the space and opportunity to create a learning community of teachers for a collaborative partnership to improve student's learning and skills development. In fact, the goals set in the lesson study allow teachers to determine the best steps to improve their teaching practices. The strategies in lesson study can be used to produce new ideas in teaching and learning that based on initiative being set to understand student thinking (Yoshida, 2002). In addition, professional learning communities provide opportunities for teachers (a) to identify the appropriate issues that enhance the learning of students and teachers, (b) to share experiences in the classroom with a group of students, (c) to identify issues of equality and equity, (d) to allow teachers to learn, implement teaching and improve student's performance in the classroom (West - Olatunji, Behar - Orenstein, & Rant, 2008).

In this case, the PLC through implementing Lesson Study approach has been pioneered in the education system in Japan. This approach is expected to change the individual method of teaching the into a form of partnership, discussion and collaboration with a learning community. In the implementation of lesson study, the challenge is to create a culture of learning communities to achieve collaborative discussion, cooperation and partnership. With the open collaboration in implementing the lesson study, teaching assessment will be more holistic and detailed. Hence, this study aims to discuss how we can build community involvement in the implementation of lesson study and how the assessment was done by the learning community during the practice teaching.

## 2. PRACTICAL TEACHING

The practical teaching undertaken in the context of classroom instruction for 16 weeks in normal school. Student teachers were required to teach between 10-12 hours a week along one semester. Also, the practical teachers must write a daily teaching and learning plan according to the format prescribed by the faculty with the addition, where necessary according to the situation and specifications subject and school. During the teaching practical, student

teachers were supervised at least three times by supervisors and mentors. In addition to teaching, student teachers were necessary to involve a program organized by the school, such as extra-curricular activities, sports, society, school uniforms and other school activities.

The focus during the practical teaching was the assessment. Formal assessment conducted by lecturers and mentor in school. Mentors are appointed by the school administration based on major and minor specialization taken by student teachers. The assessment was done holistically, not only during the teaching and learning in the classroom, but also the involvement of student teachers in other school activities. However, in this research, lesson study focused on the classroom assessment and how to build the community of evaluation during practical teaching.

## 3. LESSON STUDY

Lesson study is a term introduced by means of learning in the classroom instruction process. In other words, it is related to studies involving observation of the learning process in teaching. Generally, there are four steps introduced in the implementation of lesson study: identify problems and goals, building lesson plan, classroom instruction and reflection. In this case, the teachers can learn with the learning community for planning and evaluating the process and steps involved in the classroom instruction.

In Japanese, lesson study is known as "Jugyokenkyu" which is meant "the study of teaching". The term was introduced by Makoto Yoshida, who is an expert and has vast experience in the field (Wiburg & Brown, 2007). Lesson study is an approach in conducting a research on teaching in the classroom. This approach is used to explore the development of student learning at a deeper and meaningful stage that emphasizes the learning process. Lesson study is a continuation of collaborative teaching methods and has its own characteristics (Mohamed Naim Daipi, 2009). In Japan, student teachers have been exposed and are directly involved in lesson study during their learning preparation to become teachers (Wiburg & Brown, 2007). From the aspect of teaching, when lesson study is carried out in the classroom, it can enhance the teachers' learning experience in the various aspects of teaching and to improve their teaching ability. However it does not marginalize the importance of student learning during the teaching process. This is because the assessment and

reflection of each lesson is not only focused on the teacher, but also the development of student learning. In addition, the lesson study approach can be used to explore teachers' ideas to enhance critical and creative thinking, to help each other find solutions to a problem and to expand the understanding, skills and abilities of teachers and students.

### 3. COMMUNITY LEARNING THROUGH LESSON STUDY

The implementation of lesson study involves several teachers in a teaching session. The teachers work collaboratively for each lesson that starts from defining the objectives of the teaching up to the reflection. The first step in the lesson study is the teachers discuss and specify learning objectives appropriate to the target students. The objectives of the content should not be too much for the students to understand and to be taught effectively. Utilizing a student-centred teaching approach is recommended so students can actively participate and fully involve

The second step, teachers collaboratively build a complete lesson plan for teaching. This partnership is expected to generate more brilliant ideas, which resulted in an interesting lesson plan. In this step, a teacher will use the lesson plan as guidance to teach in the classroom. Other teachers will monitor and evaluate the instruction. This group of teachers will understand better the content of teaching because the lesson plan was prepared by them. Thus, observations of student responses will be improved. After completion of the lesson, all teachers will reflect on the instruction and discuss to see the strengths and weaknesses of the process so that changes can be made to improve the teaching plan. Furthermore, the following classroom instruction can be taught with reference to the improved and developed teaching plan.

The applications of lesson study in teacher training is an innovation to improve the quality of instruction during the teaching training especially when assessing the teaching capability. Figure 1 shows the steps in the implementation of lesson study in the practical teaching.

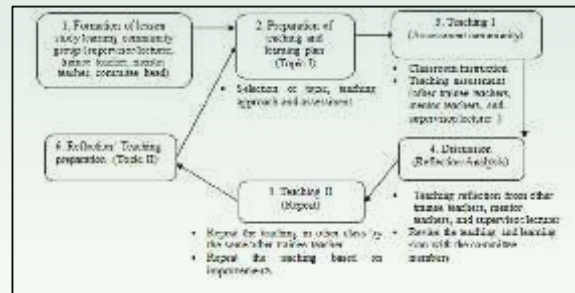


Figure 1. The Implementation of Lesson Study Model in Practical Teaching.

Based on Figure 1, the implementation process of lesson study is consists of six steps. Learning community is formed through a collaborative engagement between the lecturers and mentors. Fernandez and Yoshida (2004) involved in collaboration with experienced teachers, education professors and mentor teachers from the university in the field of education, as well as other educators. In fact, lesson study is a medium of teacher development that can help new teachers and senior teachers to create meaningful experience from the teaching communities (Fernandez, 2005). Learning communities have become a culture in the Japan education system and the most popular when the community group is formed in the school itself.

### 4. METHOD

The study involved five particle teachers who were teaching in schools under the supervision of four lecturers. These practical teachers utilized lesson study approach in their classroom. Data were collected through practical teacher reflective journals, observations and interviews. Practical teachers had undergone the teaching training at the selected schools for 16 weeks. Each of them trainee was required to establish a community group to attend the open class to share and assess the instruction.

### 5. RESULT AND DISCUSSION

Professional learning communities are able to make a difference to the students and teachers in the teaching and learning process. Taylor et al. (2005) suggest that teacher learning either individually or collectively is tested in a professional learning community. In fact, it is an indicator of academic development. The features of learning in a community include (a) learning various techniques and teaching strategies, (b) active learning provides

space for social learning, (c) the interaction of teachers and students, (d) the continuation collaboration of the teacher and students outside of class increases with the support of collaborative learning culture within the school, and (e) the norms of the school organization is compiled in learning partnerships rather than isolation.

The implementation of lesson study involves a group of teachers who collaborate to create a lesson plan based on the goals that have been agreed upon. Then, the group makes some teaching observations at one of the teachers who use the created lesson plans. After the first lesson, teachers can make changes to the teaching that has been designed by improving and establishing a new teaching plan. After that, the second teaching session conducted based on the new lesson plan. Observations were made on the second lesson delivered by a different teacher from the first lesson, and then discussion will be carried out again by making some reflection on the second lesson. The discussion will identify the strengths and the changes that need to be done if the next instruction is executed (Fernandez & Yoshida, 2004).

This study focused on the formation of learning communities in the implementation of lesson study and the overall assessment of practical training. This part will discuss on the establishment of a community group during practical training. At the initial stage, the challenges in the implementation of lesson study was the formation of learning communities. The integration of lesson study approach during the teaching training began with collaborative discussions to develop lesson a study community. Based on the analysis of the observations, lesson study communities were formed from two groups, lesson study learning community and research community. Figure 2 shows a model of community formation in the integration of lesson study during the teacher training.

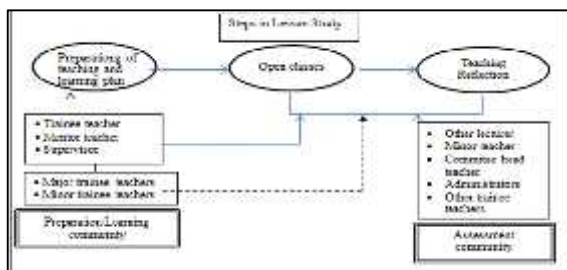


Figure 2. Community involvement in lesson study.

Based on Figure 2, the major steps in the implementation of lesson study are the preparation of teaching and learning plan, teaching open classes

and reflection of teaching. Learning communities can be divided into two groups: 1) learning community group and 2) assessment community group. The learning community involved in all major steps of the lesson study model. Meanwhile the research community is the community involved in the observation and discussion of teaching reflection.

### 5.1 Learning communities of lesson study group (LCLS)

Students in Education program have been placed in schools for practical teaching in a final year. The students have been determined by the university management to take into account the needs of the placement at the selected schools. Placement of students in schools was done either in a program (same specialisation) or different programme to provide opportunities for collaborative discussion among themselves. However, there were other students from sport sciences, Islamic education, special education and teaching English as a second language (TESL) that being placed in the same school as required by the school management.

The trainee teachers attended the same activities as other teachers while in school. They were given a timetable to take over the classes of two senior teachers according their major and minor specialisation. The senior teacher with the major specialisation was appointed as a mentor to the trainee teacher. In this situation, the learning community was created which comprised of trainee teacher, mentor teacher, supervisor and other trainee teachers from major and minor field . The group consists of members, who have similarities in terms of specialization. Therefore. This group to provide the input in developing lesson plan.

### 5.2 Assessment Community Group (AC)

The second group of learning community is assessment community (AC). This froup consists of those who were willing to engage in the observation during the teaching process. The lesson study approach provided an opportunity for the involvement of the various parties who have a relationship with the education to be presented in the open class. In the context of teaching training, the assessment community consists of other lecturers who supervise students in the same school, the teacher of the minor specialisation, head of committee, administrators, and other trainee teachers

in the same school. To facilitate the formation of lesson study community, approval to conduct lesson study approach in teaching training was discussed in the first session of the meeting.

## 6. CONCLUSIONS

Lesson Study approach provides ample space for teachers to collaborate and discuss the development of science in education. Through this approach, teachers will be more concerned with the process of teaching students to deepen student thinking rather than just thinking of the teacher's task to finish the syllabus alone. This atmosphere can create a culture of education and research, and friendly bilateral relations between the teachers and student, and also between students and other students. Therefore, this relationship can be established with more closely. This is because teachers not only need to know the development of the teaching process, but they need to learn about the outside of the school results in the classroom observations. Caring teachers of students assisted by community groups who are equally involved in the teaching process, although the implementation of Lesson Study is intermittent. In fact, the lesson study approach can contribute to the professional development of teachers in education, especially at the level of training. Through this approach, teachers will be more practical learning through collaboration pengalamanny of the various parties to improve pedagogy and education. Just as important is the willingness of teachers to embrace change and improve science to equally realize the changes in education.

## 7. ACKNOWLEDGEMENTS

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## Writing Mathematics Journal to Improve The Ability of Thinking Skill and to Communicate The Reasoning

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**Abstract:** Journal writing is an effective instrument to develop mathematical thinking and communication skills in mathematics. Journal writing in mathematics gives opportunities for students to assess and analyze what they have learned. It is a record of the experience received from particular math concept or problem solving activity. Students have to think about what they know in order to communicate it in writing. Therefore, students may obtain essential value about the mathematical problem solving process.

**Keywords:** Mathematics Journal, Thinking Skill, Reasoning Skill

### 1. BACKGROUND

I have been teaching Mathematics for over 10 years which I spend most in Primary level. The last 4 years I have been assigned to teach lower primary level. I really enjoy teaching lower primary level. As time goes on, I become more aware that this lower primary level is very important. This level is a phase when children start learning to organize and internalize information to construct and develop the understanding. In consequence, as teachers we are involved directly with the growth of children’s mind, we have to give them right concepts of knowledge.

Through the years of service as a Mathematics teacher, I always believe Mathematics is a subject that develops thinking skill. In lower level it is familiar for Mathematics teacher to apply the CPA (concrete→pictorial→abstract) approach that was introduced by Jerome Bruner. It is the connected steps from concrete objects to abstract symbols that is recommended for concept development. It is a very good approach to accustom young learners to work and think organically. Hence, it will help young learners later on when they start learning algebra in upper primary level.

For the nature character of mathematics as the area to develop thinking skill to solve problems in real life, therefore learning with understanding needs to take place. Learning based on understanding is more enduring, more psychologically satisfying and more useful in practice than learning based mainly on the rehearsal of recipes and routines low (Haylock and Cockburn, 2008). In mathematics, every concept needs to be understood properly. The beginning concept of arithmetics is about numbers. They have to be able to correlate an amount of objects with its

symbol (number) and compare which symbol is greater than the others. After they have understanding about numbers, they will learn the meaning of operation symbols and have to be able to operate them properly.

We use our thinking skill to solve problems in real life. The ability to solve problems requires some basic developed skills that work with synergy. These skills include knowledge, analysing, practising, observing, evaluating, reasoning, and communicating. Therefore, in mathematics learning process, applying the skills into learning activities is required.

It is important for us to encourage them to record important notes of some concepts as a journal. They may record an Idea of a concept, some examples or practices, unusual problem solving that they find difficult but interesting, conclusions etc. Realizing that the most important part in Mathematics is the process when young learners learn to understand an Idea by analysing, practicing, evaluating and concluding, Mathematics Journal plays a role as an effective instrument to accommodate the development of the skills. They may have more time to think of some notes that they do not really understand and highlight them. They record some ideas to solve higher order level of problems, analyse the different ways of solutions, and choose which one is suitable for them. They will learn to evaluate their work that will strengthen their understanding of the strategies which is good for the growth of their mind. This activity of writing Mathematics Journal is an effective instrument to develop reasoning skill that henceforward must be accommodated with the ability to communicate ideas with solid reason. Mathematics Journal can be also an instruments for teachers to know how well students understand the lesson that has been delivered.



## 2. HYPOTHESIS

To summarize the issues generally, there are some arguments to be proven further in a lesson study.

- a. Writing Maths Journal enables learners to develop their thinking skill and to communicate it with solid reasons.
- b. It requires an effective strategy of writing Mathematics Journal to give two-way advantages for both students and teachers. Therefore the journal can become an instruments for teachers to find out how well the students understand the delivered concepts, hence they can decide an action to follow up the problems in the next lesson and meet the objectives of the lessons.

## 3. REVIEW OF LITERATURE

Mathematics subject is recognized as the area of logic development involves planning, analysing, interpreting, predicting, reasoning, evaluating, and reflecting. Those components are the skills we use in real life either pertaining to solve easy matters of professional duties. Judy Anderson stated (NCB, 2009, p. 5) in her paper of ACSA (Association of California School Administrators) Conference 2009, a fundamental aim of mathematics curriculum is to educate students to be active, thinking citizens, interpreting the world mathematically, and using mathematics to help from their predictions and decisions about personal and financial priorities.

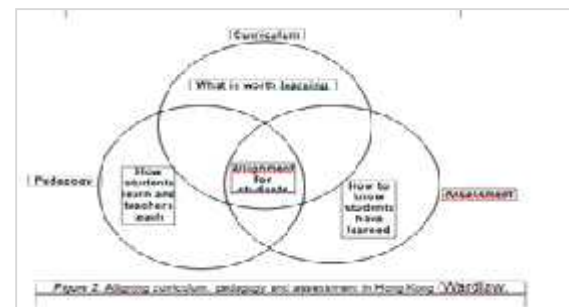
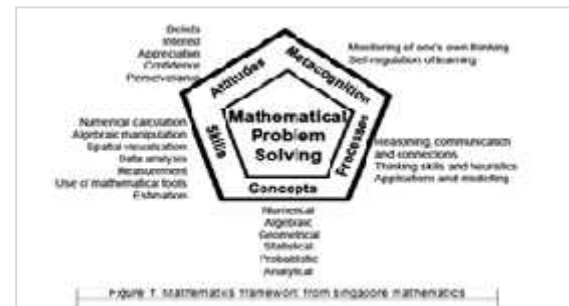
To solve mathematics problems, we are given some facts to help us plan certain strategy, make some predictions, analyse it, interpret the conclusions with solid reasons according to the related concepts in Mathematics. Sometimes we have to go through and evaluate the work to make sure all the process and the result meet the lessons' expectation. Same thing happen when we plan a family trip. After we decide the destination, then we identify all we need for the trip; transportation, accommodation, refreshment etc, we calculate the estimate cost together with unexpected sudden cost. Afterwards we break up the cost into how many months or how many days we can collect the budget. If we want to have some more places to visit, it means more budget to spend and we have to recalculate all the cost to find out how much money we may collect per time. Thus in real life we often handle things that require an ability to arrage a strategy with thinking skill.

It is also stated in Judy Anderson's paper of ACSA Conferense 2009, “ However developing successful problem solver is a complex task requiring a range of skills and dispositions”

(Stacey, 2005). Emphasize on understanding applies not only to children learning but also to teachers teaching (Haylock and Cockburn, 2008). In mathematics education, students need to have thorough knowledge and reasoning ability to produce valid work and mathematically acceptable. They certainly require good communication skill and the ability to work in a group. Therefore an effective teaching method with compatible instruments support will empower the students to equip themselves with the required skills.

Below is Judy Anderson's summary of the approach of problem solving in mathematics curriculums and the support provided for teachers in Singapore, Hongkong, England and The Netherland. She emphasized that the selected countries had been chosen to exemplify some of the approaches taken to highlight issues involved in implementation (ACSA 2009). The latest brief description of the problem solving approach of Indonesia mathematics curriculum is also included.

In Singapore, teachers are given challenges to design and use similar task in their lesson. Two initiatives *Thinking School Learning Nation* (TSLN) and *Teach Less Learn More* (TLLM) have aimed to reduce the curriculum content and engage the students in more thinking and problem-solving tasks (Kaur & Yeap, 2009).



The Hongkong Curriculum Framework has three interconnected components: Key Learning Areas, Generic Skills and Values and Attitude. Mathematics is one of the Key Learning Areas and the Generic Skills include: collaboration,

communication, creativity, critical thinking, information technology, numeracy, problem solving, self-management and study skills.

Mathematics curriculum in England contains a framework of personal learning and thinking skill and have a focus on assessment for learning. Problems solving is described as “lying at the heart of mathematics” and is represented as a cycle of a process including representing, analysing, interpreting, evaluation, communicating and reflecting.



Figure 3.4 Representation of process involved in problem solving (OCDF, 2008a) (p.11)

Pedagogical approach known as Realistic Mathematics Education (RME) is a framework applied in the Netherland. The framework is based on the notion that mathematics is a human activity and that students need to experience ‘re-inventing’ the mathematics for themselves or ‘mathemizing’ the problems during lessons.

Mathematics curriculum development in Indonesia has been aligned with the global development of mathematics education. The curriculum combines the RME (Realistic Mathematics Education), contextual learning and open-ended approaches. RME approach emphasize on equipping the learners with mathematics skills to solve problems in daily life. According to Freudenthal, the inventor of RME approach, mathematics is rich with human values that the realistic learning is applied along the process. It is more than a transferred applicable subject in certain amount of periods of lesson in class, the process applies human activities in life. Active learning takes place that learners are given realistic designed problems that stimulate thinking skill to develop mathematical tools thoroughly and solve the problems effectively.

Open-Ended approach first developed in Japan in 1970s as a research to evaluate and measure the ability to solve higher-order thinking Mathematics problems. The results of certain series of experiment shows that this approach is potential to improve the quality of Mathematics learning. The approach allows the learners to explore their methods to generate more than one applicable solutions to the problems. Therefore the problems are formulated in such ways that lead to

different valid answers both the processes and the results.

Contextual Learning is an approach of learning that allows learners to apply their academic ability in different conditions or subjects, as a group or individual. The strategy helps learners to correlate their role and responsibility as family member, citizen, worker, and student. The characteristic of the approach are problem-based, self-regulated, applicable in different context of situations that involve community or group of people, and responsive to the different needs of learners. It requires an ability of provable reasoning and communication to explain the proof hence it the community will recognize its validity.

Considering the mathematics curriculums and problem solving approaches initiatives of Singapore, Hongkong, England, The Netherland and Indonesia reveals some differences and similarities. In spite of the differences of technical procedures required in each approach, all acknowledge their curriculum to include more problem solving opportunities in mathematics lessons, examples in text books and also to include a method as an opportunity to sharpen the ability to communicate the reasoning of their thinking.

### 3.1 Writing

Mathematics and language are essentially related. Language place a substantial part in developing students fundamental concepts of mathematics. It is to reflect and record their understanding in writing, therefore we may get the clearest idea of how well the students have learnt in certain part of mathematics concepts. According to Mayer (in Mangisila and Wisniowska, 1996, p. 96), writing is a meaningful process in which students may actively develop connections between concepts that they have understood with concepts they are learning. Edel Reilly clarify in his mixed method study of writing in mathematics, that to gain clearer understanding of what actually students understand about mathematics they are studying, one needs to assess students’ thinking within mathematics classroom. Writing is a tool through which teachers can examine what students comprehend of the mathematical concepts they are taught (Kennedy, 1999; Robinson, 1998 in Reilly, Writing to Learn Mathematics, 2007, p.16).

### 3.2 Mathematics Journal

Journal writing in Mathematics is an effective instrument to develop mathematical thinking and communication skills in mathematics. Journal writing in mathematics gives opportunities for students to assess and analyze what they have

learned. It is a record of the experience received from the certain math concept or problem solving activity. Student have to think about what they did in order to communicate it in writing. By this means, students may obtain essential value about the mathematical problem solving process. Therefore doing math is not a task to follow the steps or rules without understanding. When a math journal entry is required as to follow up the specific learning goal, one actually has to think about what was done and what was required to solve the specific math activity or problem. Teachers may find that math journal can is effective to gain clearer picture of the students understanding and reflect themselves of how effective the activities and explanation impact the students' understanding of particular concept. Then they may be able to make a decision what action to follow up for further required review. Further reflection, this means can be also an effective way for teachers to reflect themselves to save more time by figuring out how they will bring mathematics problems to the class at the beginning of a topic. They will think of a good mathematics problem solving that covers several learning objectives. This can be a good strategy to gives opportunity to the students to correlate their knowledge of previous topics to be applied in the solution. This such activity covers many skills such as the strong understanding of fundamental concepts required, thinking skill, reasoning skill, communication skill, and reflection skill.

#### 4. METHODS

This proposal focus on 4 main areas to be developed in a lesson study in primary levels.

- Applying journal writing in mathematics in different grades of primary, especially lower primary.
- Proving that the journal writing in mathematics strengthen knowledge as well as the ability of reasoning and communication skill.
- Proving that the journal writing in Mathematics is helpful for teachers to reflect how successful the lesson understood by the students (informal assessment).
- How it help teachers to save more time to cover several learning objectives at a time.

To process the 4 areas, several observation in grade 1-3 had been conducted in a month. However, further well-prepared program of lesson study with some experts to guide the activity and evaluation is highly required to produce a fixed method that can be applied in all levels of mathematics education.

#### 5. FINDINGS, LESSON STUDY IMPLICATIONS, CONCLUSION

Here are some samples of Mathematics Journal

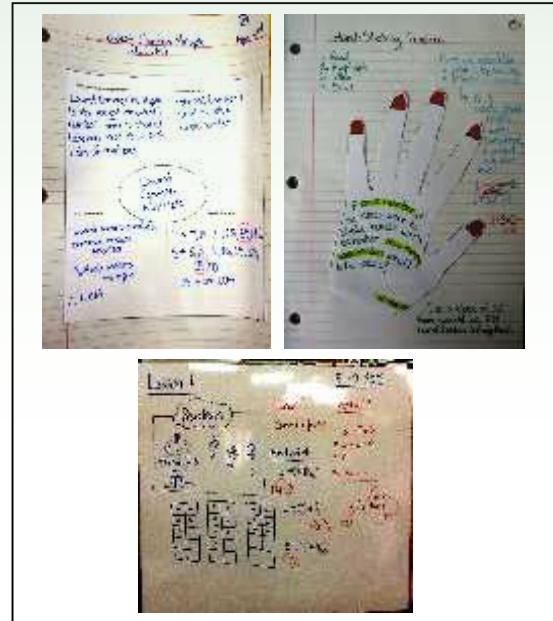


Figure 4. Samples of Mathematics

This is the summary of the usefulness of Mathematics Journal:

- For teachers to open a topic by giving them a problem to solve.
- For children to write their ideas to solve the problems.
- For children to refresh their prior knowledge and make connection to certain problems.
- As an instrument for children to produce a systematic work with reasoning in particular steps.
- For children to conclude a concept in the end of a topic.
- For children to review their understanding.
- For teachers as an informal assessment.
- For teachers to cover several learning objectives.

As to prove the effectiveness of Mathematics Journal to meet its goals, we made a lesson study group that consist of teachers from grade 1-3. We arranged a few classess to be observed within a month. Thus this was an extra program apart from the fixed anual program in our department and school. With this condition, we find a few difficulties especially to find fixed time to evaluate and discuss our finding of some observation we have done in certain classes.

We successfully conduct lesson study 4 times in different lower primary classes. Once in primary 3

and primary 1, and twice in primary 2. Here are the result we find in our observation:

- a. Only a few children find it useful. Those are the higher achiever children.
- b. It is not effective for middle and low achiever children. The problem for middle achiever children is the inability to show an organized work. Whereas the problem for lower achiever is the inability to understand the concept.

The two condition above are inferred after getting feedback from questionnaire that is given in the end of academic year (35 children of grade 2) and evaluating the condition of some samples of Mathematics Journal.

After we compare the sample Mathematics Journal (expected outcomes) and the one that had been applied at school. We conclude some mistakes in applying Mathematics Journal are:

- a. Lack of variety of Journal's activity.
- b. The designed activity is not encouraging students to share their ideas.
- c. Too much writing.



Figure 5. Samples of Children's

After conducting some discussion, we agree that the some causes of the mistakes are:

- a. There is a tendency to follow the book flow, therefore children write notes in their

Mathematics Journal quite often and it makes them feel too many learning objectives to gain. Before delivering a topic, it is better for teachers to design an activity for the Mathematics Journal that covers the main learning objective and connects the new concepts with their prior knowledge, therefore once a class discussion is implemented then at the same time the thinking skill and the communication development process take place.

- b. There is no activity that is able to measure their ability to communicate their ideas during the lesson.

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## Teachers’ Reflection in Lesson Study Process: A Preliminary Analysis

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**Abstract:** This study aims to explore the Malaysian teachers’ reflection as they engage in lesson study. Two lesson study groups of mathematics teachers in two primary schools involved in this study. However, in this paper, we only discuss the reflection of a lesson study group. This lesson study group comprised of six teachers and a headmaster. Three cycles of lesson study process were carried out and studied. Each lesson study process included four steps: (1) identify and formulate goals; (2) plan lesson plan collaboratively; (3) teach/ observe lesson; and (4) discuss/ refine lesson plan. Researchers participated in all the process of the lesson study processes to coach the participants as well as observe them. Qualitative data collected were videos of observed lessons, videos of reflection sessions, observation sheets and field notes. In order to explore the participants’ reflection in lesson study process, the videos of reflection sessions were imported into NVivo and transcribed. The participants’ utterances were coded according to categories. Preliminary analysis of data disclosed that teachers involved more actively in the reflection sessions when they reflected on their own research lesson. Their involvement in the reflection sessions increased from first reflection session to the third reflection session, on the other hand, the articulation of researchers decreased from first to the third reflection session. There were three major themes of reflection: (i) teacher and teaching; (ii) students and learning; and (iii) other. The number of subcategories under the theme of teacher and teaching was the highest if compared with that of students and learning, and other. As progress from first cycle to third cycle of LS, the content of reflection shifted from teacher and teaching to pupils and learning. The participants reflected more on pupils and learning. The preliminary result showed that LS process has slowly changed the teachers’ focus to more on pupils’ learning rather than teachers’ teaching.

**Keywords:** lesson study, reflection, in-service teacher

### 1 INTRODUCTION

Teaching is a complex activity. Everyday teachers are facing with various kinds of students and classroom situations. Thus, teachers need to equip themselves not only the subject content knowledge and teaching skill, but also flexibility and resilience in meeting up these changes and challenges. Reflection is one of the teachers’ professional developments (Calderhead & Gates, 1993; O’Sullivan, 2002; Suratno & Iskandar, 2010) which is gaining popularity. Through reflection, teachers recognize the complex nature of the classroom (Zeichner & Liston, 1996). Besides, reflection assists teachers to evaluate themselves and help them in realising their own weaknesses as well as strengths (Boon, 2002). Teacher will be able to see their needs and directions of searching for ideas from other sources after realising their strengths and weaknesses. As a result, reflective teacher will involve in professional development more actively (O’Sullivan, 2002). In sum, the process of reflection

improves the teachers in terms of their skills and knowledge (Boon, 2002). Hence, there is a need to promote reflective practice among the teachers.

Review of literature shows that not many studies were done on Malaysian teachers’ reflective practice. The studies done focused on both pre-service teachers (e.g. Nor Hasniza Ibrahim, 2006; Boon & Wee, 2005) as well as in-service teachers (e.g. Siti Mistima Maat & Effandi Zakaria, 2010; Suraya Sulyman, 2005; Tee, 2007). Although not many studies were done on teachers’ reflection, but the findings of all these studies revealed reported that reflection of pre-service teachers as well as in-service teachers were at low level. The scope of their reflection was narrow. This might revealed that majority of teachers in Malaysia do not reflect effectively and critically. Thus, there is a need to cultivate reflection practice and skills among the teachers.

Chiew (2009) reported that the process of lesson study promotes teachers’ reflective thinking and ultimately improve teachers’ teaching practice (Fernandez & Yoshida, 2004). Therefore, this study

was carried out to explore the teachers’ reflection when they engage in the lesson study process. And, in this paper, we report the content of teachers’ reflection in the lesson study.

### 1.1 Lesson Study

Lesson study, “*kenkyuujugyou*”, was originated from Japan. It is a conducted by teachers in Japan to improve their level of teaching competencies.

Lesson study drew the attention of the world and spread speedily to other countries after the publication of *The Teaching Gap: Best Ideas from the World’s Teachers for Improving Education in the Classroom* by Stigler and Hiebert in 1999. According to Stigler and Hiebert (1999) there are four main characteristics of lesson study: (i) lesson study is based on long-term continuous improvement model; (ii) lesson study maintains a constant focus on student learning; (iii) lesson study focuses on direct improvement of teaching in context; and (iv) lesson study is collaborative.

The process of lesson study, as shown in Figure 1, is comprised of four main components: (1) study, (2) plan, (3) do research lesson, and (4) reflect. At the beginning, group of teachers study the students’ current performance or achievement, and compare that with the ideal performance. Then, they formulate the goal for the lesson study group. Then, the plan a lesson plan based on the formulated goal. A teacher in the group teaches the research lesson to a class. During the research lesson, other teachers in the group and knowledgeable others observe the students’ learning in the lesson. They record the students’ learning. Then, teachers in the lesson study group and knowledgeable others gather to reflect together. They share data they have collected in the research lesson. Based on the reflection and discussion, the lesson study group revises the lesson plan. They can stop the lesson study cycle after they finish revising the lesson plan. Or, they can re-teach the revised lesson plan to another class of students.



(Source: Lewis, 2009)

Figure 1. The lesson study cycle.

### 1.2 Reflection

The theory of reflection was first advocated by John Dewey (1993). His definition of reflection was “active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusion to which it tends” (p. 9). The concept of Dewey was further added by Schön (1983) with the notion of reflection-in-action and reflection-on-action. Reflection-in-action occurs when the action is taken place, teacher interpret, analyze and provide solutions to the problem. Whereas reflection-on-action is carried out after the incident happens. Teacher finds meaning and make sense of what he/she has done. Killion and Todnem (1991) added reflection-for-action on top of the two reflections. According to them, this reflection revisits the past and the present experience, then think about the future action.

### 1.3 Theoretical Framework

The theory that underpins this study is Situated Learning theory. This theory was proposed by Lave and Wenger (1991). According to this theory, learning occurs through the learner’s legitimate peripheral participation in the community of practice. Learner is not acquiring a discrete body of abstract knowledge which they will imitate and apply in the next context. Instead, they are gaining the skill or understanding through engaging in the activity of the community of practice.

Community of practice is a “group of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis” (Wenger, McDermott, & Snyder, 2002, p. 4). Legitimate peripheral participation occurs when the newcomers or novices join a community of practice where their membership is recognized by the old-comers or experts in the community. They access to the resources and the network in the community as they engage the community of practice.

In this study, the community of practice is conceptualized as the lesson study group which consists of teachers and knowledgeable others. As they engage in the lesson study process, they interact and collaborate with experts (knowledgeable others or other teachers) and novices (other teachers) in the community of practice (lesson study group). After participating in three cycles of lesson study, teachers are expected to move in a centripetal direction, from novice to expert. They gradually develop their reflective thinking.

## 2 METHODOLOGY

### 2.1 Participants

The studies involved two lesson study groups. However, this paper only focuses on the data collected from one mathematics study group in a primary Chinese school. Table 1 shows the demographic data of the participating teachers and headmaster.

As shown in the Table 1, this lesson study group comprised of a headmaster (HM) and six teachers. Teacher TH only involved in the first cycle because he was a temporary teacher in the school, he has left the school to further study when the lesson study group carried out the second and third cycle of lesson study

Table 1. Demographic of the Participants.

Participants	Gender	Age	Year of teaching experience	Qualification
TH	Male	20	0	STPM
TE	Female	31	6	Bachelor Degree of Education
TI	Female	30	8	Diploma of Education
TN	Female	41	16	Teaching Certificate
TS	Female	28	6	Diploma of Education
TW	Female	30	6	Diploma of Education
HM	Male	54	33	Teaching Certificate

### 2.2 Procedure of Data Collection

At the outset of the study, the second author provided all the participants an introductory workshop. The workshop aimed to introduce the origin and process of lesson study to the participants. Besides, the participants also exposed to the process of reflection during the workshop. The second author played a video clip of a lesson taught by an Excellent Teacher. The lesson was a Grade 5 mathematics lesson with the topic of fraction. Immediately after watching the video clip, participants were required to write their reflection on a piece of paper. Then, the second author discussed their reflection together with them.

Then, teachers and headmaster set up lesson study group and started the lesson study process as displayed in Figure 1. Firstly, they identified and formulated goal of the lesson study. Secondly, they planned a lesson collaboratively. Third step, a teacher from the lesson study group taught the research lesson based on the planned lesson plan to a class of pupils. During the research lesson, other group

members and knowledgeable others (lecturers from university) observed the lesson. They were provided observation sheets. Fourth step, immediate after the research lesson, the second author interviewed six pupils who have following the research lesson. These pupils were selected by their teacher based on the academic performance, where two each from high, medium and low performing groups. This interview aimed to explore the pupils’ perceptions upon the research lesson. Their perceptions were brought into the teachers’ reflection session in order to enrich the teachers’ reflection. Lastly, fifth step, participating teachers, headmaster and knowledgeable others gathered and reflected on the research lesson. And, they refined the lesson plan.

This lesson study group carried out three cycles of lesson study. All observed research lessons and reflection sessions were video recorded with permission and transcribed for the purpose of analysis.

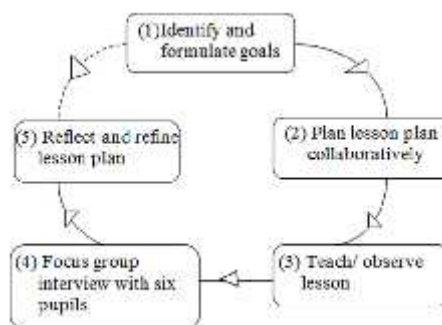


Figure 1. The lesson study cycle.

The data collected included the videos of research lessons, the videos of reflection sessions, observation sheets and field notes.

### 2.3 Data Analysis

In order to explore the participating teachers’ and headmaster’s reflection as they engaged in the lesson study process, the videos taken during the “reflect and refine lesson plan” sessions (Step 4) were imported into NVivo 10 and transcribed in verbatim.

Then, all the participants’ utterances were coded to their names. An utterance was defined as “a unit of analysis of speech that corresponds to any uninterrupted stretch of speaking by one or more people” (Rowe, 2004, p. 79). The frequency and percentage of coverage of utterance of each participant were computed using NVivo 10. The frequency and percentage of coverage of utterance were used to explore the participants’ involvement in the reflection sessions.

In addition, the reflection sessions were coded into the several main themes in order to explore the aspects of participants’ reflection.

### 3 RESULT

This section is divided into two parts. The first part reports the participating teachers', headmaster's and researchers' involvement in the three lesson study cycles. Meanwhile, the second part discusses the content of participating teachers' and headmaster's reflection.

#### 3.1 The Involvement of Participants in the Three Reflection Sessions

As shown in Table 2, teachers who were teaching the research lessons tended to involve more actively in the reflection session if compared with other teachers. This was shown by teacher TH and TE. Teacher TH taught the first research lesson and the frequency of his utterance was the highest (75 utterances) if compared with other teachers during the first reflection session. Likewise, teacher TE taught the third research lesson and the frequency of her utterance was the highest (43 utterances) if compared with other teachers in the third reflection session. Teacher TI taught the second research lesson, although the frequency of her utterance was not the highest, but it was the second highest (65 utterances) among other teachers.

Furthermore, teachers' elaboration and explanation was more when they reflected on the research lesson they taught if compared with when they reflected on research lesson taught by other teachers. As displayed in Table 3. the coverage of utterance of teacher TI was higher during the second reflection session (20.34%) compared with the third reflection sessions (3.17%). And, the coverage of teacher TE's utterance during the third reflection session was 21.08%, which was higher if compared with 0.28% and 1.22% during the first and second reflection sessions. This might be due to teachers have more feelings of ownership when they were reflecting on the lesson they taught.

Generally, the involvement of the participating teachers was not active during the first reflection session. For instance teacher TS, the frequency and coverage of her utterance were 5 utterances and 0.60% only. This incident might be caused by they were not used to reflect and discuss in group. But, when they continued to participate in the group, their involvement grew higher. For instance, the headmaster, his coverage of utterance rose to 25.10% during the third reflection session. The participating teachers and headmaster give more comments and suggestions on the research lesson during the second and third reflection sessions.

Table 2. The Frequency of Participants' Utterance in the Three Reflection Sessions.

Participants	Frequency of Utterance		
	LS 1	LS 2	LS 3
TH	*75		
TE	2	7	*43
TI		*65	4
TN	10	9	
TS	5	88	13
TW	3		5
HM	67		11
RO	91	32	14
RL	85	65	31
RT			5
RA		7	
RK		3	
Total	338	276	126

**Key:**

absence

\* Teacher who is teaching the lesson

In contrast, during the first reflection session, the frequency and coverage of researchers' utterances were high. For RO, the frequency and coverage of utterance were 91 utterances and 37.02%. Likewise, there were 85 utterances or 25.15% of the reflection came from RL. In other words, 62.17% or more than half of the reflection were contributed by the two researchers in the first reflection session. The researchers articulated a lot during the first reflection session because they asked questions to probe the teachers to reflect on the research lesson. In addition, they gave lots of comments and suggestions to refine the lesson plan. The frequency and coverage of researchers' utterance decreased in the second and third reflection sessions. For instance, the frequencies of RO's utterances reduced from 91, 32, until 14 utterances, as shown in Table 2. And the coverage of her utterances dropped from 37.02%, 12.00%, to 11.28%, as displayed in Table 3. The decrease of researchers' articulation from the first to the last lesson study cycles might implied that the researchers slowly withdrawn their scaffold as the teachers participate more actively in the reflection sessions.



Table 3. The Frequency of Participants’ Utterance in the Three Reflection Sessions.

Participants	Coverage of Utterance (%)		
	LS 1	LS 2	LS 3
TH	*15.22		
TE	0.28	1.22	*21.08
TI		*20.34	3.17
TN	1.33	2.89	
TS	0.60	45.97	13.88
TW	0.45		9.71
HM	19.95		25.10
RO	37.02	12.00	11.28
RL	25.15	15.29	13.73
RT			2.05
RA		1.54	
RK		0.75	
Total	100.00	100.00	100.00

**Key:**

absence

\* Teacher who is teaching the lesson

### 3.2 The Content of Participants’ Reflection

As shown in the Table 4, the content of teachers’ reflection was divided into three major themes: “teacher and teaching”, “students and learning”, and other. There were 11 subcategories under the major theme of “teacher and teaching”; five subcategories under the major theme of “students and learning”; and two subcategories under the theme of “other”.

Teachers and headmaster emphasized more on the “teacher and teaching” when they were reflecting on the research lessons. The number of subcategories under the major theme of “teacher and teaching” was higher than that of “students and learning” and “other”. Besides, the number of utterances categorized under the theme of “teacher and teaching” (63 utterances) was also greater than the number of utterance grouped under the themes of “students and learning” (29 utterances) and “other” (13 utterances).

The content of the participants’ reflection changed from cycle 1 to cycle 3. The scopes of teachers’ reflection became broader. During the first lesson study cycle, the participating teachers and headmaster discussed about seven issues only. Meanwhile, in the second lesson study cycles, the number of issues discussed by them dropped a bit to five issues. In the last lesson study cycle, the number of issues reflected by them increased to 11 issues. This might showed that the lesson study process made the teachers to reflect at the wider angle.

Table 4. The Content of Participants’ Reflection in the Three Reflection Sessions.

Content of Reflection	Lesson Study Cycles			Total
	LS1	LS2	LS3	
<b>teacher and teaching</b>				
(i) achievement of learning objectives	5	-	1	6
(ii) content of lesson	-	-	10	10
(iii) provide more examples	-	-	1	1
(iv) instruction given	-	2	3	5
(v) language mistakes	2	-	-	2
(vi) lesson plan	-	2	-	2
(vii) questioning techniques	3	-	3	6
(viii) several approaches	5	-	-	5
(ix) talking styles	2	-	-	2
(x) teaching materials	3	1	3	7
(xi) time management	4	7	6	17
<b>students and learning</b>				
(i) students' personality	-	-	11	11
(ii) hands-on activity	-	-	3	3
(iii) involvement or engagement of students	-	-	4	4
(iv) moral values	-	-	3	3
(v) students' actions	-	-	8	8
<b>Other</b>				
(i) cooperation among the teachers	-	-	2	2
(ii) not related to lesson	-	11	-	11

In addition, the focus of teachers’ reflection also changed from the first cycle to the third cycle. In the first two cycles, the participants never reflected on the “students and learning”. But, in the third lesson study cycle, there were five issues related to students and learning appeared in the reflection session.

Overall, the aspects related to “content of lesson”, “time management” and “students’ personalities” were the most comments issues reflected by the teachers during the reflection sessions.

## 4 CONCLUSIONS

This paper discussed the reflection of a lesson study group when they engaged in the lesson study process. Preliminary analysis of data collected showed that teachers' involvement increased from first to the third reflection sessions. On the other hand, the articulation of researchers in the reflection sessions dropped from first to the last reflection sessions. Teachers tended to articulate more when they were reflecting on the research lesson they taught if compared with that of other teachers. Teacher and teaching was the popular theme in the reflection sessions. The participating teachers and headmaster did not talk about students and learning in the first two reflection sessions. They started to reflect on aspects related to students and learning only in the third reflection session. This might show that the reflection sessions in the lesson study process changed the teachers to focus on students and learning when they were reflecting.

## 5 ACKNOWLEDGEMENTS

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## The relationship between ‘Lesson Study’ and Novice Teachers Professionalism: A case study of a mentoring program in secondary education in Indonesia

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**Abstract:** In Indonesia, little attention has been paid to the benefits of mentoring for novice teachers’ professional development. Mentoring seems to be conceptualized and identified differently from western contexts. The Indonesian government has launched mentoring programs in the form of professional development programs, such as Lesson Study and Piloting Activity. The lesson study program has been identified as a part of clinical supervision models of mentoring. The studies on the ‘mentoring’ programs in Indonesia show that the programs provide positive impacts on teachers’ instruction, but are perceived by in-service teachers as time-consuming program. Other studies provide evidence that the lesson study programs have provided valuable effects on the teachers’ professionalism and has many benefits for better teaching refection with some shortcomings, such as: cultural barriers and teachers’ low awareness of the schemes. Nevertheless, such programs are likely to provide the same types of support for both in-service teachers and novice teachers as they participate in the same mentoring programs. Consequently, novice teachers may struggle in their first teaching phase. Mentoring programs for novice teachers in Indonesia are not sufficiently empirically studied. The aim of this study is to explore specific aspects that are effective when using ‘Lesson Study’ in the mentoring program to develop novice teachers’ professional development in “Sekolah Permata Hati” (a secondary school) in Indonesia. This is necessary since a mentoring program can be proposed to enhance the existing training programs offered in the novice teachers’ professional development programs. The preliminary report finding shows that a ‘lesson study’ program that has been embedded within a mentoring program seems to have positive impacts on novice teachers’ professionalism with some limitations. Most teachers stated that a successful ‘lesson study’ will be difficult to be achieved without mentoring support due to the problems of preparation and planning, reflective practices and program sustainability. Therefore, it is necessary to strengthen new teachers’ professionalism using mentoring strategies in their early phase of teaching.

**Keywords:** lesson study, mentoring program, mentor, and mentee.

## 1 INTRODUCTION

### 1.1 Background of the study

Studies launched in many countries on the issue of impact of teacher training and that of teacher knowledge and preparation indicated that mentoring creates a distinction in teaching effectiveness (Wong and Wong, 2008; Koballa, et al., 2008; Kutcy and Schulz, 2006). A well-organized mentoring program may stimulate beginning teachers’ enthusiasm to develop their teaching competences. This program seems to be more than senior-junior teachers’ affiliation; it is a sharing knowledge in a collaborative teamwork. Both parties attain improved teaching skills and expertise in a dynamic mentoring process. As argued by Wang, et al. (2008), teacher learning and the on-going development is regarded as a life-long enterprise. The mentors can exchange and refresh their knowledge by working together with their junior colleagues; while new teachers will be

more prepared to face the real teaching situation that may make them frustrated and feel isolated in new environment. To prepare new teachers’ readiness in teaching, it is suggested that teacher education must be designed to support the development of teachers’ adaptive expertise in efficiency and innovation (Johnson, 2009; Jonson, 2008; Wang, et al., 2008).

Many researches have interrelated quality education with quality teachers and teaching (Dinham, 2008; Koballa, et al, 2008; Achinstein, et al, 2004). For teachers to take a part of advancing student improvement and outcomes, it is critical for them to increase themselves pedagogically through proper training and continuing professional development. An untrained teacher is likely to teach in the way he or she was taught at the training college when a powerful teacher education process such as mentoring was not available or recognized as important opportunity to transform teaching across generations (Darling-Hammond, 2003). It is obvious that under-qualified teachers could damage or limit quality teaching and learning.

Typical teacher education programs tend to spend too much time on acquainting trainee teachers with strategies for teaching basics (Strain, 2003) that are often out of touch with the ‘real’ teaching in the schools (Kutcy and Schulz, 2006) and sometimes conflict with the local culture of learning (Peacock, 2009; Hu, 2002 cited in Dogoncay-Aktuna, 2005). Teacher education has a tendency to present more teaching and learning theories and ignores the practical experience on dealing to actual teaching atmosphere, such as how to overcome students’ misbehavior in the classroom, to adapt teaching syllabus to local cultural context and to work with other teachers collaboratively to improve students’ achievement. This situation may cause new teachers to work in isolation (Wang, 2008) and feel frustration (Hobbs and Kubanyiova, 2008). Such frustrations could lead to teachers’ attrition (Wang, et al., 2008). Therefore, it is argued that mentoring could play a big role in decreasing further damage to teaching.

The Indonesian government has been focused on the upgrading of teachers’ quality and abilities through mentoring. The prominence of mentoring has been accepted in Indonesian laws: The law mandate No. 14/ 2009 about *widyaswara* refers to senior teachers’ responsibility to mentor their juniors; and Law No. 74 / 2008 refers to mentoring from senior to junior lecturers in universities (Departement Pendidikan Nasional Direktorat Jenderal Pendidikan Tinggi, 2010). Mentoring is an essential task for all qualified government teachers. However, these programs particularly provide support to particular government teachers, less concern on private teachers. At present, there has been little discussion about specific mentoring programs for novice teachers in Indonesia.

In Indonesia there are many different types of professional development programs in place for teachers. Based on Law No. 14/ 2005, the government provides a teacher certification program (MONE, 2008) as a strategy for teacher quality improvement (Jalal et al., 2009). Indonesian government promote this program to motivate the teachers improving their teaching qualities that may impact on greater students achievement. Nevertheless, this certification program has many issues including the widespread use of forged certificates in teachers’ portfolios (Sugiharto, 2009); poor validity and reliability of teachers’ competence assessment (Maulia, 2008); faulty certification processes due to bribery issues and a lack transparency of assessment (Sulistiyo, 2009, cited in Jakarta Post, 2009). In addition, studies indicate that although the certification program helps teachers to gain promotions, it does not improve student achievement (Fahmi et al., 2011). The teacher certification program that is aimed to develop teachers’ professionalism would appear to be a

failure. The program supports higher salaries, but with less impacts on teachers’ competencies. These teacher certification issues have thus turned into a significant problem in Indonesia.

For these reasons, novice teachers require opportunities to participate in professional communities, which can provide effective and meaningful mentoring and support, to assist their assimilation in their early career phase. Additionally, timely mentoring advice may lead to teacher qualification upgrading.

## 1.2 Research Problem

A number of studies in undertaken in western countries indicate that mentoring programs assist novice teachers to enhance their professional teaching growth (Peeler & Jane, 2005; Richardson et al., 2007; Youngs, 2007). However, in Indonesia, few studies illustrate the benefits of mentoring for novice teachers. In Indonesia, mentoring appears to be conceptualized and identified differently from western contexts. In the Indonesian context, mentoring programs are considered to be in-service training programs and professional development programs.

The Indonesian government has launched mentoring programs in the form of professional development programs, such as Lesson Study and Piloting Activity. These programs are generally undertaken through joint lesson planning, observation and reflection in university-schools partnership (Suratno, 2012; Suratno & Iskandar, 2010). The lesson study program has been identified as a part of clinical supervision models (Acheson & Gall 2011). Although the ‘mentoring’ programs are widely implemented in the schools, the programs appear to overlook the importance value of mentoring for novice teachers.

## 1.3 Purpose Statement

Mentoring programs for novice teachers in the schools in Indonesia are not sufficiently empirically studied. It is an important area since it impacts on novice teachers’ professional development. The present study will gather information regarding a specific case of a mentoring program in a secondary school in Indonesia. The aim of this study is to explore specific aspects that are effective when using ‘Lesson Study’ in the mentoring program to develop novice teachers’ professional development in “Sekolah Permata Hati” (a secondary school) in Indonesia. This is necessary since a mentoring program can be proposed to enhance the existing training programs offered in the novice teachers’ professional development programs.

Additionally, the study investigates this mentoring program to gather extensive data from the participants identifying the strengths and weaknesses of the model to develop novice teachers' professionalism. The findings of the study will be beneficial in providing recommendations in developing better school-based mentoring in Indonesia in the future.

## 1.4 Research Questions

Main Question:

What aspects are effective when using 'Lesson Study' in the mentoring program?

Sub Questions:

- What are the strengths and weaknesses of this model to develop novice teachers' professionalism?

## 1.5 Significance of Study

The findings of this school-based mentoring program will be used as a foundation to plan more effective mentoring programs in secondary education and other educational sectors. In the wider context, the results of the research will provide advice to relevant authorities, such as the Indonesian government, educational stakeholders, school leaders and teachers to design more effective policies and practices of mentoring that will improve teachers' professionalism. Also, successful mentoring activities may contribute to the development of novice teacher mentoring literature in Indonesia and other similar contexts.

## 2 LITERATURE REVIEW

As mentoring novice teachers is the main theme of the literature, the discussion will be presented in the following interconnecting sections: concept of mentoring for novice teachers and mentoring concept for novice teachers in Indonesia.

### 2.1 Concept of Mentoring for novice teachers

Mentoring is defined as “a process whereby someone with more experience and expertise provides support, counselling and advice to a less experienced colleague” (New South Wales Department of Education and Training (NSW DET, 2001, p. 2). Another perspective identifies mentoring as “a process whereby an experienced and knowledgeable colleague facilitates the socialization and

professional development of another” (Bhindi, 2003, p. 4). Mentoring offers support, counselling, advice and facilitation from senior colleague to their junior one in their early phase of teaching to develop their professionalism.

Traditional models of mentoring include the master-novice apprentice model where a master teacher is assigned to a novice for her or his initial year in the profession (Blair, 2008). Here, the master teacher functions as a mediator to mediate the teaching skill of his /her novice teacher. Vygotsky (1978) identified this as semiotic mediation. Following Vygotsky (1978, 1981), the process of mentoring can widen what he called the Zone of Proximate Development (ZPD). He believed that the development of higher mental function appears twice, or on two planes. First it appears on the social plane and then on the psychological plane. This means that “the interaction between the master and the student in the mentoring process will help the later in developing his/her skill as an individual” (Vygotsky, 1981 p. 161). The interaction between senior teachers and their new teachers in a dynamic mentoring conversation creates a productive mental set of learning that leads to enhanced teaching aptitudes.

Cohen argued that mentoring is “a behavioural activity which refers to a one-to-one relationship that evolves through reasonably distinct phases between the mentor and the adult learners” (1995, p.61). The relationship between mentor teachers and their mentees is more personal as they work as a close partner. Citing from ANTA, Bond (1999, p.6) argued that mentoring is “a deliberate pairing of a more skilled or experienced person with a lesser skilled or experience one, with the agreed upon goal of having the lesser skilled persons grow and develop specific competencies”. This definition is not restricted because words such as “teaching”, “coaching”, “advising”, “training,” “directing” and “protecting” are substitutes for the word “mentoring”. Furthermore, Bond (1999) claimed that in a mentoring process, mentors engage in productive activities with the mentees in equal amount of interest. On the basis of these definitions, it can be concluded that mentoring is a process of knowledge and skills transference from the experienced to less experienced one to their professionalism.

### 2.2 Mentoring for Novice Teachers: Indonesian Experience

In Indonesia, little attention has been paid to the benefits of mentoring for novice teachers. Research databases do not yield many scholarly studies on the topic of mentoring in Indonesia. Mentoring seems to be conceptualized and identified differently in

Indonesia. In the following section, it will discuss some forms of mentoring that has been applied in the school setting in Indonesia.

### 2.2.1 In-service Training and Teacher Education Framework

Some scholars have found certain impact of mentoring for teachers in Indonesia. To start with, a study of the *Permantapan Kerja Guru* (PKG) -a Teacher Training Program (TTP)-approach to in-service teacher development in Indonesia for science teachers showed that the project was a motivated undertaking (Treagust, 2003). This program established a widespread network of teacher-trainers in Indonesia to strengthen teachers' professionalism. As the first national teacher training, this program can be categorized as a leading professional development program in Indonesia.

In addition, there was a relevant study of teacher training in Indonesian secondary schools by Thair and Treagust (1999). They claimed that in upgrading teacher qualification across the Indonesian archipelago, the result of PKG was impressive. They asserted that the implementation and practice of PKG in Indonesia reflected similar practices in industrialised countries, but with some contextual barriers, such as: less support from government to adapt the curriculum, time constraints for teachers and less availability and maintenance of laboratory equipment in schools (ibid, 1999). However, this pioneer program has provided a significant contribution to encourage other growing teacher professional development programs now.

This program was later developed as *Musyawah Guru Mata Pelajaran* (MGMP) (defined as Subject Teachers' Self-learning Association/teachers forum) (Saito, et al., 2007). MGMP activities tend to be conducted in the central cities of districts and are attended by representative members from various schools and regions as clinical, school-based activities. These activities are necessary to focus on a solid grounding in subject contents and to improve teachers' confidence, supported by shorter programs in classroom methodology and ongoing support through strengthened subject matter teacher forums (TACR, 2006). Nonetheless, although all studies above could be categorized as a good model of the mentoring practice in Indonesia, there were less empirical data on the effectiveness of these practices for teachers' quality and students' outcome improvement. Moreover, the program seems to ignore the potency of new teachers to advance their teaching competences.

There are studies on in-service training that resembled 'mentoring' practices. For instance, the in-

service training where the partnership between schools and universities in in-service training was aimed to improve science and mathematics education for both targeted secondary schools in Indonesia (Saito, et al., 2007). They suggested that teachers collaborate to improve teaching curriculum through joint lesson planning, observation, and reflection, called *Piloting Activities* (PA). The findings of the study showed that faculty members and teachers were generally more participative and the program has developed the collegiality within schools and between faculty members and teachers. This situation seems to be a collaborative teamwork as practised in mentoring. However, PA is perceived as time-consuming approach. Both teachers and faculty members complained about the tension of covering the entire curriculum while also pursuing the targeted experimental activities.

### 2.2.2 'Lesson Study' Mentoring Framework

The resembled 'mentoring' practice appears on a study of 'Lesson Study'. The program is generally undertaken through teachers' collaborative lesson planning, observation and reflection in university-schools partnership (Suratno, 2012; Suratno & Iskandar, 2010), has been categorized as a part of clinical supervision models (Acheson & Gall 2011). The clinical supervision model reinforces systemic observation of the mentees' behaviour and teaching methodology as the most important data collection approach to improve instructional strategies.

Despite its positive impacts on teachers' professionalism, the programs have a number of problems in practice. Marsigit (2007) argues that the programs provide positive impacts on teachers' instruction, but unfortunately they are perceived as time-consuming. Another study states the programs improve teachers' professionalism (Anggara & Chotimah, 2012) and encourage teacher reflection on their classroom practice (Suratno & Iskandar, 2010). However, problems in the program implementation, such as cultural barriers and teachers' low awareness of the schemes (Suratno & Iskandar, 2010) are identified. Overall, although 'similar' mentoring programs are considered to be very important, such programs are likely to provide the same types of support for both in-service teachers and novice teachers as they participate in the same mentoring programs. Since novice teachers need different teaching support from in-service teachers, they may struggle in their first teaching phase.

### 3 RESEARCH METHODOLOGY

#### 3.1 Research Approach

This study employs a qualitative, case study approach. The study focuses on a single mentoring case in a secondary school in Indonesia. The case study is an appropriate approach to adopt in order to address a case in a “bounded system” (Hesse-Biber & Leavy, 2011) restricted by time and place (Creswell, 2013). The focus of the study is bounded by one mentoring case in an Indonesian cultural context. Furthermore, the case study is the most flexible method to adapt and to probe mentoring programs as an emergent theory (Hartley, 2004). Using the design, the researcher will be able to provide in-depth understanding of a school-based mentoring program in the participants’ events in their real life.

#### 3.2 Research Site

In this study, the research site is “Permata Hati” secondary school, which has adopted a school-based mentoring for novice teachers. This site is located in East Java. The school is managed by one of the Islamic boarding schools in Indonesia and has 166 teachers and 1440 students. The selection of the school is justified for the following reasons. Firstly, the school has regular school-based ‘mentoring’ activities and the school has implemented ‘lesson study’ programs, which have been categorized as a ‘clinical supervision-mentoring model’ (Acheson & Gall, 2011) as part of the regular professional development programs. Secondly, the school has a clear agenda and policy of ‘mentoring’ and the program is mandatory for all teachers in the school.

#### 3.3 Research Participants

The research involved in total seven mentors and seven mentees in a ‘Permata Hati’ secondary school in Indonesia. In this study, all data collected are treated in a highly confidential manner and the participants and sites’ anonymity will be protected by using pseudonyms.

#### 3.4 Data Collection Procedure

As stated by Yin (2003), the strength of case study data collection is the opportunity to use many different sources of evidence to address problems of establishing construct validity and reliability of the case study evidence. The aim is to compare the perspectives of participants using multiple sources. These different sources are necessary to corroborate the same facts or phenomenon as a process of

triangulation (Yin, 2003). In this study, data collection procedures include individual interviews, focus group interviews, and document reviews. Conversely, this work-in-progress paper will only discuss the analysis from a single interview data.

### 4 TENTATIVE FINDINGS

In this work-in-progress report, a small component of the study will be outlined. The tentative findings of ‘Lesson Study’ framework from single interview are the main focus of the discussion.

#### 4.1 ‘Lesson Study’ (LS) Framework

In the research site, it seems the lesson study pattern develops from classroom observation model, which is called as ‘open class/ open lesson’ model, into a form of more structured teachers professional development, ‘lesson study’ with mentoring support.

From the data analysis of a single interview, the participants tend to compare the pattern of two LSs they had practiced in their school. To differentiate both framework, two different terms are used in this study. The overview of both school-based LS framework is shown in the following diagram.

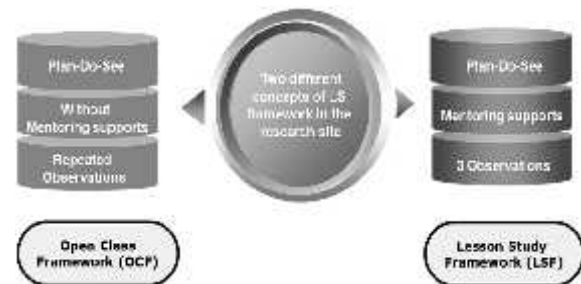


Diagram 1. Two concepts of LS in the research site.

The first LS is called Open Class Framework (OCF). In this program, the teachers practiced LS framework using format Plan-Do-See cycle without mentoring supports. In ‘Plan’ phase, the senior teachers, new teachers and LS team (a moderator and a coordinator) gathered in a classroom to discuss a specific lesson plan and design the teaching plans for the classroom observation. They appointed a model teacher to practice the teaching.

The teaching observation was in the ‘Do’ session. All teachers observed and noted the model teacher’s teaching practices from perspective of his/her students’ reaction and behaviour in the classroom. It was not allowed to comment on the teacher’s teaching behaviour in the practices.

After finishing the observation, the ‘See’ session was a significant part to reflect upon the teaching observation practice. In this phase, all teachers

discussed the practices, provided the comment and solutions for the teaching improvement. Then, the cycle started again until they can meet the best practices for the students' learning achievement.

The second framework is LS with mentoring support, which is called as 'Lesson Study Framework'. In the cycle of 'Plan-Do-See', some essential different concepts are shown in the diagram below.

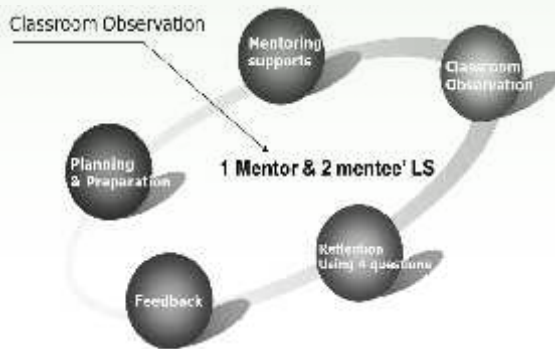


Diagram 2. LS with mentoring support cycle.

In the phase of 'Plan' of LSF, all teachers had longer preparation than OCF. They met every week within ten weeks to discuss wide-ranged teaching topics, such as: preparation and plan of teaching, classroom management, professional development, teaching media and sources, collegial relationship and other teaching aspects. In the 'Do' phase, the teachers practiced three teaching observations, they are one mentor's teaching observation as a role model of teaching for the mentees and two mentee's teaching observation for the actual practices. Furthermore, in the 'See' phase, all teachers participated in reflection session where the mentees analysed their own observation using four reflective questions: What is the most satisfying aspects in your teaching practice; what aspects should be retained in your teaching practice; what aspects needs improving in your teaching practice; what aspects should be eliminated in your teaching practice. The mentees had more freedom to share their feelings about their teaching experience. In this case, their mentors only provided comments on their mentees' self-reflection and gave solutions for better teaching practices. The reflective session offers more dynamic conversation and more active experience sharing between mentors and mentees. In all sections, the novice teachers obtained a personal and professional support from their mentors to develop their professionalism.

## 4.2 LSF is more effective than OCF to enhance novice teachers' confidence in their teaching observation.

Teaching observation is an integral part of successful professional development programs of any newly qualified teachers (Luft and Cox, 2001). Observation of teacher behaviour and methodology is the most important data collection approach to improve teaching and learning strategies.

In this study, a small component of the study findings will be drawn. The first finding is about the effectiveness of LSF in preparing novice teachers' teaching observation practices. LSF seems to be better than OCF from three diverse factors:

### 4.2.1 Greater organisation in preparing and planning the LS observation.

LSF has greater organization in preparing and planning teaching observation using mentoring supports, collaborative learning and reflective discussion. For mentees, the preparation in the mentoring program helps them to be more ready facing the LS observation. As stated by Bu Risa:

"In my opinion, LSF was really effective. Getting supports from our mentor, I could prepare the observation better, I was more excited and more motivated to make observation preparations. Consequently, I was ready to show my best teaching performance in the observation".

Similarly, the mentor feels that the support will be important part in their mentee's teaching phase. As a mentor, Pak Faiz pointed out:

"LSF was more effective because the model teacher (mentee) would feel confident that he/she would show better teaching performance after receiving mentoring support about how to make the lesson plans, the learning steps, and teaching strategies and so on. Accordingly, he/she would trust their self-competences and feel more confident to carry out their teaching observation".

The mentoring supports from the mentors improve mentees' confidence in performing their teaching in LS observation. Using LSF, mentor can observe novice teachers' behavior and methodology to improve their further teaching and learning strategies. Consistent with this finding, Gagen & Bowie (2005) stated that in a mentoring program, mentees are provided with professional and personal aid to enhance their teaching capacity and developing their confidence in their first teaching phase.

### 4.2.2 Manageable Observation Process

In practicing teaching observation, LSF tends to have more manageable observation process. The



observation practices seem to be easier to manage and the timetable does not disturb other teaching activities. As a senior teacher and mentor, Pak Faiz pointed out:

“The advantages of LSF, the timetable was organized well, not much interfering the teachers’ teaching activities. It was different with OCF. It was problematic as almost all teachers were getting involved in the teaching observation, then they should leave their teaching activities. The learning activities stopped and the students did not get any benefits from the teaching activities”.

In another affirmative point, by using LSF, there will be more sustainable program for the teachers’ professional development. Pak Irsyad affirmed:

“I think LSF was more effective than OCF as in OCF, the teachers practiced teaching observation, got reflection and there was no further activities due to difficult time management. Conversely, the LSF had more structured schedule and the mentoring support in LSF had the nature of guiding, it was like the older people guided a child and then released him when he was independent”.

Time management is one of the biggest issues to improve novice teachers’ professionalism (Kirkby, 2009). However, the findings of the study show that in LSF seems to have a more structured timetable for practicing classroom observation. Moreover, allocating time within the teachers’ teaching workload, mentors still can guide their mentees and discuss the deeper mentoring issues through formal and informal meetings in supportive relationship. Consequently, the manageable schedule can provide more opportunities to new teachers to prepare and strengthen their teaching skills and knowledge through many teaching practices.

### 4.2.3 Productive Reflective Practices

After practicing teaching observation, the teachers participate in a reflection session. This session aims to support observation practices, give analysis and obtain feedbacks on the mentors-mentees’ previous teaching performance. This activity is not only beneficial for refreshing and reinforcing the mentors’ teaching qualities, but also helpful for developing mentees’ teaching abilities. In the findings of the study, LSF shows more contented reflective practices for both mentors and mentees.

In LSF, mentors do not assess their mentees’ performance as the mentees should analyse their own teaching performance by answering four reflective questions. As a mentor who had participated in OCF before joining LSF, Pak Hafid compared two teaching observation models:

“Using the LSF model, the teachers being observed would feel less fear than using the OCF in the reflection session. In OCF, many observers often

gave negative assessments and commented on many students’ negative behaviour from the observation practice. On the contrary, the reflection phase in LSF, the mentor and mentee gathered, the mentees answered the four reflective questions and analysed her/his own teaching practices, then I only gave her feedbacks for her teaching improvement”.

Additional affirmative experience felt by a mentee. By doing reflection in LSF, the mentee has better self-awareness. Bu Nisa shared her positive feelings:

“When I received feedbacks from my mentor, I felt happy because I was able to know my strengths and weaknesses in my teaching. I also did not feel hurt when knowing my shortcomings because I think that the feedbacks could enhance my understanding, knowledge and expertise in the field of teaching and learning”.

The productive reflective practices within LSF may enhance new teachers’ teaching expertise. The purpose of doing self-reflection is to learn from experiences and create solutions for difficulties faced by the mentor (Nevzat, et al., 2010). By getting feedbacks from their colleagues, novice teachers can identify their teaching strengths and weaknesses and find solutions for better teaching performance.

## 4.3 OCF practices have many limitations

Previously, the teachers have practiced OCF in their school. On the contrary of LSF, the format of the observation in OCF lacks of organized preparation and planning, manageable observation process and dynamic reflective practices. The findings about the OCF limitations will be drawn in the next section.

### 4.3.1 Less preparation and planning in OCF

Poor preparation and planning of observation can lessen teacher model’s confidence in the teaching observation practice. As a mentor who became a model teacher, Pak Faiz affirmed:

“In OCF, all teachers in open lesson team decided to the lesson plans design, but not entirely the teaching procedures and instructions were determined together. One year ago, I was becoming a model teacher, and my team just handed over responsibility completely to me. I was not sure whether my design of lesson plans was 100% true or false. And then, the observers revealed my mistakes within the reflection session, my design was still wrong”.

Handing over all responsibility of observation preparation and plans to the appointed model teacher creates more burden to the teacher and may lessen the teacher’s confidence in their teaching performance. Furthermore, an unstructured

preparation and less support from the mentor can hinder the mentee’s learning improvement. Bu Zakia, a mentee who had practiced both LSF and OCF said:

“When I practiced observation in OCF, I obtained many difficulties to prepare and plan the teaching observation, there was no clear overview of the observation, and the preparation was not structured well, not as good as in LSF. I was so confused and did not know what I should do and there was no further guidance. Besides, there was less positive feedback given in the reflection session”.

When the model teacher is not ready and feel heavy burden in their teaching observation preparation, their observation practices will not be success. Moreover if the observers do not provide positive feedbacks, the teacher may feel isolated and less valued. Consequently, this condition can impede his/her teaching professionalism. Additionally, in many observation cycles involving novice teacher, the mentor (team)’s mind thinking, behaviours, and beliefs are often not shared or understood by the mentee. So, the mentee (model teacher) may not feel comfortable or feel that they are being spied (Lerch, 1980). When a negative perception develops, the model teacher may not perform their natural teaching practices. They would not act in a natural way. So that the observation data gathered may not reflect the authentic teaching practices. Therefore, there will be less opportunities to find appropriate solution for the model teacher’s enhanced teaching performance.

### 4.3.2 The reflective practices lead to many negative feelings

It is indicated that reflective practices in OCF create many negative feelings for the teachers. For the mentee, reflection model in OCF indirectly forms apprehension feelings. As a novice teacher, Pak Irsyad pointed out his feelings:

“For new teacher as like me, when my teaching performance was observed by many colleagues, I think I would feel very uncomfortable due to many painful comments”.

Therefore, these negative feelings can inhibit novice teachers’ professional growth, as affirmed by Bu Ratri:

“Based on my own experience as a model teacher in OCF, I felt scared and anxious being observed or judged by my colleagues. Actually, the rules of OCF emphasized that the observers would not observe the teacher model’s teaching behaviour, they could only observe the behaviour of students in teaching practices. However, such statements were actually just to increase teacher model’s confidence in OCF practices. In fact, although the teacher models could not be blamed, but it would be turned

against the model teacher. This happened because the ‘open’ discussion culture was still lacking here, the observers were not polite to criticize directly to the model teacher, so his/her students were criticized.”

In the problem solving and feedback phase, there are possibilities for personality conflicts (Lerch, 1980) due to misunderstanding of reflective analysis (Acheson and Gall, 2011) and negative evaluation or criticism (Reilkoff, 1981). Moreover, cultural barriers can obstruct a collaborative teamwork and communicative conversation. In Indonesia, open dialogue may not be truthfully achieved. As a recognized shared culture, Javanese influences many educational practices in Indonesia. In Javanese culture, “the open expression of feelings is considered of extremely bad taste” (Magnis-Suseno, 1997, p. 45). There has not been a willingness to share ideas honestly and openly. This is caused by a strong embedded Javanese principles: principle of conflict avoidance, the principle of respect and the ethics of social harmony (Magnis-Suseno, 1997). As a result, these cultural problems may inhibit the teachers’ reflective thinking improvement that influence to inadequate teaching practices.

### 4.3.3 Unsustainable program of OCF.

OCF also has time management problems due to many teachers’ involvement in the observation, as stated by Bu Ratri:

“The weakness of observation session in OCF was difficult time management. When doing observation, many teachers, might be more than 10 people, got involved in the teaching observation and they should leave their teaching jobs in the classroom. So, it meant that the teachers had to overlook their main job to educate the children in the classroom”.

In the same situation, Bu Sita pointed out the same opinion about time management problems:

“Just by doing a one-time practice of teaching observation in OCF for a group of science teacher, totalling eleven people left their teaching duties, the teachers should ignore their students’ learning needs. Moreover, there was no sustainable program of OCF due to difficult time management. I think LSF was more effective because I only engaged with one teacher in the practices and I could make an appointment with my mentee in my free teaching timetable without leaving teaching jobs. The timetable was also flexible and personally much easier to set up the preparation and so on”.

OCF as a part of clinical supervision model is considered as a time-consuming model (Acheson and Gall, 2011). In OCF, the observation phase should be repeated frequently to achieve the best practices. In this case, gathering many teachers and repeating many observations within heavy teaching workload

seem to be a demanding task. In summary, OCF cycles is considered as an inefficient process to change the teachers' behaviour and methodology.

## 5 INITIAL CONCLUSIONS

From the tentative findings of the research, it is identified three top initial conclusions. Firstly, LSF may be a more efficient way of improving new teacher professionalism in the beginning phase of teaching life. Secondly, factors that enhance novice teachers' professionalism using LSF are greater organisation in preparing and planning the LSF, manageable observation processes, and productive reflective practices that lead to mentees' confidence and self-awareness in their teaching performance. Finally, a successful OCF will be difficult to achieve due to the problems of teaching observation preparation and planning, reflective practices and program sustainability.

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## Sustainability of Lesson Study in Basecamp F SMPN1 Tomo Sumedang District

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**Abstract:** This paper tells the story of the lesson study math -based subjects Region F SMPN1 Tomo Sumedang that consist of nine Country junior high school and 2 MTs., that still exist since the beginning of 2006 till now 2014. Despite having the same problems with other parts Sumedang , as not followed by the principal, the F region is relatively more stable with the number of participants who always face , quality of plan , implementation and reflection that continues to increase. This group (MGMP Matematika Wilayah F) can also send a representative facilitator that most good LS to the district, provincial and national level. Unique things that exist in this group include: The existence of the former school principal who continues to be active as a participant LS MGMP, many teachers are kept abreast of developments through the facilitator LS District, Provincial and National, many teachers who wrote the LS experience by following the seminar ICLs in UPI Bandung, the presence of supervisors in each meeting, and others listed in the contents of this paper that led to the LS MGMPs region F to implement a sustainable manner. Hopefully, this paper can infiration of sustainability-based LS Driven MGMPs or other schools in the area.

**Keywords:** Lessson Study Sustainability

### 1 PENDAHULUAN

Cerita lama mengenai Musyawarah Guru Mata Pelajaran (MGMP) yang berjalan hanya melaksanakan program belaka atau berjalan apa adanya karena ada proyek belaka, sudah menjadi konsumsi umum dikalangan guru dan dunia pendidikan pada umumnya. Akibatnya, peningkatan mutu guru yang diharapkan dari program tersebut jauh dari harapan. Sedangkan biaya yang dikeluarkan dari sekolah tetap berjalan dan menjadi sis-sia belaka.

Namun tentu ada juga program MGMP yang berjalan dengan baik, dalam artian program tersebut dapat meningkatkan mutu guru-guru pesertanya, sehingga biaya yang dikeluarkan oleh sekolah dapat bermanfaat untuk meningkatkan mutu gurunya sehingga pembelajaran yang dilakukan oleh guru bersangkutan dapat lebih bermakna bagi peserta didik-peserta didiknya dan akhirnya, peserta didiklah sebagai pihak yang sangat diuntungkan karena pembelajarannya lebih bermakna bagi peserta didik sebagai tujuan utama dari pendidikan yaitu memberikan pembelajaran yang terbaik bagi peserta didik sehingga peserta didik memperoleh pengalaman belajar yang berguna baginya baik untuk masa sekarang maupun untuk masa yang akan datang. Salah satu program MGMP itu adalah Lesson study berbasis MGMP Matematika yang berada di Kabupaten Sumedang Wilayah F yang sekolah *Basecamp*nya SMPN 1 Tomo.

Pelaksanaan keberlanjutan Lesson Study di Kabupaten Sumedang sangat di dukung dan difasilitasi oleh Dinas Pendidikan Kabupaten Sumedang. Dalam pelaksanaannya semua sekolah menengah pertama di Kabupaten Sumedang yang berjumlah kurang lebih 137 SMP dan MTs. Negeri dan swasta, terbagi dalam 8 kelompok Basscamp, dimana masing masing basecam beranggotakan 10 sampai 15 sekolah, karena tidak semua sekolah aktif sebagai anggota MGMP atau rutin mengirimkan guru-gurunya pada mata pelajaran tertentu.

Lesson Study Berbasis MGMP adalah wahana berkumpulnya guru-guru mata pelajaran tertentu untuk berdiskusi dan sharing pendapat mengenai pembelajaran yang dilakukannya sehari-hari melalui pengkajian pembelajaran yang direncanakan dan dilaksanakan bersama-sama. Dari kajian pembelajaran tersebut guru-guru dapat mengambil hikmah dan pembelajaran sehingga dapat digunakan untuk meningkatkan pembelajarannya masing –masing di tempat kerjanya masing-masing, sebagi tugas pokoknya sehari-hari. Pelaksanaannya 7 kali pertemuan untuk tiap semester pada hari-hari MGMP, yaitu hari hari Senin Untuk Bahasa Indonesia, Hari Selasa Bahasa Inggris dan Bahasa Sunda, Rabu untuk Matematika. Kamis untuk PAI dan IPS dan hari Sabtu untu IPA. Sedeangkan Untuk MGMP Matematika dan IPA, jadwalnya telah ditentukan oleh Dinas Pendidikan Kabupaten Sumedang.

## 2 PEMBAHASAN

MGMP Matematika Wilayah F Basecamp SMPN 1 Tomo yang terdiri dari 11 sekolah yaitu SMPN 1 Tomo, SMPN 2 Tomo, MTs.N Tomo, SMPN 1 Jatigede, SMPN 3 Jatigede, SMPN 1 Ujung Jaya, SMPN 2 Ujungjaya, MTs.N Ujungjaya, SMPN 1 Conggeang, SMPN 2 Conggeang dan SMPN 1 Buahdua, sedangkan satu MTs. Suasta Assalam sudah tidak aktif lagi, telah berjalan selama 8 tahun sejak tahun 2006 sampai sekarang tahun 2014. Tiap tiap sekolah mengirimkan 2 sampai 3 guru matematikanya sehingga peserta yang aktif ada 22 peserta.

MGMP ini sejak tahun 2006 sampai sekarang dapat berjalan dengan baik yaitu selalu dihadiri oleh pesertanya dengan tingkat kehadiran yang tinggi yaitu 80 sampai 100%. Diskusinya berjalan dengan baik karena sebagian besar peserta selalu memberikan pendapatnya dalam diskusi sehingga perencanaan pembelajaran berjalan lancar dan refleksi lebih bermakna, dalam artian setiap diskusi selalu ada ilmu yang dibawa sebagai oleh-oleh untuk meningkatkan pembelajarannya di sekolah masing-masing. Diskusi membahas mengenai materi ajar matematika sehingga dapat menambah ilmu matematika bagi pesertanya dan membahas mengenai metode dan teknik mengajar sehingga menambah wawasan para guru mengenai teknik pembelajaran yang menarik bagi siswa di sekolahnya masing-masing.

Selain diskusi membahas materi matematika dan teknik mengajarnya, sering juga terjadi diskusi membahas hal-hal lain yang dianggap perlu oleh peserta seperti mengenai masalah siswa yang tidak mau mengerjakan PR, mengenai kebiasaan siswa menyontek, mengenai penilaian Kinerja Guru (PKG) dan Pengembangan Keprofesian Berkelanjutan (PKB), mengenai pembuatan rencana dan rancangan pembelajaran yang berbeda-beda dari para ahli, mengenai pengembangan silabus dan terakhir masalah Kurikulum 2013 yang sedang dibahas pada pertemuan-pertemuan sekarang ini. Serta mendiskusikan masalah-masalah yang sedang hangat pada waktunya. Mengenai kurikulum 2013, sekarang pun kami sedang membahas mengenai pembuatan RPP yang berubah karena Permen yang baru serta sedang membahas penilaian sikap spiritual dan social, sehingga diperoleh produk penilaian sikap hasil diskusi kami.

Sedangkan jika melihat MGMP MIPA yang lain di basecamp yang lain, yang sama-sama penjadwalannya difasilitasi oleh Dinas Pendidikan Kabupaten Sumedang, misalnya MGMP IPA di basecamp yang sama, atau di MGMP matematika

wilayah lain yang pernah penulis kunjungi, pesertanya makin lama makin sedikit, sering tidak melaksanakan kegiatan sesuai jadwal yang telah ditentukan, pernyataan bosan dari pesertanya dan lain sebagainya yang menjadikan kegiatan MGMPnya seolah tidak bermakna bagi pesertanya dan hanya berjalan karena adanya jadwal dari pihak dinas.

Makalah ini akan membahas mengenai Sustainability MGMP Lesson Study yang masih terus terjaga sejak tahun 2006 sampai sekarang di Wilayah F SMPN 1 Tomo sesuai dengan pengalaman penulis dan beberapa orang peserta yang telah menjadi fasilitator. Hal tersebut dapat terjadi karena beberapa alasan sebagai berikut:

1. Adanya fasilitator yang dapat memoderasi jalannya refleksi, sehingga refleksi tidak membosankan dan dapat melihat kejadian-kejadian yang menarik untuk didiskusikan dari keseluruhan pembelajaran, bukan hanya memfasilitasi peserta untuk berpendapat.

Moderator yang seperti ini harus dapat melihat keseluruhan pembelajaran dan mencermati kejadian-kejadian yang dialami siswa seperti kenapa ada siswa dari kelompok tertentu tidak konsentrasi pada pembelajaran. Apakah karena pembelajaran tidak dapat difahami oleh siswa atau ada hal-hal lain yang membuat siswa tersebut tidak konsentrasi.

Di MGMP yang lain kelihatannya moderator hanya memfasilitasi peserta untuk berpendapat tanpa memberikan masalah yang harus didiskusikan oleh peserta, karena moderator tersebut tidak mengikuti pembelajaran dengan baik atau tidak mencermati masalah-masalah pembelajaran yang nantinya akan menjadi bahan diskusi dan menarik untuk dicarikan solusinya. Hal tersebut mengakibatkan peserta hanya menyampaikan kejadian-kejadian dalam pembelajaran tanpa ada pembahasan masalah yang perlu diselesaikan yang merupakan masalah yang sering terjadi di sekolah manapun. Sehingga peserta tidak merasa ada oleh-oleh yang akan di bawa ke sekolahnya masing-masing sebagai bahan perbaikan bagi masalahnya di sekolahnya.

Refleksi yang seperti itu membuat peserta bosan karena setiap pertemuan hanya membahas hal-hal yang itu-itu juga. Jadi tidak dapat disalahkan apabila ada guru yang berpendapat bahwa Lesson Study itu tidak bermakna dan hanya begitu-begitu saja. Itulah pentingnya moderator dalam pengkajian pembelajaran. Jika tidak dapat memoderasi dengan baik dapat mengakibatkan Lesson Study tidak bermakna

sama sekali. Jadi jadi moderator adalah tugas yang mulia yang dapat menjadikan pembelajaran yang dikaji bersama dapat bermanfaat atau tidak bermanfaat bagi pesertanya.

2. Adanya beberapa kepala sekolah yang menjadi peserta MGMP karena kepala sekolah tersebut mengajar di sekolahnya dan merasa bahwa *sharing* pendapat dengan guru-guru dapat meningkatkan pembelajarannya kepada siswanya di sekolahnya masing-masing.

Tugas utama kepala sekolah adalah mengajar karena sesuai dengan Permen 28 tahun 2010 kepala sekolah adalah guru yang memperoleh tugas tambahan sebagai kepala sekolah. Jadi karena sebagai guru maka tugas utamanya adalah mengajar atau melaksanakan pembelajaran yang berupa perencanaan, pelaksanaan dan penilaian pembelajaran. Karena kepala-kepala sekolah yang berlatar belakang pendidikan matematika di wilayah F mengajar di sekolahnya masing-masing dan ikut aktif sebagai peserta MGMP matematika, sehingga membuat guru-guru baik dari sekolah yang kepala sekolahnya sebagai peserta atau dari sekolah lain menjadi termotivasi untuk tetap aktif sebagai peserta MGMP.

Di MGMP yang lain karena tidak ada kepala sekolah yang menjadi peserta MGMP, maka guru-guru tidak merasa risikan apabila pada suatu kesempatan tidak dapat menghadiri acara MGMP walaupun telah diberi uang transportasi dari sekolahnya masing-masing. Sehingga tidak memaksakan diri atau berusaha sekuat tenaga untuk menghadiri MGMP. Dan dapat dipastikan bahwa kepala sekolah yang tidak aktif dalam MGMPnya biasanya kepala sekolah yang tidak mengajar, dalam artian tidak melaksanakan tugas pokoknya sebagai guru.

Disinilah pentingnya peran kepala sekolah untuk keberlanjutan Lesson Study. Kepala sekolah yang ikut aktif dalam MGMP akan merasa tidak rugi mengongkosi guru-gurunya ke MGMP, karena memperoleh imbalan guru-guru yang kinerjanya lebih baik dibandingkan sebelum mengikuti MGMP. Bahkan seorang ahli Lesson Study dari Thailand yang pernah menjadi Nara Sumber dalam Seminar Lesson Study di UPI Bandung berpendapat bahwa tanpa kehadiran kepala sekolah dalam acara Lesson Study dapat membuat Lesson study menjadi sia-sia belaka.

3. Adapaun penyebab-penyebab yang lain yang menyebabkan terjaganya keberlangsungan Lesson Study di Base Camp Wilayah F SMPN

1 tomo Kabupaten Sumedang adalah merupakan efek logis dari kedua factor di atas yaitu karena adanya moderator yang baik dan adanya kepala sekolah yang mengajar disekolahnya dan merasa MGMP dapat meningkatkan kemampuannya dalam pembelajaran di sekolahnya.

Penyebab lain tersebut seperti keakraban guru dan kepala sekolah, sehingga kepala sekolah menjadi lebih mudah mempengaruhi guru melalui media diskusi dan *sharing* pendapat. Hal lain adalah terciptanya keakraban guru dengan pengawas, yang biasanya hubungan antar guru dan pengawas adalah hubungan supervisor dan orang yang disupervisi menjadi hubungan rekan senior dengan rekan junior, sehingga pergaulan lebih cair dan pengawas lebih memahami kondisi guru dan guru lebih memahami kondisi pengawas. Hal itu mengakibatkan guru merasa senang apabila ada pengawas dan pengawas lebih tertantang untuk memberikan ilmu yang terbaik bagi guru-gurunya dengan kesan tidak mengajarnya, sehingga guru lebih mudah menerima perubahan dan hal-hal baru yang diperoleh dari pengawas.

Di wilayah lain, bahkan di kabupaten lain yang telah penulis pernah kunjungi MGMPnya hubungan kepala sekolah-guru dan pengawas – guru masih hubungan yang bersifat atasan dan bawahan sehingga MGMPnya berjalan kaku yang mengakibatkan guru tidak betah berlama-lama jika ada kepala sekolah atau ada pengawas. Hal ini mengakibatkan acara MGMPpun tidak berjalan karena guru merasa membutuhkan bertambahnya ilmu tetapi karena adanya kepala sekolah atau pengawa, sehingga apabila tidak ada pengawasan dari kepala sekolah atau pengawas acara MGMP tidak berjalan sesuai dengan harapan dan tidak mengakibatkan guru merasa bertambah ilmunya karena acaranya berlangsung hambar kembali.

### 3 PENUTUP

Dari uraian singkat di atas dapat disimpulkan bahwa terjaganya keberlangsungan Lesson Study Berbasis MGMP di Wilayah F SMPN 1 Tomo Kabupaten Sumedang dikarenakan guru-gurunya sebagai peserta MGMP merasa bahwa aktif dalam MGMP itu besar sekali manfaatnya dan dapat terus menerus meningkatkan pembelajarannya untuk kepentingan peserta didiknya disekolahnya masing-masing tanpa ada henti-hentinya (berkelanjutan). Hasil kajian penulis hal itu disebabkan bermakananya kegiatan pengkajian pembelajaran melalui Lesson Study berbasis MGMP dan memperoleh solusi-solusi dari

masalah-maslah yang sering dihadapi di sekolahnya masing-masing.

Fenomena di MGMP *Lesson Study* Wilayah F SMPN 1 Tomo Kabupaten Sumedang yang tidak ditemukan di *Basecamp* wilayah lain Kabupaten Sumedang dan Kabupaten lainnya yang telah penulis kunjungi adalah moderator yang memahami *Lesson Study* dengan baik sehingga dapat memoderasi pengkajian pembelajaran secara optimal dan tidak membosankan serta kehadiran dan ikut aktifnya kepala sekolah sebagai peserta MGMP karena mengajar di sekolahnya masing-masing.

Besar harapan kami terjaganya keberlangsungan *Lesson Study* di wilayah kami dapat terus berlanjut dan bias menginspirasi wilayah-wilayah lain yang keberadaanya tidak optimal. Amin



## Journey of Writing a Reflective Journal

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**Abstract:** Journey of writing a reflective journal. Learning can be achieved if one can explore themselves and know how to face challenges associated with the learning task. The article aims to explore the internal and external factors associated with confusion and difficulties of writing a reflective journal. It starts with the exploration of myself as a learner when I have to start writing my own reflective journals. I am in the state of anxiety and confusion about what to write in my reflective journals. The article also shows some evidences resulted from interviewing two international students who have learning problems with a new challenging topic. The last, this article also discusses the possibilities and issues behind using a reflective journal as a powerful tool for professional learning.

**Keywords:** journey, reflective journal, confusion, anxiety, professional learning

### 1 INTRODUCTION

Do you have any difficulties in learning a new challenging topic? Yes, everybody does have difficulties in learning but just to some extent based on strategies, motivation, behaviours, and attitudes. In addition, learning can be achieved if one can explore themselves and know how to face challenges associated with the learning task. However, in some cases, learners do not really know their own strengths and weaknesses which contribute to success in learning. Similarly, for me as an international student, I am in a condition of not knowing what to do and how to cope with new tasks; especially the task of writing a reflective journal. Thus, the purposes of this student inquiry project include looking at internal and external factors associated with confusion in writing reflective journal, exploring self as a learner, providing some evidences resulted from interviewing two international students who have learning problems with a new challenging topic. Finally, explain why a reflective journal is a powerful tool in professional learning and how it can be used in my own work context.

### 2 DATA GATHERING AND INTERPRETATIONS

#### 2.1 My Concern over the Assignments

The first session went smoothly with a lot of discussion around the term learning and professional learning. Unfortunately, I did not share ideas much, for I did not know what to express. Furthermore, confusion with reflective journal came to my minds after my lecturer introduced assignment guidelines. Several reasons which led me to confusion are first they are new to me, for instance, I consider it as new

terms even I seem to get familiar with them. Next, I have not had any experience writing a reflective journal. As I had experienced, teachers and students in my country are not required to write learning or teaching journal to reflect what they have learnt or taught in the class. In other words, majority of them do not know about the reflective journal, its importance, and way to write it. Therefore, everything is new that is why I am in the state of anxiety and confusion, especially I am not so sure where and when I should begin to write the reflective journal. Another confusion is when I led a class discussion with other students and discussed both assignments (reflective journal and action research), in fact, most of my friends were not also really clear and they did have different opinions about writing a reflective journal, so there were mixture of views came to me. As a consequence, the more I listened and read, the more I got confused with the reflective journal. “... and discover that the more I look the more I see. But I do not know how to learn from what I see” (Field, 1951 cited in Moon, 2005). For example, one student said that we just wrote our past teaching experience into our reflective journal, whereas another student did differently. As a result, I didn’t know where I had to start writing my first journal. Hertzberg (2003) asserts confusion differs from misinterpretation or miscalculation, for if one miscalculates or misinforms, then one has ideas how to go about trying to fix it, whereas being confused means that one does not know how to go on until clarification occurs.

Not only do confusions block me from writing reflective journal but also other feelings affect me such as avoidance, anxiety, frustration, and no sense of moving forwards. For example, I leave it for a while at the time I am not exactly sure from where I should start and what should be included.

Sometimes, I feel relaxed and do not put much focus on writing because I think I still have much time to write it. As a result, it wastes my time and there is no progress in writing the journal.

Hence, if I still keep thinking negatively there will be no progress and I cannot move forwards, so the ways I react in order to solve the problems first exploring myself in order to see how I can do it. Significantly, I still have motivation to complete the task, for it now becomes a challenging task. In fact, I have searched, read articles as well as written some points, but the main issue is that I seem not to have self-confidence. So it means that I need significant scaffolding to move forwards. Fortunately, communicating through email and small group discussion with other classmates, it paves me a better way to go further in writing the reflective journal. It is a kind of collaborative learning, which helps learners to move forward, for instance, Kumar (1996) states that “collaborative learning presents an environment in which a student interacts with one or more collaborating peers to solve a given problem” (p.2). Accordingly, the anxiety and confusion has lessened after several discussions with other friends in the class. From this point, I see myself as a type of learner who sometimes needs encouragement and motivation from other people so that I am capable of doing it.

From my experiences above, I attempt to interview two international students who encounter similar problems. I intentionally select two international students from Cambodia and Indonesia in order to find out the feelings towards learning new topic, factors contributed to those feelings, and how they work it out. I provide only three questions and I will record and write some notes during the interview.

1. Have you ever had the following feelings when you learn a new topic?
  - a. Confusion
  - b. Anxiety
  - c. Frustration
  - d. No sense to move forward

*The first participant is a new student from Cambodia.. The result for the first question is the student was confused and anxious about the new topic she is studying now. Meanwhile, the second participant from Indonesia who is not a new student also has encountered similar issue. Surprisingly she said “yes, I have confusion, shocked,, anxiety, and no sense of moving forwards”.*

2. What factors contributed to those feelings?
  - a. Are they from internal factors? For example, do not put more effort to do it, do not focus on the topic, no interest, do not talk to other.

- b. Are they from external factors? For example, part of the requirement, fear of failing, no encouragement from teacher, unrelated educational background, new term or not familiar with the topic, teaching methods, no time to consult with the teacher, and a big class

*The responses from both students put more emphasis on external factors. For example, the second participant said, “talking about management...how to be a good manager, leadership skills and new terms that I have not known before”. “the feelings I feel confused and anxious cause ...mmm... result from teacher who.. and from myself. From teacher I mean that usually I ...my learning experience, we need guide a lot ...a lot of guides from teachers but when we lack of the guidance from teachers we just feel that what we are going to do? So we feel like we are in the space what should I do? Teacher tells nothing ...tells nothing... that mean that some kinds of the background does not suit to me. It is new that is why we feel confused.”, said the first participant. Therefore, the internal factors do not seem influence them much, for they said they have tried their best to understand the topic but it does not help them move on.*

3. How did you work it out?
  - a. Talking to your friends
  - b. Consulting with the teacher
  - c. Trying to find it out by yourself without other advices
  - d. Searching articles related to the new topic
  - e. Reading some books related to the new topic.

*Significantly, two of them have different steps in dealing with the problems. For example, the participant from Indonesia mentioned that she would search articles related to the new topic first, then she talked to other friends who enrolled in the topic before, and if she remained uncertain she would consult with teacher. On the contrary, the other one would ask in the class if she was not clear about something, after that she would read or search books and articles, and finally she would consult with the teacher not her friends because she was not comfortable to discuss with them.*

From those answers, I can assume that some international students may meet difficulties in learning a new topic. Particularly, those difficulties are mainly from external factors such as educational background, new experience, and unfamiliar with the topic. In this sense, Dorbrovolny (2003) agrees that learners will find the course difficult if they do not have prior or relevant experiences with the instructional content. Equally, students solve their learning difficulties differently according to what

works best for them. For example, some would choose to talk with their friends first rather than turning to the lecture, whereas another would go to the teacher directly.

Based on what I faced and responses from the interview, I can identify my strengths, weaknesses, behaviours, and learning strategies. First, the positive thing to get the reflective journal done is that I am still motivated to write it during the time of my crisis. For instance, I keep discussing and sharing what I should do even though I sometimes come up with unclear descriptions. I further try to find out the answer through reading books or searching some articles. What is more, I need to force myself to complete the task otherwise I will be in crisis because I have other assignments. So, I cannot wait and keep confused for long. Meanwhile, my weaknesses may come from my behaviors, learning strategies as well as educational background. Strictly speaking, I usually keep thinking negatively about myself by the time I cannot move forwards, in other words, I may not take it seriously and keep saying not knowing what to do.

Furthermore, it may derive from my educational background, for me and some other international students are not accustomed to Australian educational systems. Additionally, my educational system tends to teach students to be dependent learners, which they need more guidance from teachers so that they can achieve the learning task. Sometimes I believe that it is not possible to meet and talk with the teacher unless I have clear visions about what I am doing. It, thus, also comes from cultural factor in which students do not get used to ask for help from teachers in case they get stuck or expect a lot of assistance from teachers.

## 2.2 How Important is a Reflective Journal for Professional Learning

After getting released from confusion and difficulties in writing the reflective journal, I now see why a reflective journal becomes an important tool for my learning and teaching context. What I get from writing the reflective journal, first of all, I have reflected my past experience and linked with the present and future situation. As Cooper (1991 cited in Moon, 2005) asserted that “We literally write our own stories, simultaneously incorporating our own future as we reconstruct our past” (p.7). Strictly speaking, my past learning experiences usually came up with a lot of confusions and no sense of moving forward, which resulted in not knowing how to construct my learning strategies effectively, but now I am getting better in recognizing our characteristics towards learning.

Next, the journal can be used as a documentation of my personal learning or teaching journey, which it will reflect what the actual outcomes are. For instance, it allows me to see myself in struggling with learning experience overseas, especially dealing with learning a new topic, which I have no background about it. In addition, I have a chance to share and express concerns over educational systems between Australia and my country, Indonesia, specifically about professional development. Finally, another aspect of writing a reflective journal is that through experiences, difficulties, and discussions with friends and other enable me to have a clear vision to plan and take action for the present and the future.

## 2.3 Possibilities and Issues behind Using a Reflective Journal in the Work Context

Basically, a reflective journal can be considered as the most powerful tool in enhancing professional learning. Therefore, as a teacher it can be used to reflect learning and teaching context. I will be able to adopt or apply a new model for my own learning and teaching strategies as what I encountered experiences and difficulties in Australia. For instance, I am now writing a reflective journal to reflect my learning, so in the future I aim to apply it with my students in my own countries. According to Mezirow’s (1990 cited in Clarke, 2003) learning occurs through learning critical self-reflection as well as using prior knowledge to comprehend a new or revised understanding of that knowledge to direct a future action. In addition, because of its importance, it is possibly effective to introduce and promote my teachers to write a reflective journal in their daily work, in other words, I can be a model to implement change in the work context so that it will enhance a learning community. Stoll, Fink and Earl (2003) point out that the main factor in the development of learning community is opportunities for everyone to learn process and understand their learning experiences. By doing this, it contributes to a sense of sharing knowledge and vision so that everyone in the organization has opportunities to learn in order to accomplish school goal.

In contrast, there will be some difficulties in introducing a new concept of writing a reflective journal in my work context. To begin with, as I have mentioned above, the task of writing a reflective journal is extremely new for me as well as everyone else in my work context, so it will takes time to introduce a new concept in the workplace. Thus, it perhaps is applicable for personal use to have self-reflection on teaching or learning. Second, my work situations, there is a problem, which people in the organization do not really have sense of belonging

and share a common goal, and as a result they do not work cooperatively. Therefore, people may not see the importance of writing a reflective journal, in other words they think that there is no use to write it, for most of the time they are not open to have a learning community to improve its organization. Finally, from cultural perspective and the working conditions, people do not really want to support or implement change. For instance, from cultural perspective if one feels comfortable in one situation, they tend not to change because they see it is not beneficial for them. However, some people are ready for change, but they feel discouraged, for everyone in the organization does not show recognition.

Although it is not easy to facilitate changes in my work context, people cannot avoid them personally and professionally. Scott and Jaffe (1989 cited in Hall & Hord 2001) proposed four stages to changes as follow:

1. *denial*: as people focus on the past and the way things were, and deny the need or desirability for a change.
2. *resistance*: as individuals consider their position and how the change will affect them personally (fear and uncertainty are not common in this phase).
3. *exploration*: as people think futuristically about the possibilities a change can bring, but are uncertain about how think will work (another word for this phase is "chaos").
4. *commitment*: as people develop a clearer focus of the change and its goal, and devise a plan to reach them. (p. 192).

Thus, there is a hope to introduce writing a reflective journal in the future through looking at the stages of changes. At the beginning of change, people may deny to a new concept, but as time passes by I hope that they will adopt it. As my friend said I cannot change the whole system completely, so what I can do is start from myself first and then other later.

### 3 CONCLUSIONS

To sum up, it is true that there are some internal and external factors in learning a new topic. Those difficulties are mainly from external factors such as educational background, new experience, and unfamiliar topic. Through a reflective journal, I am able to reflect my past experience and link with the present and future action. Also, the journal can be used as a documentation of my personal learning or teaching journey, which reflects what the actual outcomes are. The last, writing a reflective journal enable me to have a clear vision to plan and take action for the present and the future.

### 4 ACKNOWLEDGEMENTS

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# Effort to Support The Preparation of Professional Biology Teacher Candidates Through Integration Between Microteaching and Basic Skills of Teaching Course

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**Abstract:** The principles of micro-teaching were emphasized the simplification of learning and used of peers, making micro-teaching as an teaching practice activity have full of pretended and many weakness. This research was a qualitative descriptive study has involed 8 students of 6<sup>th</sup> semester on microteaching course and 35 students of 4<sup>th</sup> semester on basic skills of teaching course in Biology Education Program, Sebelas Maret University. Data collecting was used non-test technique by observation, interview, field notes, and documentation. Qualitative data were analyzed descriptively as percentages presented by diagram. The results showed: 1) Students' performance and students' motivation were increased; 2) this model have got positive responses from all subjects. Based on the results of this research concluded that the integration between microteaching and basic skills of teaching course can be conducted as an alternative solution to increased students' performance and students' motivation to support the preparation of professional biology teacher candidates.

**Keywords:** microteaching; basic skills of teaching course; professional biology teacher candidates.

## 1 INTRODUCTION

Globalization and the rapid of science and technology development, requires qualified human resources. Education is requested to produce a superior quality of learners so that they can survive productively in the face of opportunities and challenges of a globalized world. Education needs to be supported by professional teacher resources. Therefore, Faculty of Teacher Training and Education required to produce professional teacher candidates as stated in Law Teachers and Lecturers (2005). Curriculum of education institution needs to be developed so that relevant to global context.

Microteaching is one of the compulsory courses for teacher candidates in the Faculty of Teacher Training and Education, Sebelas Maret University. Microteaching is a prerequisite of material subject before teacher candidates conducting practical field experience (PPL) in real schools. By microteaching students teacher candidates are trained to teach basic skills of teaching practically simplified by using peer as the subject of teaching (student) which the number, time, teaching materials are limited. It's related with Mc. Laughlin & Moulton cit. Asril (2010) states that: "micro teaching is as performance training method designed to isolate the component part of teaching process, so that the trainee can master each component one by one in a simplified teaching situation". However microteaching practice exercise is a vehicle with a limited learning situation, but it is important for prospective teacher candidates, especially in gaining practical teaching experience.

The importance of the role of microteaching as one effort to improve the professionalism of teachers is also emphasized in the second sub-regional workshop on teacher education in Bangkok (1971) that through microteaching activities teacher candidates are expected to be ready taught in school (real class).

Teaching skills obtained in microteaching, determine the success of student teachers in implementing the program of field experience (PPL) at the school. Student teachers gain practical exercises that teach effectively in microteaching, have better preparedness. Results of interviews with school supervisors stated that teacher candidates are generally not 100% ready to teach in the real class, they mostly feel less confident. The results of interviews with teacher candidates showed that 85% they stated unconfident and they encountered many obstacles in teaching practice in the classroom (Suciati, 2012). The number of complaints of school supervisors related with teacher candidate competencies indicated that that debriefing practices through microteaching is not optimal. Integrating between microteaching course and basic skills of teaching course to create the learning situation more challenging. On the other hand, teacher candidates for basic skills of teaching course can learn a lot of things based on their observations of teacher model.

Table 1. Students’ Skills in Making Learning Instrument in Microteaching Course

Student (M)	Average Value of Student’s Skills in Making Learning Instrument			Average
	I	II	III	
M1	54	83	96	78
M2	67	88	92	82
M3	75	88	92	85
M4	79	96	100	92
M5	79	92	100	91
M6	71	92	96	87
M7	79	96	100	92
M8	79	96	100	92
Average	72	91	97	87

There are two aspects to be assessed in microteaching course namely: 1) skills of student teachers in create teaching preparation that include: syllabi, lesson plan, assessment tools, student worksheets, etc.; 2) skills in delivering learning that includes 8 aspects of basic skills of teaching by using the peer as a subject of teaching. While the basic skills of teaching courses, students besides assessed their skills in delivering the concepts by simulating the eight aspects of basic skills of teaching. Therefore, both of students will mutually beneficial symbiosis.

## 2 RESEARCH OBJECTIVES

This study aims to determine: 1) the impact of the integration of microteaching course with basic skills of teaching courses toward performance and motivation of teacher candidates; 2) to determine responses of teacher candidates on the implementation of integration courses between microteaching course and basic skills of teaching course.

## 3 RESEARCH METHOD

This study is a qualitative descriptive study involving 8 of sixth semester of students on microteaching courses and 35 students in the fourth semester of students on basic skills of teaching courses in Biology Education Department, Faculty of Teacher Training and Education, Sebelas Maret University. Collecting data using a non-test techniques through observation, interviews, field

notes, and documentation. Data were analyzed by descriptive qualitative and presented in percentages and graph.

## 4 RESULTS

The data of student’s skills in making learning instrument are presented in Table 1.

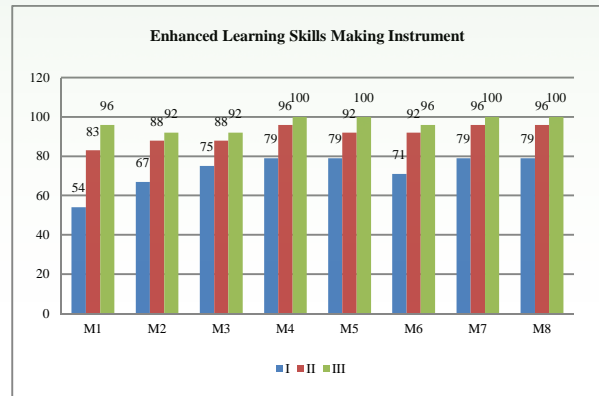


Figure 1. Enhanced Learning Skills Making Instrument

The data on Table 1 and Figure 1 showed on first assessment (I) the average value of student’s skills in making learning instrument is only reached 72, the second assessment increased to 91 and at the final assessment (III) on reaching the average value of 97. Assessment of students’ skills in making learning instrument includes six aspects: objectives / indicators, learning materials, learning procedures, teaching methods, evaluation (learning instrument), and reference source. This means that an increase in the value of the average skills of students’ teachers in making learning instrument before and after integration between basic skills of teaching course and microteaching course have enhanced. Judging from the average performance value of each teacher candidates, there are 3 students (M4, M7, M8) which has an average value of performance are very high (92). Instead at the end of the assessment (III) is the third student to obtain a perfect score (100). While at the end assessment, there are students’ achievement (M1) with average value is lowest (77). Despite the achievements of the average values in M1 showed the lowest, but the increase is very high, that is, from the first assessment to the second assessment increased by 29% and of the second assessment to the third assessment increased by 13%.

Data of students’ skills on teaching practice (performance) of each student on microteaching course are presented in Table 2 and Figure 2 below.

Table 2. Students' Skills in Teaching Practice in Microteaching Course

Student (M)	Average Value of Students' Performance						Average
	I	II	III	IV	V	VI	
M1	54	83	96	88	92	100	86
M2	67	88	83	92	96	96	87
M3	75	88	92	92	96	100	91
M4	79	96	100	96	96	100	95
M5	79	92	92	92	100	96	92
M6	71	92	92	96	100	100	92
M7	79	96	100	96	92	100	94
M8	79	96	100	100	96	96	95
Average	73	91	94	94	96	99	

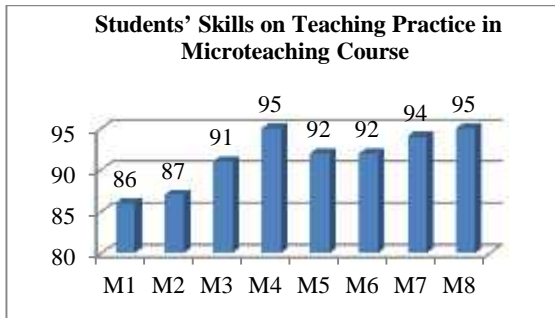


Figure 2. Students' Skills on Teaching Practice in Microteaching Course

Data in Table 2 and Figure 2 showed that the results of the assessment of students' performance in teaching practice was increased. Students' performance assessment covers eight aspects of basic skills of teaching that include skills of: asking, making reinforcement, making the variation, explaining, opening and closing lessons, guiding of students' small group discussion, managing the classroom, and to enabling students to learn. Accomplishment average value of students' performance in microteaching (M1) showed the lowest (86). While the other students (M4, M7, M8) have increased since the third assessment. In general, the average value of students' achievement (performance) indicates that all students increased. Data on motivated students are presented in Table 3 and Figure 3

Table 3. Students' Motivation in Microteaching Course

Student (M)	Average Value of Students' Motivation in Microteaching Course			Average
	I	II	III	
M1	25	50	63	46
M2	50	63	88	67
M3	50	88	88	75
M4	63	100	100	88
M5	75	75	100	83
M6	50	63	75	63
M7	67	83	100	83
M8	75	100	100	92
Average	57	78	89	

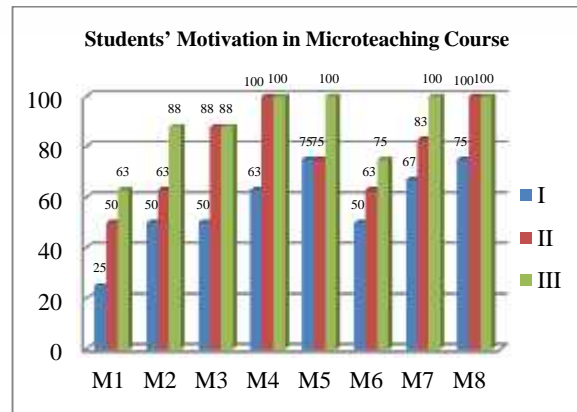


Figure 3. Students' Motivation in Microteaching Course

Based on the data in Table 3 and Figure 3 showed students' motivation in attending microteaching was increased. The lowest average on achievement is M1, while the highest average value of students' motivation reached by M8. However, with the integration between basic skills of teaching and microteaching courses in general students' motivation to be better than ever. Students' competences (skills in making learning instrument and performance) on microteaching courses are presented in Figure 4 below.

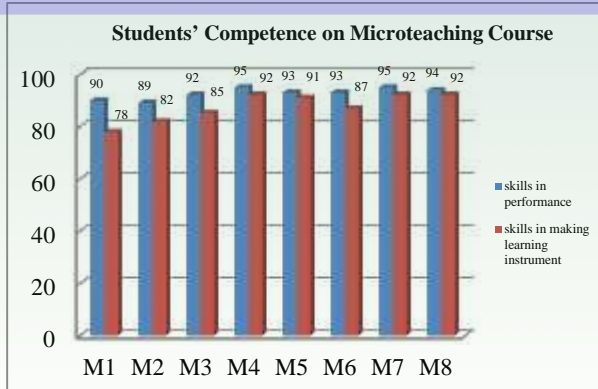


Figure 4. Students' Competence on Microteaching Course

Student responses in both subject to the application of the integration between basic skills of teaching on microteaching course presented in Table 4 below.

Table 4: Students' Responses Toward The Application of Integration Between Microteaching and Basic Skills of Teaching Courses

Course	Students' Response
Basic Skills Teaching	<ul style="list-style-type: none"> <li>✓ Useful, because obtaining a form of practical application of the basic skills of teaching theory</li> <li>✓ Getting an experiences to observe of model teacher in implementing aspects of the basic skills of teaching theory</li> <li>✓ As preparing to started in carrying forward microteaching</li> </ul>
Microteaching	<ul style="list-style-type: none"> <li>✓ Well, it can be as a self evaluation and reflection</li> <li>✓ Train to teach in front of peoples</li> <li>✓ More challenging for making preparation better</li> </ul>

## 5 DISCUSSION

In general, the results showed that the integration between basic skills of teaching and microteaching courses have positive impact on students' skills in making learning instrument and performance. This can be explained because sense of confidence in teaching can be fostered through practice performing in front of an audiences. The more often teacher candidates perform teaching in practice in front of students, it predicted making students become confident. This is relevant to the Suciati' research (2012), based on the results of interviews revealed that students experienced the peak feeling less confident when you are beginning to teach real

classes at school when implementing field experience program. As it is known that characteristics of microteaching is emphasizing mastery of aspects of basic skills of teaching by setting specific and limited (micro). The use of peer as a student in microteaching tends to be less able to create the challenging learning situations. Interaction between teacher and student learning be created in less than optimal, because it have woken psychological forces as fellow students. In addition, teaching and discussion of learning material between a teacher and students, become less challenging, because almost all questions can be answered by the students as a peer. Teaching by other observers (basic skills of teaching course) in the activities of the microteaching is expected to create new situations that are challenging for the teacher models. At least the teacher models will be challenged to better prepare themselves both materially and appearance. In the basic skills of teaching, teacher candidate are required 8 aspects of teaching both theoretically and practically. While, on microteaching courses teacher candidates demanded better prepared both in the mastery of the material as well as in performance. The integration model between basic skills of teaching and microteaching, provide benefits on both sides. They can provide the experiences by observe how aspects of basic skills of teaching can be applied in practice in learning. In the other side, students on microteaching course expected to learn from the teacher views the model, which is expected to grow a new inspiration and confidence in the teaching practice in class. It is relevant to the research Habidin (2013) that the use of a variety of innovative learning model can improve basic skills of teaching. In microteaching conventional, student teachers in teaching practice only faced limited number of study subjects that are his own friends (peer) that is less challenging. Neither the basic skills of teaching courses, students only get knowledge about aspects of basic skills of teaching theoretically.

The results also showed a positive response from students. As such, the integration between basic skills of teaching and microteaching is intended as an alternative to efforts to improve self-esteem student teachers in teaching practice.

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## Teacher Performance and Student Motivation Improvement through School-Based Lesson Study (LSBS) in SMA Negeri 1 Cipeundeuy Kabupaten Bandung Barat

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**Abstract:** To guarantee the professionalism of the teachers which stated in the constitutions, it is necessary to create a kind of sustainable teachers' training program that is oriented in improving the quality of learning. SMA Negeri 1 Cipeundeuy is one of public high school located in the suburb area in Bandung Barat which has not shown a good quality in learning. The students' learning motivation and the teachers' performance is still considerably low, most of the teachers applied one way lecturing for their teaching and learning method, the classroom interaction occurred one way from the teacher to the students, so the students had no opportunity to explore more in the teaching and learning activities. In order to solve those problems a School Action Research (SCR) of teacher training model using School-based Lesson Study was conducted by following some stages: plan, do and see and it resulted in improving teacher's performance and students' motivation in learning. Those were proven by 4 (four) cycles in this research, the mean of teachers' pedagogical competence kept on increasing. The students' opinion towards teachers' performance also increased, it was proven by the result of each cycles which showed strong agreement in the implementation of creative teaching and learning. Besides, the students' motivation shown in each cycles increased regarding to strong agreement toward their high motivation. The implication of this School-Based Lesson Study is the prominent improvement in the National Education Standard, especially in the process standard, educator standard, management standard, assessment standard, and graduate competence standard. Furthermore, it also eases the principal in performing the learning supervision, teachers' performance evaluation, completing the professional sustainable development, and developing innovative learning models.

**Keywords:** School-Based Lesson Study, Learning Supervision, Teachers' Performance, Student Learning Motivation.

### 1. LATAR BELAKANG

Abad dua puluh satu bercirikan dengan adanya perubahan ekonomi yang sangat cepat, ledakan dan kemudahan memperoleh informasi, serta pesatnya kemajuan teknologi dan globalisasi. Hal ini memungkinkan tuntutan yang cepat untuk menguasai berbagai kompetensi baru. Hal ini menuntut adanya paradigma baru dalam dunia pendidikan. Pemerintah telah mengantisipasi perubahan ini terlihat dari rencana strategis pendidikan Negara Kesatuan Republik Indonesia tahun 2010-2014 yang disebutkan ada 4 paradigma pendidikan yang harus diperhatikan yaitu :

- 1) Pemberdayaan manusia seutuhnya,
- 2) Pembelajaran sepanjang hayat berpusat pada peserta didik.
- 3) Pendidikan untuk semua.

- 4) Pendidikan untuk Perkembangan, Pengembangan, dan/atau Pembangunan Berkelanjutan (PuP3B).

Pembelajaran abad 21 harus lebih daripada hanya sekedar menjelaskan apa isi pengetahuan, tapi pembelajaran abad 21 dapat memodelkan proses pembelajaran yang dialami guru sehingga peserta didik dapat mengamati dan mempelajari keterampilan proses, keterampilan memecahkan masalah, dan keterampilan berpikir ketika mempelajari suatu pengetahuan seperti yang dianggap cukup untuk dekade abad ke 20 (Herawati, 2009: xii).

Pembelajaran abad 21 harus mampu menjelaskan bagaimana seharusnya siswa belajar dan berfikir. Pendidikan dituntut harus mampu mendeskripsikan, mendesain lingkungan dan proses pembelajaran

sedemikian rupa sehingga cara siswa belajar dan mengetahui dapat dimanifestasikan dalam kegiatan belajar yang aktif, kolaboratif, mandiri (*self-regulated*), dan terarah (*self-directed*). Peranan guru sangat penting dalam memberdayakan kemampuan berpikir peserta didik, agar peserta didik dapat menggali proses berpikir dan meningkatkan kecerdasan dalam memecahkan permasalahan dalam kehidupan nyata dalam kehidupan sehari-hari.

Pendidikan yang berkualitas sangat bergantung pada kualitas gurunya, untuk menjamin kualitas tenaga pendidik (guru) yang profesional pemerintah juga mengeluarkan Undang-Undang RI No. 14 tahun 2005 tentang Guru dan Dosen yang mengatur hak dan kewajiban Guru dan Dosen. Kompetensi pendidik sebagai agen pembelajaran pada jenjang pendidikan dasar dan menengah serta pendidikan anak usia dini meliputi: (a) kompetensi pedagogik, (b) kompetensi kepribadian, (c) kompetensi profesional, dan (d) kompetensi sosial. Khusus kompetensi pedagogik seorang pendidik harus mampu mengelola pembelajaran sekurang-kurangnya meliputi:

- 1) Pemahaman wawasan atau landasan kependidikan.
- 2) Pemahaman terhadap peserta didik
- 3) Pengembangan kurikulum/silabus
- 4) Perancangan pembelajaran
- 5) Pelaksanaan pembelajaran yang mendidik dan dialogis
- 6) Pemanfaatan teknologi pembelajaran
- 7) Evaluasi hasil belajar
- 8) Pengembangan peserta didik untuk mengaktualisasikan berbagai potensi yang dimilikinya (UU No. 19 tahun 2005).

Staf Ahli Kemendikbud Prof. Dr. Kacung Marijan, Indonesia mengalami masalah pendidikan yang kompleks. Selain angka putus sekolah, pendidikan di Indonesia juga menghadapi berbagai masalah lain, mulai dari buruknya infrastruktur hingga kurangnya mutu guru. Masalah utama pendidikan di Indonesia adalah kualitas guru yang masih rendah, kualitas kurikulum yang belum standar, dan kualitas infrastruktur yang belum memadai. Kualitas mutu pendidikan sangat ditentukan oleh pembelajaran yang dilakukan Guru di

dalam kelas, dalam menjamin keterlaksanaan pembelajaran yang efektif dan efisien harus dilakukan pengawasan dan pembinaan yang berkelanjutan (<http://positivego.blogspot.com/2012/11/>).

Hal senada dikemukakan oleh ketua PGRI pusat Prof. Dr. Sulistiyo dalam hari Guru Nasional, bahwa ada beberapa persoalan Guru yang menonjol dan tidak pernah mendapat penyelesaian, salah satunya : “pengembangan kompetensi dan karir yang tidak berjalan sesuai tujuan. Banyak guru yang telah lulus dari Lembaga Pendidikan Tenaga Kependidikan justru malah menurun kompetensinya. Untuk itu, standard kompetensi perlu disiapkan, dijaga dan dibina” (Kompas.com, 2012).

Hasil kajian awal di atas menunjukkan kinerja guru SMA Negeri 1 Cipeundeuy relatif rendah. Jumlah Guru SMA Negeri 1 Cipeundeuy sebanyak 28 orang, 46,4% merupakan tenaga honorer, 66,67% masih golongan III/c ke bawah, pengalaman mengajarnya 64% kurang dari 10 tahun dan hanya 35,7% yang sudah lulus sertifikasi. Banyaknya guru honorer, pengalaman mengajar guru masih kurang, dan jarang guru mengikuti pelatihan baik dalam MGMP ataupun kegiatan pengembangan pendidik lainnya merupakan salah satu penyebabnya. Selain itu kualitas peserta didik yang masuk SMA Negeri 1 Cipeundeuy masih relatif rendah karena masuk tanpa melalui seleksi, semua siswa diterima. Akibat rendahnya kualitas peserta didik, guru kurang mendapat tantangan dalam melakukan pembelajaran begitupun siswa tidak pernah menuntut pembelajaran yang baik dari gurunya.

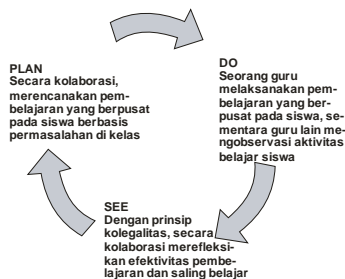
Kegiatan-kegiatan pelatihan dan pendidikan guru belum dapat merubah paradigma guru secara permanen, pembelajaran yang inovatif hanya bertahan satu atau dua bulan setelah pelatihan, selebihnya guru mengajar kembali pada biasanya hanya transfer ilmu saja. Hal ini membuat penulis bertanya, apakah ada pola pembinaan guru yang dapat membuat kinerja guru dalam pembelajaran lebih baik dan berkelanjutan?.

Sejak tahun 1998, tiga universitas di Indonesia yaitu Universitas Pendidikan Indonesia (UPI), Universitas Negeri Yogyakarta (UNY) dan Universitas Negeri Malang (UM) bekerjasama dengan JICA (*Japan International Cooperation Agency*)

mencoba untuk meningkatkan kualitas Pendidikan di Indonesia khususnya pendidikan MIPA, dengan melakukan pembinaan terhadap guru MIPA dengan program IMSTEP (*Indonesia mathematics and Science teacher Education Project*). Dalam kegiatan *piloting*, guru dan dosen berkolaboratif merancang dan mengembangkan model pembelajaran MIPA yang berbasis *hands-on activity, daily life*, dan *local materials* sesuai dengan kondisi dan permasalahan sekolah. Program tersebut dikembangkan menjadi program lanjutan dalam tahun 2003–2005, dengan melakukan insemniasi hasil IMSTEP melalui *lesson study* bekerjasama dengan MKKS dan MGMP.

*Lesson Study* adalah suatu model alternatif pembinaan guru melalui pengkajian pembelajaran secara kolaboratif dan berkelanjutan berlandaskan prinsip-prinsip kolegalitas dan *mutual learning* untuk membangun komunitas belajar. “*Lesson Study* dilaksanakan dalam tiga tahapan yaitu *plan* (merencanakan), *Do* (melaksanakan), dan *see* (merefleksi) yang berkelanjutan. Dengan kata lain *Lesson Study* merupakan suatu cara peningkatan mutu pendidikan yang tak pernah berakhir (*continous improvement*)” (Kaniawati, 2009:21).

Skema kegiatan *lesson study* diperlihatkan pada gambar 1.1



Gambar 1.1 Skema Kegiatan *Lesson Study* (Cipu, 2008:30)

Berdasarkan hasil kajian ada dua macam *lesson study* yaitu *lesson study* berbasis MGMP dan *lesson study* berbasis Sekolah (LSBS). *Lesson study* berbasis MGMP yaitu *lesson study* yang kegiatannya dilaksanakan pada kegiatan Musyawarah Guru Mata Pelajaran masing-masing. Guru-guru dari setiap gugus atau Kabupaten berkumpul disuatu tempat untuk melakukan kajian

pembelajaran bersama-sama, dengan cara merancang, melaksanakan dan merefleksi hasil pembelajarannya. Diharapkan semua guru menyadari pentingnya pembelajaran yang baik yang kreatif, aktif, efektif, inovatif dan menyenangkan dalam rangka mengembangkan potensi peserta didik. Begitupun *Lesson Study* berbasis Sekolah (LSBS) kegiatannya sama dengan LS-MGMP, yang membedakannya adalah komunitas gurunya, apabila LS-MGMP komunitas gurunya mata pelajaran yang sama se gugus atau se kabupaten sedangkan LSBS komunitas gurunya di Sekolah itu sendiri dengan mata pelajaran bervariasi.

Berdasarkan hasil *end-line survey* program PELITA (*Program for enhancing Quality of Junior Secondary Education*) yang merupakan kelanjutan program SISTTEMS yaitu program kerjasama JICA dengan Pemerintah Indonesia. Survey dilakukan di tiga kabupaten yaitu Sumedang, Bantul dan Pasuruan pada tahun 2010. Hasil survey menunjukkan bahwa melalui kegiatan *Lesson study* diperoleh hasil yang berkaitan dengan management sekolah antara lain:

- 1) Terdapat peningkatan implementasi “*school-based Teacher Development*” dalam bentuk kegiatan *open class, study group* dan pelatihan yang dilakukan oleh sekolah.
- 2) Terjadi peningkatan dalam “*supportive Atmosphere among Student*”.
- 3) Terdapat peningkatan dalam kegiatan belajar kelompok dalam menggunakan media pembelajaran dan bertukar pikiran dalam pembelajaran IPA dan Matematika.
- 4) Terjadi peningkatan pada pemahaman dan minat siswa terhadap IPA dan matematika (Kabar PELITA, 2010:1-3).

Berdasarkan kajian teori dan beberapa pendapat hasil kegiatan *Lesson Study* menunjukkan hasil yang baik dengan respon yang baik, namun hasil dan respon yang baik ini tidak menjadikan seluruh sekolah mengimplementasikan LSBS ini bahkan cenderung kegiatan ini berlangsung hanya ada proyeknya saja, setelah itu berhenti begitu saja. Berdasarkan kajian tersebut, penulis merasa terpanggil untuk meneliti sejauh mana keefektifan kegiatan *Lesson Study* ini apabila diterapkan di Sekolah tempat penulis bekerja. Sehingga apabila

*Lesson Study* ini efektif dapat meningkatkan kinerja guru, maka akan menjadi rujukan bagi sekolah-sekolah yang lain.

*Lesson Study* Berbasis Sekolah adalah kegiatan *lesson study* yang dilaksanakan di sekolah masing-masing dengan melibatkan seluruh guru di sekolah tersebut. Tujuan utama *Lesson Study* yaitu untuk :

- 1) Memperoleh pemahaman yang lebih baik tentang bagaimana siswa belajar dan guru mengajar.
- 2) Memperoleh hasil-hasil tertentu yang bermanfaat bagi para guru lainnya dalam melaksanakan pembelajaran.
- 3) Meningkatkan pembelajaran secara sistematis melalui inkuiri kolaboratif.
- 4) Membangun sebuah pengetahuan pedagogis, dimana seorang guru dapat menimba pengetahuan dari guru lainnya (Akhmad Sudrajat, 2008:1).

Menurut Akhmad Sudrajat, ada beberapa manfaat yang dapat diambil *Lesson Study*, diantaranya:

- 1) Guru dapat mendokumentasikan kemajuan kerjanya.
- 2) Guru dapat memperoleh umpan balik dari anggota lainnya.
- 3) Guru dapat mempublikasikan dan mendiseminasikan hasil akhir dari *Lesson Study*.

Banyaknya permasalahan-permasalahan di SMA Negeri 1 Cipeundeuy terutama permasalahan pembelajaran, serta dengan melihat hasil kajian kegiatan *lesson study* yang menunjukkan banyak keunggulan dalam melakukan pembinaan pada guru, maka penulis merasa penting untuk melakukan penelitian dengan inti permasalahan : Apakah kinerja guru dan motivasi belajar siswa dapat ditingkatkan melalui kegiatan *Lesson Study* Berbasis Sekolah (LSBS) ?.

Adapun pertanyaan-pertanyaan dalam penelitian ini adalah:

- 1) Bagaimanakah kegiatan *lesson study* berbasis sekolah yang sesuai dengan karakteristik guru sebagai pola pembinaan guru di SMA Negeri 1 Cipeundeuy?
- 2) Bagaimanakah peningkatan kinerja guru dalam pembelajaran di SMA Negeri 1 Cipeundeuy setelah diterapkan kegiatan *Lesson Study* Berbasis Sekolah?

- 3) Bagaimanakah peningkatan motivasi belajar siswa di SMA Negeri 1 Cipeundeuy diterapkan kegiatan *Lesson Study* Berbasis Sekolah?

## 2. METODE PENELITIAN

Penelitian ini didasari oleh adanya masalah yang dirasakan penulis ditempat penulis bekerja, yaitu tentang rendahnya kinerja guru dan motivasi belajar siswa di SMA Negeri 1 Cipeundeuy, oleh sebab itu metoda penelitian yang tepat untuk mengatasi masalah tersebut adalah metoda penelitian kualitatif dengan strategi penelitian tindakan sekolah (PTS). Penelitian ini direncanakan berlangsung beberapa siklus sampai indikator keberhasilan PTS ini tercapai dan terjadi kepuasan peneliti, dimana setiap siklus dilaksanakan sesuai dengan perubahan yang ingin dicapai, seperti apa yang telah didesain dalam faktor yang diselidiki. Untuk mengetahui awal kinerja guru dan motivasi belajar siswa dilakukan kajian pendahuluan melalui penyebaran angket dan analisis dokumen supervisi kepala sekolah, diharapkan dapat mengetahui tindakan yang tepat yang harus dilakukan dalam rangka meningkatkan kinerja guru dan motivasi belajar siswa. Dari hasil kajian pendahuluan dan kajian teori ditetapkan tindakan yang akan digunakan untuk meningkatkan kinerja guru dan motivasi belajar siswa di SMA Negeri 1 Cipeundeuy adalah pola pembinaan guru melalui kegiatan *lesson study* berbasis sekolah (LSBS). Kegiatan LSBS terdiri dari dari: kegiatan Perencanaan (*Plan*), Pelaksanaan (*Do*) dan Refleksi (*See*) sesuai dengan tahap-tahapan kegiatan *Lesson Study*.

Dengan berpatokan pada kajian pendahuluan tersebut maka dilaksanakan penelitian tindakan sekolah (PTS) dengan prosedur: (1) tahap perencanaan tindakan (*planning*), (2) tahap pelaksanaan tindakan (*action*), (3) tahap observasi dan evaluasi (*observation*), (4) tahap refleksi (*reflection*) dalam setiap siklus. Penelitian tindakan sekolah bercirikan perbaikan terus menerus sehingga mencapai indikator keberhasilan yang menjadi tolak ukur keberhasilan siklus-siklus tersebut. Setelah dilakukan refleksi yang mencakup analisa terhadap hasil pengamatan serta hasil tindakan, biasanya muncul permasalahan yang perlu mendapat

perhatian sehingga pada gilirannya perlu dilakukan perencanaan ulang untuk dilakukan pada siklus berikutnya.

### 3. HASIL PENELITIAN DAN PEMBAHASAN

Hasil penelitian diuraikan berdasarkan tahap-tahapan Penelitian Tindakan Sekolah (PTS) yang terdiri dari empat siklus, untuk siklus 1 terdiri dari tahapan berikut: 1) Tahap Kajian Pendahuluan, 2) Tahap Perencanaan, 3) Tahap Pelaksanaan, 4) Observasi dan Evaluasi, dan 5) Tahap Refleksi (*reflection*). Sedangkan siklus berikutnya hanya empat tahapan yaitu: 1) Tahap Perencanaan Ulang, 2) Tahap Pelaksanaan, 3) Tahap Observasi dan Evaluasi, dan 4) Tahap Refleksi (*reflection*).

#### 3.1 Keterlaksanaan Proses Pembinaan Guru Melalui Kegiatan LSBS

Kegiatan LSBS yang sesuai dengan karakteristik guru di SMA Negeri 1 Cipeundeuy terdiri dari kegiatan *Plan*, *Do* dan *See*, dimana guru dikelompokkan dalam setiap rumpun mata pelajaran, yaitu: rumpun MIPA terdiri dari mata pelajaran Matematika, Fisika, Kimia dan Biologi; rumpun IPS terdiri dari mata pelajaran Ekonomi, PKN, Sejarah, Geografi dan Sosiologi; rumpun Bahasa terdiri dari mata pelajaran Bahasa Indonesia, Bahasa Inggris, Bahasa Arab dan Bahasa Sunda; serta rumpun Campuran terdiri dari mata pelajaran Pendidikan Agama, Penjaskes, TIK dan BP/BK. Kegiatan *plan* dilaksanakan tiga kali, *plan* pertama digunakan untuk diskusi identifikasi permasalahan setiap mata pelajaran dan penentuan *open lesson*, *plan* kedua digunakan untuk diskusi pembuatan RPP, pemilihan *teaching material* dan pembuatan *assessment*, *plan* ketiga uji coba *teaching material* dan menyempurnakan RPP. Kegiatan *Do* dilaksanakan dua tahap, tahap pertama dilakukan *briefing* untuk memberi kesempatan guru model menjelaskan pembelajaran yang akan dilakukan dan prosedur aturan mengobservasi dan kegiatan *open lesson*. Kegiatan *Do* tahap ke dua, satu orang guru menjadi guru model dan peserta lainnya sebagai observer yang mengamati

interaksi siswa dengan guru, interaksi siswa dengan siswa dan interaksi siswa dengan bahan ajar dan bagaimana siswa mengeksplorasi pengetahuannya. Kegiatan *see* diikuti oleh semua guru yang ikut mengobservasi, menyampaikan hasil observasi pembelajaran yang difokuskan pada proses belajar siswa dan mendiskusikan saran perbaikan pembelajaran.

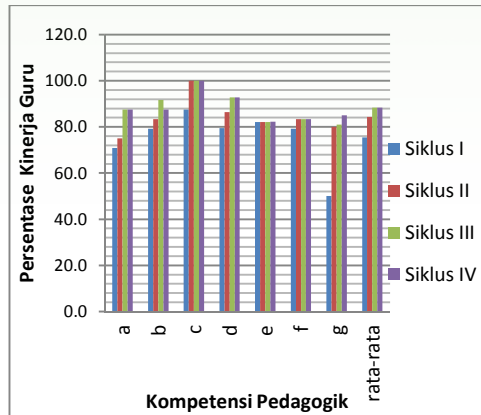
Berdasarkan hasil kajian keterlaksanaan kegiatan LSBS telah memberikan manfaat bagi guru sebagai berikut: 1) guru dapat saling belajar dalam merencanakan pembelajaran yang aktif, inovatif, kreatif, efektif dan menyenangkan, 2) guru menjadi lebih kreatif dan inovatif merencanakan pembelajaran dengan berbagai strategi dan metode mengajar, 3) guru dapat memperbaiki kesalahan dan kekurangan cara mengajar dengan melihat kesalahan dan kekurangan dari guru yang lain yang dijadikan sebagai model, 4) LSBS berhasil membentuk komunitas belajar yang dapat meningkatkan kinerja guru yang berdampak pada peningkatan motivasi belajar siswa.

Walaupun pembinaan LSBS sudah berhasil membentuk komunitas belajar guru, namun ada temuan baru bagi pengelola sekolah yang akan menjadi kendala pelaksanaan LSBS di sekolah yaitu terjadinya pembelajaran yang tidak efektif untuk kelas yang tidak dijadikan *open lesson* karena sebagian guru-guru pengajarnya melakukan observasi di kelas *open lesson*, oleh sebab itu bagi sekolah yang akan melaksanakan LSBS untuk mengoptimalkan proses *lesson study* diperlukan pengelolaan sebagai berikut:

- 1) Keterlibatan guru dalam menyusun rencana pembelajaran pada kegiatan *plan* sebaiknya ada pembagian tugas dalam mempersiapkan perangkat pembelajaran dan bersama-sama menguji coba.
- 2) Pada kegiatan *do* observer diprioritaskan guru pada rumpun mata pelajaran yang bersangkutan ditambah dengan guru-guru yang tidak mengajar pada jam itu, agar siswa yang lain tidak terganggu proses kegiatan pembelajarannya.
- 3) Pada kegiatan *see* sebaiknya diskusi difokuskan pada permasalahan pembelajaran yang ditemukan pada hasil observasi dan dibahas secara mendalam dan bagaimana seharusnya dilakukan.

### 3.2 Kinerja Guru

Profil kinerja guru yang akan dilihat adalah kemampuan guru dalam merencanakan pembelajaran, melaksanakan pembelajaran dan kemampuan guru dalam melakukan evaluasi yaitu kompetensi pedagogik. Profik kinerja guru dalam kompetensi pedagogik dapat dilihat dari grafik gambar di bawah:

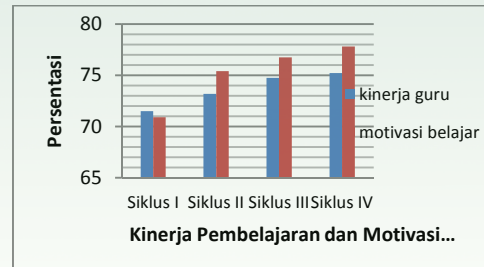


Grafik 1. Hasil Penilaian Kinerja Kompetensi Pedagogik Tiap Siklus

Dari grafik 4.14. dapat dilihat bahwa seluruh komponen kinerja guru mengalami peningkatan dari tiap siklus, kita bisa melihat peningkatan persentase rata-rata nilai kinerja guru kompetensi pedagogik, dimana presentasi rata-rata siklus I katagori cukup (75,48%), siklus II katagori baik (86,69%), siklus III katagori baik (88,34%) dan siklus IV katagori baik (88,33%). Berarti indikator keberhasilan kinerja guru sebesar 85 % dapat tercapai.

### 3.3 Kinerja Guru dan Motivasi Belajar Siswa

Untuk lebih meyakinkan peningkatan kinerja guru dan motivasi belajar siswa dari tiap siklus, maka gambar 4.15 memperlihatkan grafik hasil persentase rata-rata pendapat siswa terhadap pembelajaran yang dialaminya.



Grafik 2. Pendapat Siswa terhadap Pembelajaran dan Motivasi Belajar

Dari grafik yang diperlihatkan pada gambar 4.15 siswa berpendapat bahwa kinerja guru dalam melaksanakan pembelajaran meningkat dari tiap siklus (siklus I = 71,5% persetujuan tinggi, siklus II = 73,2% persetujuan tinggi, siklus III = 74,76% persetujuan tinggi, dan siklus IV = 75,23% persetujuan tinggi). Dari grafik gambar 4.15 pun kita bisa melihat peningkatan motivasi belajar siswa tiap siklus (siklus I = 70,93% persetujuan tinggi, siklus II = 75,33% persetujuan tinggi, siklus III = 76,77% persetujuan tinggi, dan siklus IV = 77,83% persetujuan tinggi), dengan demikian indikator keberhasilan penelitian tindakan ini tercapai melampoi skor rata-rata 75%.

Terlihat dari grafik gambar 4.16 kinerja guru dan motivasi belajar siswa memenuhi target keberhasilan, artinya pola pembinaan guru melalui kegiatan *Lesson Study* Berbasis Sekolah (LSBS) berhasil meningkatkan kinerja guru dan motivasi belajar siswa. Temuan ini sesuai dengan teori yang dikemukakan oleh peneliti sebelumnya diantaranya: menurut Sumar Hendayana (2006) bahwa kegiatan *lesson study* berhasil: 1) meningkatkan kualitas pembelajaran MIPA, 2) meningkatkan motivasi belajar siswa dalam pembelajaran MIPA, 3) Meningkatkan nilai mata pelajaran MIPA. Berdasarkan hasil *end-line survey* program PELITA (*Program for enhancing Quality of Junior Secondary Education*), bahwa kegiatan *lesson study*: 1) meningkatkan implementasi “*School-based Teacher Development*” dalam bentuk kegiatan *open class*, *study group* dan pelatihan yang dilakukan oleh sekolah; 2) meningkatkan dalam “*supportive atmosphere among student*”; 3) meningkatkan dalam kegiatan belajar kelompok dalam menggunakan media pembelajaran dan bertukar pikiran dalam pembelajaran IPA dan Matematika;

dan 4) meningkatkan pada pemahaman dan minat siswa terhadap IPA dan matematika (Kabar PELITA, 2010). Menurut Herawati, dkk *lesson study* adalah suatu bentuk utama peningkatan kualitas pembelajaran dan pengembangan keprofesionalan guru, dalam melaksanakannya guru secara kolaboratif: 1) mempelajari kurikulum dan merumuskan tujuan pembelajaran dan tujuan pengembangan peserta didiknya (pengembangan kecakapan hidupnya), 2) merancang pembelajaran untuk mencapai tujuan, 3) melaksanakan dan mengamati suatu *research lesson* (‘pembelajaran yang dikaji’) dan 4) melakukan refleksi untuk mendiskusikan pembelajaran yang dikaji dan menyempurnakannya pada perencanaan pembelajaran berikutnya” (Herawati, 2009:3).

#### 4. SIMPULAN DAN REKOMENDASI

##### 4.1 Simpulan

Berdasarkan hasil dan pembahasan penelitian yang berjudul “Peningkatan Kinerja Guru dan Motivasi Belajar Siswa melalui Kegiatan *Lesson Study* Berbasis Sekolah (LSBS) di SMA Negeri 1 Cipeundeuy Kabupaten Bandung Barat” dapat disimpulkan sebagai berikut:

- 1) Kegiatan LSBS yang sesuai dengan karakteristik guru di SMA Negeri 1 Cipeundeuy terdiri dari kegiatan *Plan*, *Do* dan *See*, dimana guru dikelompokkan dalam setiap rumpun mata pelajaran, yaitu: rumpun MIPA terdiri dari mata pelajaran Matematika, Fisika, Kimia dan Biologi; rumpun IPS terdiri dari mata pelajaran Ekonomi, PKn, Sejarah, Geografi dan Sosiologi; rumpun Bahasa terdiri dari mata pelajaran Bahasa Indonesia, Bahasa Inggris, Bahasa Arab dan Bahasa Sunda; serta rumpun Campuran terdiri dari mata pelajaran Pendidikan Agama, Penjaskes, TIK dan BP/BK. Kegiatan *plan* dilaksanakan tiga kali, *plan* pertama digunakan untuk diskusi identifikasi permasalahan setiap mata pelajaran dan penentuan *open lesson*, *plan* kedua digunakan untuk diskusi pembuatan RPP, pemilihan *teaching material* dan pembuatan *assessment*, *plan* ketiga uji coba *teaching material* dan menyempurnakan RPP. Kegiatan *Do* dilaksanakan dua tahap,

tahap pertama dilakukan *briefing* untuk memberi kesempatan guru model menjelaskan pembelajaran yang akan dilakukan dan prosedur aturan mengobservasi dan kegiatan *open lesson*. Kegiatan *Do* tahap ke dua, satu orang guru menjadi guru model dan peserta lainnya sebagai observer yang mengamati interaksi siswa dengan guru, interaksi siswa dengan siswa dan interaksi siswa dengan bahan ajar dan bagaimana siswa mengeksplorasi pengetahuannya. Kegiatan *see* diikuti oleh semua guru yang ikut mengobservasi, menyampaikan hasil observasi pembelajaran yang difokuskan pada proses belajar siswa dan mendiskusikan saran perbaikan pembelajaran.

- 2) Kinerja guru kompetensi pedagogik dalam pembelajaran meningkat setelah diterapkan kegiatan LSBS di SMA Negeri 1 Cipeundeuy, terbukti persentase rata-rata nilai kinerja guru kompetensi pedagogik siklus I (75,48%) kategori cukup, siklus II (83,70%) kategori baik, siklus III (87,30%) kategori baik, dan siklus IV (88,33%) kategori baik, begitupun pendapat siswa terhadap kinerja pembelajaran guru meningkat dengan persetujuan tinggi di tiap siklus, terbukti pada siklus I (71,5%) , siklus II (73,2%), siklus III (74,8%), dan siklus IV (75,7%).
- 3) Motivasi belajar siswa di dalam pembelajaran meningkat setelah diterapkan kegiatan LSBS di SMA Negeri 1 Cipeundeuy, terbukti persentase rata-rata motivasi belajar siswa dengan persetujuan tinggi di tiap siklus, siklus I (70,93%), siklus II (75,33%), siklus III (76,67%) dan siklus IV (77,73%).

#### 5. REKOMENDASI

Permasalahan rendahnya kinerja guru dan motivasi belajar siswa bukan saja dialami oleh SMAN 1 Cipeundeuy tetapi juga dialami oleh sekolah pada umumnya, untuk mengatasi masalah tersebut berdasarkan hasil penelitian ini maka direkomendasikan sebagai berikut:

- 1) Bagi Dinas Pendidikan Pemuda dan Olahraga kabupaten Bandung Barat:
  - a) *Lesson Study* Berbasis sekolah (LSBS) dapat dijadikan alternatif



pola pembinaan guru berkelanjutan di lingkungan disdikpora kabupaten Bandung Barat dalam rangka meningkatkan kinerja guru dan motivasi belajar siswa.

- b) Keberhasilan LSBS dalam meningkatkan kinerja guru dan motivasi belajar siswa, seyogianya kepala dinas pendidikan menerapkan kegiatan *lesson study* di MGMP melalui LS MGMP dan di setiap sekolah melalui LSBS.
- 2) Bagi kepala Sekolah seyogianya menjadikan LSBS sebagai alternatif pola pembinaan guru berkelanjutan dalam menjamin profesionalisme tenaga pendidik dan meningkatkan pelayanan pembelajaran yang aktif, inovatif, kreatif, efektif dan menyenangkan. Selain itu LSBS dapat memudahkan pekerjaan kepala sekolah yaitu: melakukan supervisi pembelajaran, melakukan penilaian kinerja guru (PKG), pengembangan keprofesionalitas berkelanjutan (PKB) dan mengembangkan model-model mengajar yang inovatif dalam menyambut kurikulum 2013.
- 3) Bagi Guru dalam membentuk komunitas belajar LSBS sangat tepat untuk meningkatkan pengetahuan, keterampilan dan sikap menjadi guru profesional dan memberi kesadaran dalam memperbaiki pembelajaran yang berkelanjutan.
- 4) Bagi peneliti selanjutnya:
  - a) Meneliti dampaknya pada keberhasilan hasil belajar melalui penerapan *Lesson Study* Berbasis Sekolah (LSBS).
  - b) Meningkatkan kompetensi guru dalam mengembangkan pembelajaran berbasis kurikulum 2013 melalui manajemen *Lesson Study* Berbasis Sekolah (LSBS).

## Pengalaman Berharga Dari Lesson Study Bagi Guru-Guru IPA di Kabupaten Subang

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**Abstrak:** *Lesson Study* merupakan sarana untuk perbaikan pembelajaran yang dilakukan secara kolaboratif berdasarkan langkah-langkah : *perencanaan (plan)*, implementasi rencana pembelajaran tersebut di dalam kelas/*open class (do)* dan kegiatan *refleksi* yaitu diskusi tentang hal-hal yang terjadi pada proses pembelajaran di kelas (*see*). Hal lain yang terpenting dalam kegiatan *Lesson Study* adalah keberlanjutan proses belajar yang dilakukan guru-guru dalam upaya meningkatkan kualitas pembelajaran sehari-hari sebagai upaya untuk mencapai tujuan pembelajaran secara umum. Inti dari *Lesson Study* adalah open class, yang dilakukan oleh *guru model* dan diamati oleh guru-guru lain sebagai *observer/pengamat*. Ada 3 pedoman observasi dalam open class, yaitu : 1) Apakah siswa belajar dan bagaimana prosesnya? 2) Adakah siswa yang tidak belajar dan mengapa dia tidak belajar? 3) Bagaimana upaya guru mengatasi siswa yang tidak belajar? Pengalaman berharga yang dapat diperoleh dari open class bukan hanya bermanfaat bagi guru model saja tapi juga bagi guru observer. Ketajaman dan kedalaman observer dalam melakukan pengamatan akan sangat menentukan kualitas diskusi saat refleksi dan akhirnya dapat memperbaiki kualitas pembelajaran berikutnya. Paper ini akan memaparkan pengalaman berharga yang diperoleh dari pelaksanaan kegiatan *Lesson Study* di MGMP IPA Komisariat Jalcagak Kabupaten Subang selama 3 tahap yang merupakan *Implementasi Lesson study dalam Program Hibah Kompetensi berbasis Institusi (PHKI)* yang diselenggarakan atas kerja sama Dinas Pendidikan Kabupaten Subang, Dinas Pendidikan Propinsi Jawa Barat dan Universitas Pendidikan Indonesia (UPI). Beberapa pengalaman maupun pelajaran berharga yang didapatkan antara lain : 1) Guru dapat berkolaborasi dan bertukar pikiran dalam merencanakan pembelajaran/pembuatan design pembelajaran (*plan*). 2) Sebagai forum belajar bersama (belajar dari pembelajaran) dari kekurangan maupun kelebihan pada waktu open class. 3) Hasil refleksi dapat digunakan untuk perbaikan design pembelajaran berikutnya (*redesign*). 4) Guru model dapat mengetahui kekurangan pada saat open class sehingga dapat memperbaiki pembelajaran berikutnya. 5) Observer mendapat pengalaman/pelajaran dari pembelajaran yang dilakukan guru model (misal teknik mengajar yang pas atau media maupun cara mengatasi siswa yang tidak belajar). 6) *Lesson Study* dapat dijadikan wahana supervisi Kepala Sekolah dalam melaksanakan program *Penilaian Kinerja Guru (PKG)* dan *Pengembangan Keprofesian Berkelanjutan (PKB)*.

**Kata kunci :** pengalaman berharga, *lesson study*

### 1 PENDAHULUAN

Kemajuan suatu bangsa tercermin dari mutu sumber daya manusianya. Sedangkan sumber daya manusia (SDM) ditentukan oleh mutu pendidikan. Berdasarkan Balai Pusat Statistik tahun 2005 Index Pembangunan Manusia (IPM) Propinsi Jawa Barat menempati peringkat ke-14, jauh di bawah DKI Jakarta (peringkat ke-1) dan Daerah Istimewa Yogyakarta (peringkat ke-4). Rendahnya IPM tercermindari rendahnya mutu kehidupan bermasyarakat. Sebagai contoh, masyarakat kita sedang mengalami krisis budaya, baik budaya bersih, budaya tertib, budaya tatakrama dan budaya tepat waktu. Di mana-mana kita lihat sampah berserakan, air sungai kotor dan tercemar akibat ulah masyarakat yang membuang limbah. Krisis budaya tatakrama terlihat dari sikap anak sekarang banyak yang bersikap kurang sopan ke guru/orang tua atau terjadinya tawuran antar pelajar. Budaya antri dengan tertib susah diterapkan, semua ingin lebih dulu mendapat jatah yang kadang dapat menimbulkan musibah. Keterlambatan menjadi hal

biasa, terlambat masuk kerja, terlambat hadir rapat, maupun di suatu acara/event. Itu sebagian kecil contoh krisis budaya yang harus diperbaiki secara kontinyu melalui pendidikan.

Usaha pemerintah dalam rangka meningkatkan mutu pendidikan salah satunya, Undang-Undang Guru dan Dosen Nomer 14 tahun 2005 yang merupakan acuan tentang guru/dosen profesional. Undang-undang tersebut menuntut penyesuaian penyelenggaraan pendidikan dan pembinaan guru agar menjadi profesional. Pengakuan terhadap guru/dosen profesional diberikan manakala guru/dosen telah memiliki kualifikasi akademik, kompetensi dan sertifikat pendidikan yang dipersyaratkan (Pasal 8). Kualifikasi akademik harus "diperoleh melalui pendidikan tinggi program sarjana atau diploma empat"(Pasal 9). Sertifikat pendidik diperoleh guru setelah mengikuti pendidikan profesi (Pasal 10 ayat 1). Adapun jenis kompetensi yang dimaksud Undang-undang tersebut meliputi "kompetensi paedagogik, kompetensi kepribadian, kompetensi sosial dan kompetensi profesional". Sedangkan dalam

Peraturan Pemerintah RI No 19 Tahun 2005 tentang Standar Nasional Pendidikan berbunyi sebagai berikut :

1. Proses pembelajaran pada satuan pendidikan diselenggarakan secara interaktif, inspiratif, menyenangkan, menantang, memotivasi peserta didik untuk berpartisipasi aktif, serta memberikan ruang yang cukup bagi prakarsa, kreatifitas, dan kemandirian sesuai bakat, minat dan perkembangan fisik serta psikologis peserta didik.
2. Selain ketentuan sebagaimana dimaksud pada ayat (1), dalam proses pembelajaran pendidik memberikan keteladanan.
3. Setiap satuan pendidikan melakukan perencanaan proses pembelajaran, pelaksanaan proses pembelajaran, penilaian proses pembelajaran untuk terlaksananya proses pembelajaran yang efektif dan efisien.

Untuk mengimplementasikan UUGD serta PP 19 tahun 2005, pemerintah selalu melakukan usaha, salah satunya meningkatkan mutu guru melalui pelatihan. Sayangnya usaha pemerintah ini belum sepenuhnya memberi dampak yang signifikan terhadap mutu guru. Menurut Sumar Hendayana et al. (2006) minimal ada dua hal penyebab pelatihan guru belum berdampak pada peningkatan mutu pendidikan. Pertama, pelatihan tidak berbasis pada permasalahan nyata di kelas. Materi pelatihan disamakan tanpa mengenal daerah asal. Dengan kata lain bersifat *top down*, bukan *bottom up* berasal dari permasalahan nyata yang dialami guru. Kedua, hasil pelatihan hanya menjadi pengetahuan saja, tidak diterapkan pada pembelajaran di kelas atau kalaupun diterapkan hanya sekali, dua kali dan selanjutnya kembali "seperti dulu lagi, *back to basic*". Hal ini terjadi karena tidak ada monitoring setelah pelatihan, apalagi kalau kepala sekolah tidak pernah menanyakan hasil pelatihan, juga tidak memfasilitasi forum sharing pengalaman antara guru-guru (MGMP di sekolah).

## 2 PENGERTIAN LESSON STUDY

Untuk mengatasi kelemahan pelatihan konvensional yang kurang menekankan pada pasca pelatihan maka ditawarkan model *in-service training* yang lebih berfokus pada upaya pemberdayaan guru yang sesuai kapasitas serta permasalahan nyata di kelas. Juga dapat dijadikan alternatif untuk pembinaan bagi guru yang sudah lulus sertifikasi dan sekaligus dapat digunakan untuk Penilaian Kerja Guru (PKG) serta Pendidikan Keprofesional Berkelanjutan (PKB). Model tersebut adalah *Lesson Study* yaitu suatu **model pembinaan profesi pendidik melalui pengkajian pendidikan pembelajaran secara kolaboratif dan berkelanjutan berlandaskan**

**prinsip-prinsip kolegalitas dan mutual learning untuk membangun komunitas belajar.** Bila kita cermati dari definisi *Lesson Study* kita menemukan 7 kata kunci yaitu pembinaan profesi, pengkajian pembelajaran, kolaboratif, berkelanjutan, kolegalitas, *mutual learning*, dan komunitas belajar. Jadi *Lesson Study* bukan suatu model/metode pembelajaran tapi merupakan proses kegiatan pengkajian pembelajaran secara kolaboratif, berkelanjutan yang bertujuan untuk meningkatkan mutu pembelajaran. Menurut Suparlan (2010) di web-nya, guru yang tidak pernah mau pernah berusaha meningkatkan kompetensinya akan menjadi guru yang "beku".

*Lesson Study* telah berhasil dilakukan di Jepang dan berkembang di Indonesia mulai tahun 1998 melalui IMSTEP (Indonesia Mathematics and Science Teacher Educations Project) dan JICA (Japan International Cooperation Agency). Pelaksanaan *Lesson Study* meliputi tiga tahap yaitu:

1. **Plan (perencanaan)** : merancang pembelajaran meliputi *materi ajar, teaching material (hands on)*, strategi pembelajaran dan menentukan siapa yang berperan sebagai *guru model*. Model pembelajaran yang dikembangkan berbasis *hands on activity, dayly life dan local material*.
2. **Do (Pelaksanaan)**: implementasi rencana pembelajaran di dalam kelas/*open classyng* merupakan inti dari *Lesson Study*. Walaupun pada saat pembelajaran hadir sejumlah observer /pengamat, guru hendaknya tetap melaksanakan proses pembelajaran sealamiah mungkin. Jadi *open class* bukan *pertunjukan mengajar* tapi merupakan sarana/wahana untuk kita kaji proses pembelajarannya/sebagai bahan refleksi di tahap berikutnya. Observer tidak boleh melakukan intervensi apapun terhadap siswa maupun membantu guru model. Mereka hanya melakukan pengamatan sesuai dengan fokus masing-masing. Ada tiga pedoman observasi dalam open class : 1). Apakah siswa belajar dan bagaimana prosesnya 2). Adakah siswa yang tidak belajar? 3). Bagaimana upaya guru mengatasi siswa yang tidak belajar?. Beragamnya latar belakang pengetahuan observer yang hadir dalam suatu kegiatan *Lesson Study* merupakan kelebihan tersendiri karena fokus perhatian serta pemahaman tentang proses yang terjadi oleh masing-masing observer juga akan sangat beragam yang dapat memperkaya khasanah pengetahuan masing-masing pihak terutama pada saat terjadinya proses refleksi.
3. **Refleksi(see)**: diskusi tentang hal-hal yang terjadi pada proses pembelajaran. Kegiatan proses pembelajaran dan akan dijadikan acuan saat mengajukan pendapat atau masukan

terjaga akurasi karena masing-masing masih bisa mengingat dengan baik rangkaian aktivitas yang barusan dilakukan di kelas. Kegiatan ini dipandu oleh fasilitator atau Kepala Sekolah dan nara sumber /tenaga ahli biasanya berasal dari Perguruan Tinggi. Guru model mengawali diskusi dengan menyampaikan kesan-kesan pembelajaran yang baru dilaksanakan. Selanjutnya observer/pengamat diminta menyampaikan temuan/masukan terutama menyangkut aktivitas siswa bukan untuk mengevaluasi guru. Di samping itu observer juga dapat mengambil pelajaran/hal-hal yang positif dari pembelajaran yang sudah dilaksanakan oleh guru model. Diharapkan diperoleh kritik dan saran yang bermanfaat demi perbaikan proses pembelajaran sehingga dapat meningkatkan mutu pendidikan. Mengapa pengkajian pembelajaran harus dilakukan secara terus menerus, karena beberapa alasan seperti yang dikemukakan Sumar Hendayana et.al (2009:15) antara lain : 1).Tidak ada pembelajaran yang sempurna, selalu ada celah untuk memperbaikinya 2). Setiap siswa memiliki hak belajar 3).Pembelajaran harus memperhatikan keseimbangan antara peningkatan kemampuan berpikir dan peningkatan sikap 4).Pembelajaran harus berpusat pada siswa

### 3 PENGALAMAN BERHARGA DARI LESSON STUDY BAGI GURU-GURU IPA DI KABUPATEN SUBANG

Pelaksanaan *Lesson Study* di Kabupaten Subangdimulai semester 2 tahun ajaran 2009/2010, merupakan implementasi *Lesson Study* dalam Program Hibah Kompetisi berbasis Institusi (PHKI) yang diselenggarakan atas kerja sama Dinas Pendidikan Kabupaten Subang, Dinas Pendidikan dan Universitas Pendidikan Indonesia (UPI).*Lesson Study* di Kabupaten Subang meliputi mata pelajaran Matematika, IPA, IPS, Bahasa Indonesia dan Bahasa Inggris.

Berikut ini pemaparan pengalaman berharga/*best practice* yang diperoleh dari pelaksanaan *Lesson Study* di MGMP IPA SMP Komisariat Jalancagak Kabupaten Subang selama tiga tahap ( tahun 2010-2012). *Lesson Study* MGMP IPA Komisariat Jalancagak diikuti 13 sekolah (SMP/MTsN) se-wilayah Jalancagak dan kurang lebih 20 guru.

Kegiatan dipandu :

Fasilitator : Yaumi Basuki, SPd (SMP N 2 Jalancagak) bergantian dengan Dasum Saripudin, SPd (SMP N 1 Jalancagak)

Nara sumber : Drs. Pasaoran, MPd dosen Program Fisika UPI.

Penulis, sebagai pengurus (Sekretaris MGMP IPA Komisariat Jalancagak) periode 2009-2013, dan pernah sebagai guru model juga.

Tahap 1 (Semester 2 tahun ajaran 2009/2010), ada 4 pertemuan, **plan** di pertemuan ke satu), tahap 2 (semester 2 tahun ajaran 2010/2011, semester 1 tahun ajaran 2011/2012,ada 10 pertemuan, **plan** di pertemuan ke-1 dan ke-6), sedang tahap 3 (semester 2 tahun ajaran 2011/2012) ada 4 pertemuan, **plan** di pertemuanke-1). Plan dilaksanakan di sekolah inti di SMP Negeri 2 Jalancagak.

Tabel 1. Kegiatan *Lesson Study* MGMP IPA Komisariat Jalancagak tahap I

No.	Nama Sekolah	Nama Guru	Waktu	Topik
1.	SMP N 1 Jalancagak	Dasum Saripudin, SPd	24-10-2020	Listrik Statis
2.	SMP N 1 Kasomalang	Walis Ratnengsih, SPd	07-11-2010	Sist. Peredaran Darah
3.	MTsN Cisolak	Khotimatus S, S	21-11-2010	Asam,Basa dan Garam

Tabel 2. Kegiatan *Lesson Study* MGMP IPA Komisariat Jalancagak tahap II

No	Nama Sekolah	Nama Guru	Waktu	Topik
1.	SMPN 2 Jalancagak	Yaomi Basuki, SPd	21-05-2011	Periskop
2.	MTSn 1 Kasomalang	Dian Kusumawati, SPd	11-06-2011	Sistem Eskresi (Ginjal)
3.	SMPN 1 Cisolak	Juhaeni, SPd	13-08-2011	Pengukuran
4.	SMPN 1 Sagalaherang	Yayan Nurjaman, SPd	17-09-2011	Sistem Gerak
5.	SMPN 1 Ciater	Suprapti, SPd	15-10-2011	Makanan dan Fungsi
6.	SMPIT Asyifa	Elis Sulastri, SPd	29-10-2011	Pemuaiian Zat
7.	SMPN 2 Tanjungsian	Reva Rimatusodiq, SPd	12-11-2011	Ciri-ciri Makhluk Hidup
8.	SMPN 1 Kasomalang	Romlah Zulkaedah, SPd	26-11-2011	Reaksi Kimia

Tabel 3. Kegiatan *Lesson Study* MGMP IPA Komisariat Jalancagak tahap III

No.	Nama Sekolah	Nama Guru	Waktu	Topik
1.	SMPN 1 Jalancagak	Dra. Ema Romayati	29-11-2012	Pewarisan Sifat
2.	SMPN 2 Jalancagak	Titi Wahyuni, SPd	13-10-2012	Sistem Pernafasan
3.	SMPN 1 Tanjungsian	Yeti Suryawati, MPd	10-11-2012	Kalor (Azas Black)

Kegiatan *Lesson Study* setiap tahapannya diawali dengan **plan** yaitu merancang persiapan untuk pembelajaran meliputi *materi ajar, teaching material (hands on)*, strategi pembelajaran dan menentukan siapa yang berperan sebagai *guru model*. Di awal memang susah untuk menentukan guru model, dengan alasan guru :

1. merasa belum siap dalam mengimplementasikan pembelajaran berbasis siswa aktif
2. belum siap/malu untuk dilihat oleh temannya / observer pada saat mengajar
3. belum siap untuk diberi masukan/saran maupun kritik dari teman observer.

Pada tahap ini kami secara kolaborasi membuat perangkat pembelajaran antara lain :

- 1) Rencana pembelajaran yang berkembang menjadi chapter design yang lebih simple dan jelas langkah/sintaks pembelajarannya.
- 2) LKS (Lembar Kerja Siswa) atau petunjuk praktikum (jika menggunakan praktikum)
- 3) Media atau alat peraga, jika tidak tersedia di laboratorium sekolah, akan dicari alternatif dengan memakai bahan lokal (*local material*) yang ada di sekitar kita.
- 4) Alat penilaian proses dan hasil pembelajaran
- 5) Lembar observasi pembelajaran



Gambar 1. Suasana *Plan* yang dibimbing oleh dosen sebagai nara sumber



Gambar 2. Peserta membuat rancangan pembelajaran (*Plan*)

Tahap berikutnya dilaksanakan **Do**/pelaksanaan implementasi pembelajaran/*open class* yang jadwalnya sudah ditentukan pada saat plan. *Open class* dilaksanakan di sekolah tempat guru model mengajar. Selain kita dapat belajar dari pembelajaran yang dilakukan para peserta merasa senang dapat berkunjung ke sekolah lain, melihat lingkungan/suasana baru. Sebelum dimulai *open class*, guru model menyampaikan pemaparan Rencana Pembelajaran/chapter design yang akan dilaksanakan, model, strategi apa yang dipakai dan hal-hal lain yang dirasa perlu untuk disampaikan. Fasilitator juga menyampaikan aturan/tata tertib bagi observer yang melakukan pengamatan



Gambar 3. Pembukaan oleh Kepala Sekolah pada tahap *Do (Open Class)*



Gambar 4. Pemaparan Rencana pembelajaran oleh guru model sebelum *Open class*

Pada tahap 2 tidak selalu didampingi oleh nara sumber di setiap pertemuannya/di selang-seling. Memang dalam setiap kegiatan *Lesson Study* tidak selalu harus ada nara sumber dari perguruan tinggi atau dari expert (tenaga ahli), namun jika ada juga lebih baik untuk memantapkan dan memverifikasi pendapat atau saran dari para peserta.



Gambar 7. Penyampaikan materi oleh guru pada *Open Class*



Gambar 5. Posisi *observer* saat *open class*



Gambar 8. Guru memberi pengarahan pada kelompok



Gambar 6. Kegiatan *observer*, yang tidak mengganggu proses kegiatan belajar mengajar



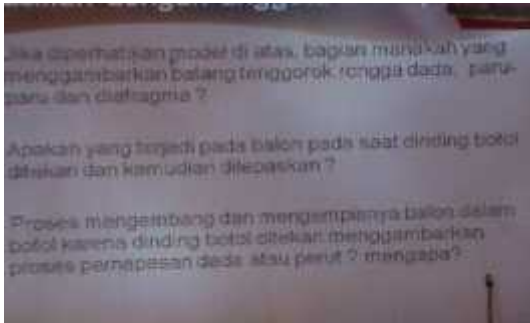
Gambar 9. Guru membimbing kerja kelompok



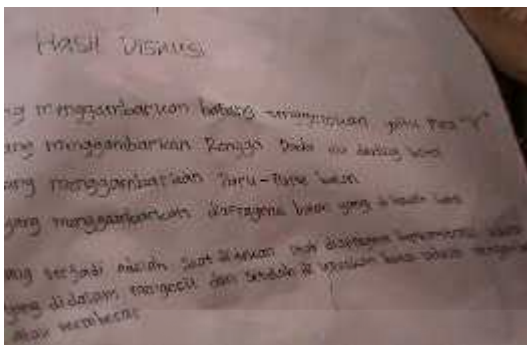
Gambar 10. Siswa sedang presentasi di depan kelas



Gambar 11. Suasana diskusi kelas



Gambar 12. Lembar Kerja Siswa



Gambar 13. Hasil Diskusi Siswa



Gambar 14. Hasil Kerja Siswa



Gambar 15. Hasil Refleksi Siswa

Selesai kegiatan pembelajaran siswa diminta menuliskan kesan dan apa yang dirasakan pada pembelajaran saat itu (refleksi siswa).

Begitu selesai *open class* dilanjutkan **refleksi**. Menurut pengakuan para guru model pada umumnya, di awal pembelajaran merasa gugup/groggi karena banyaknya observer yang mengamati, tapi lama kelamaan sudah merasa biasa dan enjoy lagi. Hal ini juga dirasakan oleh siswa, apa lagi yang baru dipakai pertama *open class*, tapi mereka senang karena pembelajarannya menarik dan menyenangkan. Berikut ini pengakuan/kesan Bu Reva Rimatussodiq, SPd sewaktu jadi guru model : "Senang karena pada saat diskusi mendapat masukan dari teman guru /observer kekurangannya di mana, sehingga dapat memperbaiki pembelajaran berikutnya.

Pada awal kegiatan *Lesson Study* banyak guru pengamat yang lebih terfokus pada cara guru mengajar, misalnya bahasa penyampaian materi yang rumit/sulit dimengerti, materi kurang lengkap, aperepsi terlalu lama, alokasi waktu yang tidak sesuai RPP, perlunya guru memberi perhatian lebih pada kelompok siswa tertentu, persiapan guru kurang, instruksi guru kurang jelas dan lain-lain. Namun setelah dijelaskan oleh fasilitator maupun nara sumber maka pengamatan guru lebih terfokus pada proses belajar siswa di kelas. Hal ini terlihat pada saat refleksi. Pengamat memberi masukan tentang siswa yang bermasalah pada saat pembelajaran, baik masalah kecakapan, kesulitan bekerja sama, kesulitan konsentrasi atau sering

memicu keramaian kelas. Kemudian secara bersama didiskusikan untuk dicari solusinya. Banyak pengalaman berharga juga di dapat oleh guru observer tentang hal-hal positif dari pembelajaran oleh guru model baik dari cara/teknik mengajar, model/strategi atau media yang digunakan, apalagi bagi guru yang latar belakang bidang pendidikan yang berbeda, misal yang dari program Fisika akan mendapat pengalaman waktu melihat pembelajaran Biologi ataupun sebaliknya. Di sinilah terlihat adanya pengkajian pembelajaran secara *kolaboratif* berdasarkan prinsip *kolegalitas* dan *berkesinambungan*, sehingga terjadi *mutual learning* (saling belajar) untuk membangun *komunitas belajar*.

Para peserta yang tergabung dalam MGMP IPA antusias mengikuti *Lesson Study* menyangkut permasalahan nyata di kelas sehingga dapat dipakai/diterapkan di sekolah masing-masing. Selain itu juga tidak monoton setiap MGMP berkutat dengan urusan administrasi seperti pembuatan RPP, pembuatan soal seperti yang sudah berjalan.



Gambar 16. Refleksi yang diawali penyampaian kesan waktu pembelajaran oleh guru model

Berikut ini beberapa *pengalaman berharga* yang kami dapat dari *Lesson Study* yang telah dilaksanakan.

1. Pada topik sistem peredaran darah dapat dilakukan dengan cara simulasi dan dibuat syair dan dilagukan, walaupun pembelajaran pada open class waktu itu belum maksimal. Syairnya :  
*Serambi kanan → bilik kanan → ke paru-paru → serambi kiri → bilik kiri → seluruh tubuh*
2. Pada topik Sistem Ekskresi /Ginjal, penyampaian materi yang menarik dengan cara dibuat syair dan lagunya (lagu seperti lagu Sedang apa). Syairnya :

*Glomerulus-Simpai Bowman ada di dalam kortex terjadi filtrasi lalu masuk ke tubula. Tubula proximal → lengkung Henle → lalu tubula distal terjadi reabsorpsi lalu ke tubula kolekta. Dari pelvis*

*lalu masuk ureter ditampung di kandung kemih keluar lewat uretra*

3. Penggunaan *local material*/materi lokal untuk media pembelajaran seperti :
  - a. Pembuatan Periskop dengan memakai pralon PVC/dus dan kaca.



Gambar 17. Siswa membuat periskop dari dus dan kaca



Gambar 18. Siswa menggunakan periskop hasil kerja kelompoknya

- b. Penggunaan betadin untuk mengganti lugol pada uji makanan dan memakai wadah bekas es krim dan pengaduknya untuk mengganti lumpang dan alu porselen (Pada topik Makanan dan fungsinya).



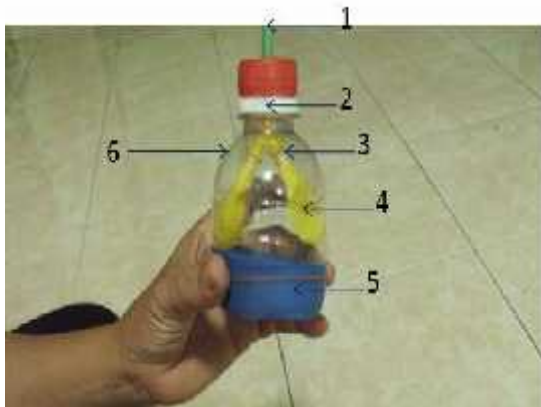
Gambar 19. Siswa sedang praktek menguji makanan





Gambar 20. Siswa sedang menerangkan hasil uji lemak

- c. Pembuatan model paru-paru dengan balon dan bekas botol minuman



Gambar 21. Model Paru-paru: 1.rongga hidung  
2.trakea 3.bronkus 4.paru-paru 5. diafragma  
6.rongga dada



Gambar 22. Saat balon biru (diafragma ditarik) balon kuning (paru-paru) mengembang terjadi inspirasi, jika dilepas balon kuning akan mengempis kembali (ekspirasi)

4. Pada penyampaian Pemuainan Zat menggunakan metode eksperimen :
- a. Meletuskan balon menggunakan balon yang disiram berbagai macam zat cair (air, minyak putih) untuk diarahkan pada konsep zat padat dapat memuai jika dipanaskan.

- b. Mengarahkan konsep zat memiliki koefisien muai lebih besar akan memuai lebih cepat dengan menggunakan 3 botol kecil/bekas yakult yang diisi cairan berbeda (air, minyak dan alkohol) yang diberi sedotan bening dan mulut botol dirapatkan dengan vaselin/lilin. Ketiga botol tersebut masing-masing diletakkan di wadah/baskom terbuka lalu baskom kita isi air panas dengan volume yang sama. Kecepatan muai dapat dilihat dari naiknya cairan pada sedotan.



Gambar 23. Kecepatan naiknya cairan di sedotan antara alkohol, minyak dan air

5. Pada topik Reaksi Kimia, untuk membuktikan :
- a. Adanya perubahan warna dan suhu : mencampur air dan obat luka lalu ditambahkan tablet vitamin C
- b. Adanya gas, endapan dan perubahan suhu: mengisi balon dengan soda kue, lalu memasang ujung balon ke ujung botol plastik yang sudah diisi asam cuka. Kemudian menumpahkan soda kue dalam botol tersebut ke dalam balon yang sudah berisi cuka.



Gambar 24. Balon mengembang ketika terjadi campuran soda kue dan asam cuka, botol terasa hangat dan ada endapannya

6. Dalam pengelompokan siswa harus beragam dan seimbang baik gender maupun kemampuan. Harus ada leader/ketua dan pembagian tugas yang jelas.
7. Penegasan dari nara sumber (Drs. Pasaoran S, MPd).

Dalam mengambil kesimpulan dari percobaan harus berdasarkan *data* jangan interpretasi b. Pada proses pembelajaran jangan biasakan berbicara dengan pemenggalan kata

Akhirnya kembali kepada diri kita masing-masing apakah mau atau tidak, berniat meningkatkan profesionalisme dan berusaha menjadi guru ideal yang mempunyai performance antara lain :

1. Bersungguh-sungguh melakukan persiapan pembelajaran dan berusaha mengimplementasikan rencana pembelajaran yang telah direncanakan.
2. Mendorong dan membantu siswa agar dapat belajar
3. Melakukan evaluasi/penilaian atas efektifitas dan efisiensi pembelajaran yang dilakukan
4. Kemauan untuk berkembang, melakukan inovasi pembelajaran sehingga dapat meningkatkan mutu pendidikan serta dapat membangun karakter siswa /sumber daya manusia contohnya di Jepang seperti yang diungkap Ali Mustadi (2013), yang sudah mengamalkan nilai-nilai karakter seperti disiplin waktu, ramah dan hormat termasuk dengan orang yang belum dikenal, jujur dan tanggung jawab, bahkan ada momen di beberapa sekolah siswanya belum pulang sebelum lingkungan sekolahnya bersih, sehingga siswa mengepel semua lantai sekolah, sebuah fenomena yang langka di negeri ini.

#### 4 KESIMPULAN

Dari kegiatan *Lesson Study* di MGMP IPA dapat disimpulkan beberapa pengalaman maupun pelajaran berharga yang didapatkan, antara lain :

1. Guru dapat berkolaborasi dan bertukar pikiran dalam merencanakan pembelajaran/pembuatan design pembelajaran (*plan*).
2. Sebagai forum belajar bersama (belajar dari pembelajaran) dari kekurangan maupun kelebihan pada waktu open class.
3. Hasil refleksi dapat digunakan untuk perbaikan design pembelajaran berikutnya (*redesign*).
4. Guru model dapat mengetahui kekurangan pada saat open class sehingga dapat memperbaiki pembelajaran berikutnya.
5. Observer mendapat pengalaman/pelajaran dari pembelajaran yang dilakukan guru model (misal teknik mengajar yang pas atau media maupun cara mengatasi siswa yang tidak belajar).
6. *Lesson Study* dapat dijadikan wahana supervisi Kepala Sekolah dalam melaksanakan program *Penilaian Kinerja Guru (PKG)* dan

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## Lesson Study on ICT-Integrated Lessons: *The Singapore Context*

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**Abstract:** According to Lewis and Hurd (2011: 3), Lesson Study is a simple idea with complex process. It provides an on-going method to improve instruction based on observations of students and their work. However, Lesson Study is not a quick fix. It is a slow and steady means of instructional improvement. It is very useful especially in researching ICT integrated lessons because only if done well, ICT has the ability to enhance students' learning, engage and motivate them. Hence, Lesson Study was conducted for 50 primary and secondary schools that implemented 10'M Programme, an ICT integrated programme for the teaching and learning of Mother Tongue Language, specifically Malay Language. This programme was initiated by Educational Technology Division (ETD) of Singapore Ministry of Education (MOE). As part of the professional development provided to teachers in the programme, 10'M Mentors worked closely with 10'M teachers to ensure the appropriate integration of ICT. The 10'M Mentors took the role of knowledgeable others in the Lesson Study conducted. This paper discusses the processes and findings of the Lesson Study conducted. Besides discussing the observations and improvements made to lesson design, students' learning, 10'M/ICT integration, classroom management, and subject content, this paper will also be sharing the processes adopted and customised to situations unique to Singapore context such as small number of classes for each level of the Malay Language class. As such, the Lesson Study has to be conducted in the following patterns: (a) 1 Teacher 1 Class; (b) 2 Teachers 2 Classes; (c) 3 Teachers 3 Classes; (d) 1 Teacher 2 Classes; and (e) 3 Teachers 1 Class. Each pattern has its strengths and weaknesses, thus, contributed to the extent of improvements observed. These strengths and weaknesses will also be discussed in this paper.

**Keywords:** lesson study, mother tongue language, ICT (information and communication technologies)-based lesson, teachers' professional development

### 1 INTRODUCTION

Teachers need to improve their skills if they want to do a good lesson even if they have good lesson plan or good textbooks. And, one good way to improve teachers' teaching skills is to do research lesson (Lewis, 2002, p. 22). This approach called Lesson Study provides an ongoing method to improve instruction based on observations of students and their work. Teachers in the research team would first formulate the goals for student learning and long-term development. They would collaboratively plan the lesson, which is the research lesson, before conducting the research lesson. One team member would be teaching whilst others gathering evidence on student learning and development. The evidence gathered would be discussed. Findings from the research lesson would then be used to improve the lesson, the unit, and instruction more generally.

This approach was conducted for all primary and secondary schools that implemented 10'M Aksara programme in 2013. This programme promotes the integration of ICT in the teaching and learning of Malay Language. It leverages on the affordances of technology. These affordances have the ability to create possibilities for students to learn at their own pace, to be self-directed learners, and to

work with each other and by doing so, learn from one another. This paper attempts to show that technology, particularly ICT, has the ability to transform the way students learn if done correctly. Therefore, to ensure the correct integration of ICT, teachers in this programme were guided and mentored by 10'M Mentor in pedagogical approaches, lesson design, and assessment. Lesson Study was conducted so that the 10'M teachers can collaboratively work towards improving their teaching skills.

### 2 BACKGROUND OF 10'CMT

Introduced in 2008, 10'CMT is a teaching and learning programme that fronts innovative ICT use for engaged learning to promote pupils' interest and hone their skills in Mother Tongue Languages such as Chinese (C) Language, Malay (M) Language, and Tamil (T) Language. The 10'CMT programme makes the most of the opportunities offered by ICT in achieving student-centred learning environment. It enhances the teaching-learning process by providing interactive learning experience that can be customised to cater to different learning abilities. In addition, this programme fosters self-paced

independent learning and provides opportunities for collaborative learning.

The 10'CMT pedagogical approach incorporates a 2-1-1 structure that represents 50% of teacher teaching time, 25% of students' practice time, and 25% of students' output time. The time set aside for students promotes self-paced independent learning during curriculum time. This helps to further student's own effort to acquire knowledge. This is further enhanced by the one to one computing environment. Each student works individually and collaboratively online.

Teachers in the programme can also leverage on the affordances of an array of ICT tools that enable individual and collaborative work to be conducted comfortably online. Teachers can set differentiated tasks for students to customise to their learning needs. Through thoughtful design of the 10'CMT lesson, students are given: (1) ample time for online reading and self-construction of knowledge; (2) ample opportunities for self-improvement before evaluation; and (3) appropriate avenue for online collaboration through peer editing, online rubrics for self-peer-teacher evaluation and peer-to-peer comments and feedback. This programme has the ability to increase students' interest and motivation to learn the Mother Tongue Languages.

### 3 LESSON STUDY

Lesson Study is an approach adopted in Japan before it is widely used in America. This research depends heavily on collaboration amongst teachers in schools. It entails the requirement for teachers to discuss and plan the lesson plan, teach based on the lesson plan whilst being observed by other teachers in the team. After which, the teachers will reflect on the teaching based on their observation. The particular lesson, known as the research lesson, will go through refinement before it can be re-taught to another group of students.

According to Lewis and Hurd (2011, p. 3), Lesson Study is a simple idea with complex process. The key to this approach is collaboration in every aspect. This will include identifying the goal, planning the research lesson, teaching and observing the lesson, discussion on the findings and refinement to be made to the research lesson.

Fang and Kim-Eng (2010) researched on Lesson Study in 2006 and 2007. The objective was to observe how this approach could increase teachers' learning and improve their teaching. The two years research involved teachers from primary schools in Singapore and researchers from the National

Institute of Education (NIE), Singapore. Their findings confirmed that Lesson Study was able to improve teaching continuously. In addition to that, teachers felt the ownership of the lesson. The teachers agreed that more time was needed to conduct Lesson Study and therefore, support from school leaders was helpful.

### 4 10'M LESSON STUDY

More than 50 primary and secondary schools embarked on the 10'M programme in 2013. This is a 5-fold growth in number since 2010 when the programme was first introduced. The programme started with just 10 schools in 2010. As part of the professional development provided to teachers in the programme, 10'M mentor works closely with 10'M teachers to ensure the appropriate integration of ICT. The Lesson Study approach was adopted in 2013 to collaboratively improve the instructions and at the same time, develop the 10'M teachers professionally.

The usual practice of improving teachers' instructions is to conduct the research lesson and improve on it during the post conference session. The refined lesson will be conducted on another group of students. Further refinement will be made and conducted on another group of students or kept for future use or reference. However, in Singapore, the number of Malay Language students per level may not be big enough to form more than one class. Hence, for schools with only one class, the exact research process described earlier could not be carried out.

Therefore, some tweaking of the standard research lesson process is needed. This resulted in the research lesson being conducted in several patterns according to the number of classes and teachers the lesson study learning community has. Therefore, guided by the programme mentor, who also acted as the knowledgeable other in the research, the Lesson Study was conducted in the following pattern:

#### 4.1 Pattern A: 1 Teacher 1 Class

This pattern is dominant. It consisted of one teacher teaching only one class. There were other teachers in the research team but the lesson was conducted by only one teacher to a group of students. Refinement was made but the refined lesson was not re-taught because the group of students is the same. The teacher, however, implemented the strategies and

ideas formulated during the post-conference or reflection stage into the newly design lesson.

#### 4.2 Pattern B: 2 Teachers 2 Classes

This pattern took place when there were two groups of students of the same level. Each group of students was taught by a different teacher. The teachers and other research team members collaborated in the planning of the research lesson. The first teacher started the research by teaching her class based on the planned lesson. The second teacher and other members of the team observed the teaching. Refinements were made during the reflection session and the second teacher re-taught the refined lesson to the second group of students. Post-conference would follow and the refined research lesson would be further refined and kept for future use.

#### 4.3 Pattern C: 3 Teachers 3 Classes

This pattern took place when there were three groups of students of the same level. Each group of students was taught by a different teacher. The teachers and other research team members collaborated in the planning of the research lesson. The first teacher started the research by teaching her class based on the planned lesson. The second and third teachers, along with other members of the team, observed the teaching. Refinements were made during the reflection session and the second teacher re-taught the refined lesson to the second group of students. Observation by the first and third teachers, and also members of the team took place and refinements were made during the reflection session before the third teacher re-taught the second refined lesson to the third group of students. Post-conference would follow and the second refined research lesson would be further refined and kept for future use.

#### 4.4 Pattern D: 1 Teacher 2 Classes

This pattern occurred when the same teacher taught two groups of students of the same level. The teacher and other research team members collaborated in the planning of the research lesson. The teacher started the research by teaching her first class based on the planned lesson whilst being observed by other members of the team. Refinements were made during the reflection session and the same teacher re-taught the refined lesson to the second group of students. Post-conference would

follow and the refined research lesson would be further refined and kept for future use.

#### 4.5 Pattern E: 3 Teachers 1 Class

This pattern occurred when three different teachers taught the same group of students. Collaboration in planning of lesson took place before the first teacher taught the students. Observation and refinements were made but because there was only one class, the refined lesson was not re-teach. However, strategies and ideas formulated during the post-conference or reflection stage were implemented into a newly design lesson. The new lesson was taught by the second teacher to the same group of students. Observation and refinements took place. The refined research lesson was not re-teach. Lessons learned from the second research lesson were implemented during the design of another new research lesson. After which, the third teacher taught the same class based on the newly designed research lesson. This particular lesson would also go through refinement during the reflection stage and kept for future use.

### 5 DISCUSSION

Each Lesson Study pattern has its strengths and weaknesses, thus, contributed to the extent of improvements observed. For teachers who conducted the Lesson Study in Pattern A and D, they were the ones who improved the most in their instructions because they conducted the first research lesson, improved on it, and then conducted the refined research lesson again. These teachers benefitted the most because of the second opportunity to teach the research lesson.

On the other hand, students in Pattern A and E benefitted the most because they received the teaching of a refined research lesson. For students in Pattern B, C and D, the second and third group benefitted more than their peers in the first group, which is the first research lesson because they received lessons that have gone through refinement.

Teachers in Pattern B, C and E, however, were the most collaborative group because they observed each other's lesson and provided inputs excessively. They were usually very focus during lesson observation and always aimed to deliver a better lesson than the first research lesson conducted by their peers. Besides that, lessons designed by these groups of teachers were always very interesting and creative.

Besides discussing the strengths and weaknesses of the different Lesson Study pattern, this paper also discusses the observations and improvements made to instructions that integrate ICT. The research lessons were conducted for lessons that taught speaking skills, reading skills that included reading aloud and reading comprehension, writing skills and grammar knowledge to groups of seven-year-olds to ten-year-olds primary school students and thirteen-year-olds secondary schools students in Singapore. These Malay Language students were learning the language in a computer-enhanced environment, namely the 10'M Programme. This paper attempts to extract the observations and improvements of the lessons in the following areas.

### 5.1 Lesson Design

10'M lesson should be organised in a 2-1-1 structure that represents 50% of teacher teaching time, 25% of students practice time, and 25% of students' output time. Majority of the lessons observed were conducted in this structure. Generally, in the 50% teacher teaching time structure, students were involved in think-pair-share activities where students work in pairs to discuss, find answers or solutions, and exploiting on students' real life experiences. Students were given ample practice and production time. However, occasionally, teachers spent more time in the teacher teaching time. The usual activities that disrupted the allotted time were the tuning-in and the induction where singing and game activities took longer than expected. This had a snowball effect on the whole structure of the lesson. It resulted in leaving the teachers with no or not enough time to summarise or conclude the lessons. During the reflection stage, it was suggested that the tuning-in and lesson inductions be simplified by way of reducing the number of time the students were allowed to sing, and the number of task that the students have to complete in the game segment. There were vast improvements in the second research lesson observed. Teachers were able to evaluate students' work as a class, summarise and conclude the lessons well.

### 5.2 Students' Learning

Generally, students were excited throughout the lesson. They participated keenly in the activities crafted for them, watched the videos earnestly, and putting up their hands to ask or answer questions, and provide feedback or comment. They showed

their understanding by their ability to re-tell stories read, watched or heard. They were able to comprehend the passages that they read by answering comprehension questions regarding the texts. Majority of them were also able to complete the tasks given to them by the teachers. Occasionally, the students had difficulty in understanding the teachers' instruction. They were not able to execute the tasks given as instructed. One example will be when students were unsure of how to log into the portal and access the correct folder in the portal. This usually happened to new users of the 10'M portal where instructions were given verbally. It resulted in time wasting as the students grappled to navigate the portal.

During the post-conference, it was suggested that teachers provide clear instructions by way of preparing in advance, the screen capture of the relevant interface, or going through the navigation once with the students before they started working on their computers. Another example would be the difficulties the students faced in answering comprehension questions and writing compositions and reflections. Observers concluded that not enough scaffolding was given, thus the confusion. Passages for reading comprehension were not discussed; structure to write or speak was not provided. It was suggested that all passages read should be discussed for understanding and teachers could apply the asking words of 5W1H (who, what, where, when, why, how) in understanding a passage, preparing a speech, and writing a composition. Reflections should be guided by way of informing the students in what areas that they could reflect on. It was observed that when the refined lessons were taught, students were able to complete the tasks more confidently. They were also able to edit their peers' work more efficiently and confidently.

### 5.3 Integration of 10'M/ICT

“Student computer expertise can supplement the limited availability of the teacher. Moreover, as inherent feature of the technology is that work in progress on the screen is public in a way that paper on a student's desk is not” (Cazden, 2001, p. 109). With appropriate integration of ICT into lessons, students' learning is enhanced. From the research lesson, it was observed that most teachers could integrate the 10'M portal well into their lessons. They were able to use suitable template for the teaching of language skills and grammar. Besides the affordances of the 10'M portal, the teachers were able to leverage on other open tools such as Google

Share to conduct sharing of ideas. The 10'M portal was optimised. Affordances like editing tools, rubrics attachment for self, peers and teacher evaluation, and comment section for providing feedback, were utilised.

However, there were instances where the portal was used for the purpose of writing composition only. During the reflection session, it was suggested that the writing of composition must be followed by self and peers evaluation by means of either the use of rubric, comment or stars. After which, students could be taught to use the editing tool to edit their peers' work. With the integration of technology, technical issues did arise. It was observed that the experienced teachers would quickly find alternative and solutions. However, for teachers who were new to the programme, they needed more time to rectify the situation. Some suggestions were given during the post-conference should the same technical issues happen. It was observed that all the teachers were better prepared in handling technical issues in their subsequent lessons.

#### 5.4 Classroom Management

Generally, 10'M teachers could manage the classroom well. Teachers were very patient in helping students with their questions and troubleshooting the computer system whenever technical issues arise, going from one computer station to another. Students were trained to waive paper cups, ice-cream sticks or paper lollipops should they need any assistance. Students were generally well behaved and followed instructions.

However, there were few instances when students became super excited after an exciting tuning-in or games. The excitement was evident throughout the lesson and the teachers found it difficult to calm them down. It was noted during the reflection stage that when left without intervention, the excitement became a classroom management problem. Students could not stop talking and they started 'visiting' each other at their computer station. It was then suggested that the teachers must ensure that the students have calmed down before going to the next stage of the lesson. When applied, the classrooms became more manageable and students' learning time was increased.

Time management is also a factor of classroom management. Time management was well executed by many teachers. Students were told the exact duration allotted to them when working at their computer and it was observed that most students abided by the time given. In classes where allocation

of time was not given or students took longer time to complete their tasks, some planned activities could not be completed. It was suggested during the post-conference that students needed to learn to work within a time frame given. But this would also mean that ample time should be given to students to complete the task given to them. Whenever it was observed that the duration given was too short or too long, adjustments were made during the reflection stage.

#### 5.5 Subject Content

Research lessons included the teaching and learning of language skills and sub-skills. Students were taught listening skills, speaking skills, reading skills and writing skills. In addition to that, students were also taught the Malay grammar. In general, the lessons were much focused on one language skills or grammar knowledge. The teachers were able to plan activities relevant to learning the skills or grammar knowledge. However, improvements were suggested in the area of scaffolding. This domain is closely related to the students' learning domain. With proper scaffolding, students were able to grasp the language skills and grammar knowledge well.

One example would be the use of first person in a reading comprehension passage for a group of seven-year-olds. Without enough explanation and scaffolding, the students could not understand the concept of 'writer' that was used in the reading comprehension question. They had difficulty relating the 'I' in the comprehension passage with 'the writer' in the question given. It was suggested in the reflection stage that the concepts be scaffold or the comprehension passage used third person as the main character in the reading comprehension passage. The team had chosen the later and vast improvement was observed in the students.

Besides this, the criteria and descriptions used in the rubric for self and peer evaluations also required explanation and scaffolding. It was observed that when explained and scaffold, the students had a better understanding of the benchmarking and were able to evaluate objectively and more accurately. In addition to that, students' understanding increased when words that were assumed to be difficult were spotted on and discussed with students. Deeper discussion and ample examples on grammar concepts also helped to make learning easier.

## 6 CONCLUSIONS

Lesson Study is definitely simple but challenging. The process is intricate and time consuming. In addition, it requires some adaptation to customise and suit situations unique to Singapore context such as small number of classes for each level of the Malay Language class. However, the end result is encouraging. The 10'M teachers have shown improvement in their instructions and they have developed professionally. They are more confident in integrating ICT into their lessons and have integrated ICT well. With better instructions, students' learning has increased and they were able to leverage ICT for self-paced, self-directed and collaborative learning. Students' ability to do self and peers evaluation has also improved because they have a better and deeper understanding of the criteria and descriptions in the rubrics used. The 10'M teachers were satisfied with their students' progress and with their own learning throughout the collaboration. The teachers' learning is aligned with that of the teachers in Japan who practised Lesson Study, that is a successful research lesson does not depend so much on what happens in the research lesson itself but also what the teachers learned from working with their colleagues (Lewis, 2002, p. 34).

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## Differences between A Teacher’s and Children’s Recognition to Classroom Rules

### *The Process of Removing the Differences in a Fifth Grade Class*

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**Abstract:** “Classroom rules” embody a way of life for teachers and children in class. Classroom rules put the abstract aims of schooling into concrete patterns for daily activities. In Japan, it has been stated that there are differences between a teacher’s and a child’s recognition of classroom rules in fifth and sixth grade classes. Such as, some teachers recognize that some classroom rules are important, but some children do not recognize them as such. However, these differences have not been analyzed from the standpoint of the children, nor academically. This study was designed to investigate differences between a teacher’s and child’s recognition of classroom rules. In order to examine how these differences are related to children’s adjustment to their classroom, and to analyze how these differences can be addressed within the class, four kinds of questionnaires were distributed to both the teacher and the children. The authors observed the fifth grade classroom for three months and analyzed the rules qualitatively. The following results emerged from the analysis: (1) There were five kinds for categorization of the classroom rules, (2) there were four types of differences between the teacher’s and children’s recognition, the existence of the rules, the degree of importance, the priority, and the purpose, (3) the differences of recognition of the classroom rules (degree of importance) negatively influenced the children’s adjustment to their classroom, (4) one possible solution to negotiate the differences in the recognition of the existing classroom rules was to create new rules with the involvement of both the teacher and the children. It is possible that classroom rules can be changed by teacher-child interaction in classes to address differences in perception of classroom rules. It was also suggested that these differences should be addressed because they may cause maladjustment for children.

**Keywords:** classroom rules, differences of recognition, elementary school, negotiation.

## 1 THE QUESTION AND THE PURPOSE

### 1.1 Features of Classroom Rules

According to Shultz et al.(1983) and Arima (2000), there are some rules related to learning and interaction that children are required to follow in classroom. When children are accustomed to the rules, behavior of the children and the teacher gets patterned (Broomstrom, 1991), and that can make children’s learning outcomes increased (Gaddy, 1988). Some researchers said that it is very important to introduce rules in classroom management (Brophy, 1983; McGinnis, Frederick, & Edwards, 1995).

Introduction of classroom rules has been found soon after children enter elementary schools, from April to July (Kagawa and Yoshizaki, 1990; Arima, 2001; Shimizu and Uchida, 2001). During this

period, teachers explicitly instruct the way children behave in class many times. It is because teachers expect that children can adapt to classroom instruction as soon as possible, and that teachers can go on teaching smoothly.

After this period, the rules are instructed only when they are broken. Researchers observed that rules were instructed implicitly, not explicitly, over the second graders’ classes (Arima, 1999, 2000; Hori, Maruno, & Kato, 2002).

Researches on classroom rules such as mentioned above have tried to identify the implicit rules. For instance, Arima (1999; 2000) identified some implicit rules which can make classroom instruction go on smoothly by observing that teachers give children advices or praise them in class.

## 1.2 Problem of Differences of Recognition to Classroom Rules

In recent years, it has been noted that recognition of keeping rules seems to be different between teachers and children in upper graders' classes. Fuchikami (2009) found that there were some teachers with stress of not going on class smoothly because several children sometimes broke the rules. It can be said that it is necessary to review methods for solving the recognition gap between teachers and children.

Several methods for solving the problem have been found by researchers. For example, a teacher explicitly instructs the rule to a child who don't keep it. A teacher explains the rule to children (Kishino and Muto, 2005). And a teacher demonstrates how to behave to follow the rule (Matsuo and Maruno, 2007). In previous literature, there seems to be an agreement that these methods can be a solution for differences of recognition.

However, it seems that we have to consider other four kinds of problems in the studies; limited participants, unclear definition of differences, a lack review of influence of differences, and inadequate review of the hypothesis.

First, in previous studies on differences of recognition to classroom rules between teachers and children and the solution, it can be said that the major participants were teachers. One of the studies identified classroom rules conducting interviews with teachers and observation teacher's behavior in class (e.g. Arima, 1999; 2000). It seems to be necessary that we investigate how children recognize classroom rules as well as teachers.

Second, features of differences of recognition to classroom rules have not been clearly defined in previous literature. It may be because surveys on awareness of differences of recognition have been conducted, which participants were only teachers (e.g. Fuchikami, 2009). So it cannot be defined not only how children recognize the rules but also how children recognize the differences. At the same time, it is important to analyze the data both quantitatively and qualitatively to define the features. On quantitative aspects, researchers have analyzed and reviewed the degrees of importance of differences of recognition with the surveys. On the other hand, qualitative aspects have been left to investigate, such as purposes and reasons for setting classroom rules.

Third, how differences of recognition influence to children has not been investigated. Although it may be not difficult for us to imagine that differences can influence to classroom atmosphere or children to some extent, few investigation have been conducted. Fuchikami (2009) noted that differences of recognition could cause teachers stress. However, it is possible that the stress were not caused by

differences of recognition directly. It cannot be pointed out that it is necessary for only teachers to solve differences based on such kind of studies. If it is investigated that differences of recognition negatively influenced to children, the purpose of resolving differences can be clearly brought up.

Finally, it is necessary to reconsider the hypothesis which claims classroom rules cannot be changed. In previous literature, two solutions for the problems have been found. One is that a few children who had broken the rules turned to follow them. The other one is that such children understood the importance of following the rules. However, Dewey (1916) claimed that rules should be changed by negotiation between a teacher and children in democratic classroom. So it can be said that it is important that classroom rules are also changed undergoing such a process as mentioned above. More importantly, to review whether differences of recognition can be removed or not accompanied by the process is needed in the field of studies on resolving differences of recognition.

## 1.3 Purpose of the Study

Based on previous literature review, the purposes of this study were as follows: (Study 1) to analyze what kind of rules were in the classroom and to what extent the teacher and children recognized the rules were important, (Study 2) to clarify how differences of recognition to classroom rules between the teacher and children influenced to children, especially children's "feeling of adaptation to school" (Emura and Okubo, 2012), "feeling of trust teachers" (Nakai and Shoji, 2006), and "classroom climate" (Ito and Matsui, 2001), and (Study 3) to analyze the process how differences of recognition were resolved and the conditions from the data of observation classes.

## 1.4 Participants

In this study, children in a fifth grade class and their homeroom teacher in a public elementary school in Tokyo were the participants. It was because Fuchikami (2009) pointed out that differences of recognition were found in the upper grade classes. The period of the study was from October to December in 2012. Anonym was used with all participants in the study.

The homeroom teacher was Mr. Fujimoto, who was in the seventh years of teaching, and he had worked at the same elementary school since he started teaching. He worked as a homeroom teacher in the upper grade classes several times. In the previous year, he taught children in the sixth grade class. He seemed to put emphasis on communication among children. When we interviewed with him, after school on November 1<sup>st</sup> in 2012, he said, "I

want children keep their honesty and friendship in the future.”

In the classroom, there were thirty-two children, nineteen boys and thirteen girls. When the school year started April in 2012, classes of the fifth grade children were composed. In September 2012, a child went to another school and a returned child came to the school from China. There seemed to be some boys who inspired other children in the class. They raised their hands and uttered something many times in class. Sometimes the teacher gave some of the children advice about their postures. It seemed that no one deviated such as walking around during the class.

## 2 STUDY 1: IDENTIFICATION OF DIFFERENCES OF RECOGNITION TO CLASSROOM RULES BETWEEN THE TEACHER AND CHILDREN

### 2.1 Purpose

In Study 1, firstly, the purpose was to identify what rules were and what types of rules were in the class (pre-exam). Secondly the purpose was to clarify differences and agreement of recognition to classroom rules which were identified. They were analyzed from the viewpoint of priority of classroom rules (analysis 1), and of the aims and reasons of rules (analysis 2).

### 2.2 Pre-Exam: Identification Rules in Class

#### 2.2.1 Purpose

In pre-exam, the purpose was to clarify how children were required to behave in class to identify differences of recognition to classroom rules.

### 2.2.2 Method

A free description questionnaire was conducted in a class in October 2013. The teacher, Mr. Fujimoto, conducted it. Both Mr. Fujimoto and children answered it. The questionnaire had spaces for writing class and name, and lines to write rules in class. It also had an instruction sentence in Japanese, “Please write as many classroom rules (when you listen to the teacher or friends, when you say something, when you discuss in a group, when you answer the questions of textbooks or papers, etc.) as possible.”

### 2.2.3 Results

The number of classroom rules that the teacher answered to the questionnaire was fourteen. The total number that children answered was three hundred and fifty-two rules ( $11.77 \pm 4.95$  rules). How the authors counted the answers was as follows; clauses which explained conditions (e.g. “when you listen to others,”) and behaviors (e.g. “I look at the person saying something,”) were counted as one set. If there were more than two behaviors per clause, each behavior was counted as one answer. The authors excluded fifty-two answers because they were not about class (e.g. I don’t have any fight with my friends.). The rest of answers were categorized by a bottom-up method. As Table 1 shows, there were five categories of classroom rules.

The first category of classroom rules was named as “Rules to think highly of other children” because the participants answered to the pre-exam such as “When I listen to others, I pay regard to what he/she are thinking” and “I look at the person saying something” (63rules: 20.1%). The second category was named as “Rules to make up persuasive idea” because the participants answered “When I say something in class, I give reasons” and “When I listen to other children, I compare their idea with mine” (26 rules: 8.3%). The third category was named as “Rules to maintain the order” because the

Table 1. Categories of classroom rules classified from the answers

Classroom rules	Definition	Number(%)
Rules to think highly of other children	Not to bother other children, or to recognize other children approvingly	63(20.1)
Rules to make up persuasive idea	To make up idea about tasks or other children’s idea and tell it more persuasively	26(8.3)
Rules to maintain the order	To control self-serving action such as backing up the procedure of classes	34(10.8)
Rules of formal behavior	Routine rules which don’t influence the procedure of classes and what children understand in learning	144(45.9)
Rules of individual works	Rules when each child works on tasks individually	47(15.0)

participants wrote rules such as “I move on the next task quickly” and “When the teacher tells us to stop working, I quit immediately” (34 rules: 10.8%). The

fourth category was named as “Rules of formal behavior” because the participants wrote, “I write my name on papers,” “I respond to the teacher when he calls my name,” and so on (144 rules: 45.9%). And the fifth category was named as “Rules of individual works” because the participants’ answers were such as “I write something to the last line on papers” and “When I work on papers, I skip some questions I can’t answer” (47 rules: 15.0%). Also, the last category was eliminated from the analysis because the authors didn’t have any opportunities to observe children taking exams.

### 2.3 Main Survey: Identification the Differences between the Teacher’s and Children’s Recognition to Classroom Rules

#### 2.3.1 Purpose

Based on the result of pre-exam, the purpose of the main survey was to clarify the difference between the teacher’s and children’s recognition to classroom rules, from the viewpoint of the priority of classroom rules (Analysis 1) and purposes and reasons of classroom rules (Analysis 2). On the one hand, the priority of classroom rules was measured with a questionnaire that the authors made out to identify on what kind of rules the participants put a high priority when they struggle with something in class. On the other hand, the purposes and reasons of classroom rules were measured with another questionnaire which authors made to ask the participants.

#### 2.3.2 Method

On the basis of the four kinds of classroom rules categories, a questionnaire which was named as “Questionnaire about Classroom Rules in Situation You Conflict” was conducted to identify the difference of the priority of classroom rules between the teacher and children (Table 2). The authors described six situations that two rules conflict on the questionnaire. The rules on the questionnaire were chosen for the reason that children might be often required to keep in class, based on the result of pre-exam. The participants firstly wrote their class and name, and answered how important each rule was for them and on which rules they put higher priority in the six situations. Also, the participants answered the reasons why they thought the rules important as free description. Five-point scale was used to measure the level of importance (1= not important at all, 2= not important so much, 3= neither, 4= important, 5= very important). To measure the priority of classroom rules, four-choice question (for example, in situation 1 of Table 2, 1= I copy what are written on the board very carefully, 2= I’d rather copy what are written on the board carefully, 3= I’d rather listen to another child, thinking what he/she wants to tell, 4= I listen to another child, thinking what he/she wants to tell. The teacher was asked to answer how important each rule was for him). The questionnaire was conducted by the authors during a class in November 2013. It took about twenty-five minutes. The answers of thirty out of thirty-two children and the teacher were used for analysis. Two children were excluded from the analysis because one boy was absent on that day and the other boy who was returnee didn’t

Table 2. Content of “Questionnaire about Classroom Rules in Situation You Conflict”

Conflict	Situation
Rules of formal behavior: I copy what are written on the board. Rules to think highly of other children: I listen to another child, thinking what he/she wants to tell.	1 In a class, you tried to copy all of the things written on the board carefully. Then another child started talking.
Rules of formal behavior: I copy what are written on the board. Rules to make up persuasive idea: I write what another child is saying.	2 In a class, after a child talked, the teacher wrote what we learned during the class, not what the child talked about.
Rules to think highly of other children: I say what was good of another child’s utterance. Rules to maintain the order: I listen to the teacher explaining.	3 In a math class, after a child explained how to answer to the question, you would try to say what was good of the child’s utterance. Then the teacher started to explain about the next question.
Rules to make up persuasive idea: I look for the reasons from the textbook. Rules to think highly of other children: I listen to another child, thinking what he/she wants to tell.	4 In a Japanese class, you had an idea and would look for the reason of your idea from the textbook. Then a child started talking.
Rules of formal behavior: I keep on copying what are written on the board carefully. Rules to maintain the order: I start to discuss in a group.	5 In a class, when you were writing what were written on the board, it got to the time to discuss in groups.
Rules to make up persuasive idea: I say the reasons of my idea to my neighbor child. Rules to maintain the order: I listen to the teacher.	6 In a class, when you were discussing with your neighbor child, there was little time left. You talked about what you thought and would say the reasons. Then it was time to finish and the teacher started talking.

Table 3. Contents of “Questionnaire about the Purposes and Understanding of Classroom Rules”

No.	Contents	Classroom rules
1	Not to disagree with others during their utterances right away	Rules to think highly of other children
2	To switch talking and listening quickly	Rules to maintain the order
3	To be willing to discuss in pairs or groups	Rules to maintain the order
4	To look for the reasons of idea from the textbooks, data and result of experimentation	Rules to make up persuasive idea
5	To stop working right away when the teacher says “Stop”	Rules to maintain the order
6	To sit up straight in class	Rules of formal behavior
7	To find out the good points of other children’s idea	Rules to think highly of other children
8	To listen to others, thinking what they want to tell	Rules to make up persuasive idea
9	To talk about idea with the reasons	Rules to make up persuasive idea
10	To write up things when taking notes so that it is easy to review	Rules of formal behavior
11	To take notes what is important in the teachers’ or other children’s utterances	Rules to think highly of other children
12	To respond when you are named to	Rules of formal behavior

understand Japanese so much.

Additionally, another questionnaire was conducted which was named as “Questionnaire about the Purposes and Understanding of Classroom Rules” to investigate the difference of the purposes and reasons of classroom rules between the teacher and children, based on the four categories classified from pre-exam (Table 3). The authors made this questionnaire and they picked out twelve items, three items from four categories each. The twelve items were chosen because it seemed that children were often required to keep the rules, based on the result of pre-exam. The participants wrote their class and names and answered why each item was in class. The questionnaire had an instruction sentence in Japanese, “You don’t have to answer to the questions that you don’t know.” It was conducted by the authors in a class in December 2013. It took about fifteen minutes. Two children were excluded from the analysis because a girl was absent on the day and a returnee boy didn’t understand Japanese very much.

### 2.3.3 Results

#### 2.3.3.1 Difference between the Teacher’s and Children’s Priority of Classroom Rules (Analysis 1

Based on the result of “Questionnaire about Classroom Rules in Situation You Conflict,” the number of children which agreed to the teacher’s priority of classroom rules was worked out. The method was, firstly, to identify on which classroom rules the teacher and children put higher priority in situations that the participants were supposed to conflict, the level of importance in the four-choice question was graded and summed up as one and two, and three and four scores. For example, in the situation 1 of Table 2, “Rules of formal behavior”

was assumed to be graded as one point and “Rules to think highly of other children” was assumed to be graded four point side. If some of the participants chose one or two from the four-choice, it was assumed that they put higher priority on “Rules of formal behavior.” In contrast, if some participants chose three or four from the choices, they would be the ones who thought “Rules to think highly of other children” more important than “Rules of formal behavior.” Secondly, children who agreed to the teacher which rules they thought more important were scored as one point. On the other hand, if children’s choices disagreed to the teacher’s, they were scored as zero point. The authors summed up the total score of each participant answered per situation and the score was assumed to be the number of children in agreement with the teacher (Table 4).

To compare the difference of ratio of agreement with disagreement, binomial test was conducted per situation. As a result, in Situation 2,5 and 6, the classroom rules that children and the teacher thought more important were concordant ( $p < .01$  in each situation). Meanwhile, Situation 3 and 4, the classroom rules were discrepant, which the difference between the teacher’s and children’s recognition in classroom rules was indicated ( $p < .05$  in each situation). In Situation 3 (“Rules to think highly of other children” vs “Rules of formal behavior”), the teacher thought “Rules to think highly of other children” more important, but children put higher priority on “Rules of formal behavior.” In Situation 4 (“Rules to make up persuasive idea” vs “Rules to think highly of other children”), the teacher chose “Rules to make up persuasive idea,” but children thought “Rules to think highly of other children” more important. In Situation 1, any difference was not indicated (*n.s.*).

Table 4. Number of Children in Agreement with the Teacher (N=30)

No.	Classroom Rules	Number of Children	Results
1	formal behavior	12	<i>n.s.</i>
	<b>think highly of other children</b>	18	
2	formal behavior	6	concordance**
	<b>make up persuasive idea</b>	24	
3	<b>think highly of other children</b>	9	discrepance*
	maintain the order	21	
4	<b>make up persuasive idea</b>	8	discrepance*
	think highly of other children	22	
5	formal behavior	5	concordance**
	<b>maintain the order</b>	25	
6	make up persuasive idea	7	concordance**
	<b>maintain the order</b>	23	

Classroom rules in boldface shows which the teacher chose  
\*\*:  $p < .01$ , \*:  $p < .05$

Table 5. Concordance rate of the teacher's and children's purpose and understanding of classroom rules (N=30)

Classroom rules	Concordance rate (%)	Results
think highly of other children	31.1	discrepance**
make up persuasive idea	48.9	<i>n.s.</i>
maintain the order	31.1	discrepance**
formal behavior	53.3	<i>n.s.</i>

Each concordance rate was calculated by dividing the number of "concordance children" into 90 (3items\*30children) \*\*:  $p < .01$

### 2.3.3.2 Difference between the Teacher's and Children's Purpose and Understanding of Classroom Rules (Analysis 2)

Based on the result of "Questionnaire about the Purposes and Understanding of Classroom Rules," the difference between the teacher's and children's purpose and understanding of classroom rules was investigated. The method was that two raters individually rated whether the teacher's and children's answers were concordant or not. Each rater scored one point when the answers of the teacher and children were in agreement per item. If no comment or disagreement, the score was zero. The raters calculated scores of each child and set up coefficient of correlation, which was  $r=.83$ . It can be said that the reliability of rating was indicated. If ratings of the raters were disagreement, they consulted and decided.

On the basis of the ratings, the number of differences between the teacher's and each child's purpose and understanding of classroom rules per item was calculated (no answer was included into the number of differences). The children's average of the number of differences was  $4.93 \pm 2.13$  (minimum=1; median=5; maximum=8; mode=7). Also, the children's average of the number of no answer was  $2.50 \pm 3.12$  (minimum=0; median=0.5; maximum=9; mode=0). There were fourteen children who had more than six differences, and there were also fourteen children who had at least one item of no answer.

In addition, based on the ratings after rater's consultation, the number of children who agreed to the teacher in the answers of purposes and understanding of classroom rules was calculated. And the concordance rate was computed by summing up the number of children who agreed to the teacher per item for each kind of classroom rules (Table 5). To compare the difference of the ratio of "concordant children" with "discrepant children," binomial test was conducted per classroom rule. As a result, it was indicated that there was a difference between the teacher's and children's purpose and understanding in two kinds of rules ( $p < 0.1$  in each rule). One was "Rules to think highly of other children (31.1%)" and the other was "Rules to maintain the order (31.1%)."

## 2.4 Discussion

From the result of pre-exam, it was clarified that the classroom rules of the participants could be classified into five kinds (Table 1). Until now, it has been assumed that classroom rules meant rules equivalent to "Rules to maintain the order," "Rules of formal behavior" and "Rules of individual works" in this study (Arima, 1999; 2000). It seems that this study indicated the diversity of classroom rules because "Rules to think highly of other children" and "Rules to make up persuasive idea" were found as well. It can be said that children in the class recognized some rules which were needed for social life. For this reason, it is possible to say that a wide range of classroom rules may be recognized not only in the class but also other classes.

Also, the result of main survey showed that there were differences of priority of classroom rules between the teacher and children in two situations which the participants were assumed to conflict (Table 4). Focusing on the rules that there were differences, firstly in Situation 3, the teacher thought "Rules to think highly of other children" more important. In contrast, children put higher priority on "Rules to maintain the order." This result may indicate that children had recognition to respect the teacher because children thought smooth procedure

in class more important. Children might recognize that they could get information and learn more from the teacher's explanation or instruction, and that it would be impolite to the teacher if the order was disturbed. Meanwhile, the teacher put more emphasis on communication among children than children's listening to the teacher. Therefore, the difference between the teacher's and children's recognition to classroom rules was found.

Moreover, in main survey, differences of purpose and understanding of classroom rules were found (Table 5). In the questionnaire which had twelve questions, the number of differences was seven at mode and it was indicated that there were a certain number, fourteen, of children who disagreed to the teacher in more than half items. And the result also showed that there were fourteen children who had at least no answer in the questionnaire. It is possible that a given number of children are keeping classroom rules and living their school life without purpose and understanding of classroom. It is suggested that any support for purpose and understanding of classroom rules which children didn't answer should be improved.

### **3 STUDY 2: INFLUENCES OF DIFFERENCES BETWEEN THE TEACHER'S AND CHILDREN'S RECOGNITION TO CLASSROOM LIFE**

#### **3.2 Question and Purpose**

In Chapter 2, classroom rules that the teacher and children recognized were identified. Furthermore, in was investigated that there were differences of classroom rules between the teacher's and children's recognition. This might be linked with a possibility of children's maladjustment to their school life. For example, if there was a difference of classroom rules between the teacher's and a child's recognition, the child might not rely on the teacher because of the difference. At the same time, there is a possibility that the feeling of adjustment to classroom and classroom climate could be negatively influenced by the differences. Therefore, in this chapter, the purpose was to investigate how differences between the teacher's and children's recognition to classroom rules influenced to classroom life.

Table 6. Content of the Questionnaire about recognition to classroom rules (N=30)

	Contents	Rating scores(SD)
	To find out the good points of other children's idea	4.26(0.94)
	To listen to others, thinking what they want to tell	4.35(0.73)
children	Not to disagree with others during their utterances right away	4.26(1.01)
	Not to say what bruise others	4.65(0.64)
	To pass papers to others with care	4.23(1.17)
make up	To talk about idea with the reasons	4.00(1.09)
persuasive	To compare my idea with others' when listening to others	3.77(1.14)
idea	To take notes what is important in the teachers' or other children's utterances when listening	4.23(1.02)
	To take notes others' idea when talking in groups	3.81(1.29)
	To look for the reasons of idea from the textbooks, data and result of experimentation	3.77(1.11)
maintain	To raise my hand when saying something	4.23(1.17)
the order	To be willing to discuss in pairs or groups	4.16(1.06)
	To switch talking and listening quickly	4.32(1.18)
	To say something when the teacher calls my name without hesitation	4.42(1.00)
	To stop working right away when the teacher says "Stop"	4.45(0.83)
formal	To write my name on every paper	4.45(1.12)
behavior	To write up things when taking notes so that it is easy to review	4.03(1.38)
	To sit up straight in class	4.10(1.23)
	To respond when you are named to	4.42(1.25)
	To stand up when saying something	4.32(1.18)
individual	To read sentences carefully when answering to questions	4.29(1.04)
works	To answer to questions by myself	4.23(1.10)
	To write sentences using full of lines on papers	3.84(1.38)
	To write letters carefully when working on papers	4.06(1.25)
	Not to talk with others when working on papers	4.16(1.30)

The questionnaire was conducted in Japanese. Some letters were modified by the authors so that children could read.

### 3.3 Method

#### 3.3.1 Questionnaire about Recognition to Classroom Rules

Based on the five categories of classroom rules from the result of pre-exam in Chapter 2, a questionnaire was conducted to rate the level of importance of the participants (Table 6). The authors made the questionnaire by picking twenty-five classroom rules, five items from each five category, which were supposed to keep frequently in class, based on the result of pre-exam in Chapter 2. The participants answered to each twenty-five question by five-point scale (1=not important, 2=not important so much, 3=neither, 4=rather important, 5=important). The answers were supposed to be influenced by social desirability because the questionnaire asked the importance of classroom rules. So the questionnaire didn't require class and name of the participants. Also, children were provided with envelopes each and they could hand in the answers in the envelope to the teacher without being checked by the teacher (they were required to write the student number). The authors conducted the questionnaire in a class in November 2013. It took about ten minutes. The same as Chapter 2, "Rules of individual works" was excluded because there was no opportunity of observing children worked individually such as taking exams and the consistent report was needed. Furthermore, two boys were excluded for analysis because one was absent and the other was a returnee who didn't understand Japanese well.

From the result of the questionnaire, ceiling effect was found in a lot of items (Table 6). This result could be considered reasonable because ceiling

effect might be influenced by mind of children and the teacher that classroom rules were important and should be kept.

#### 3.3.2 Questionnaire about School Life

To investigate how children were living their school life, three questionnaires about school life were conducted.

First, "Measurement of reliability on teachers (Nakai and Shoji, 2006)" was used. This questionnaire was consisted of forty items from three factors, to measure how children relied on teachers from the viewpoint of "relief", "distrust" and "legality." The authors were asked to choose items on the questionnaire by the participants, and thirteen items were chosen to measure. There were eight items about "relief," four items about "legality" and one item about "distrust." Since then, items about "distrust" were excluded because only one item was chosen. Also, the authors modified some expressions on questionnaire because the measurement was originally developed for junior high school students. The participants answered to the questionnaire with four-point scale (1= I don't agree at all, 2=I don't agree so much, 3=I partly agree, 4= I strongly agree).

Second, "Questionnaire about classroom climate shorten edition for elementary school children (Ito, 2009)" was used. This questionnaire was consisted of twenty-six items from six factors, "participation to classroom activities," "friction in classroom," "satisfaction with school," "natural self-closure," "intentionally for learning," and "manner for discipline." Also, one item for "manner for discipline" was added and the total number of items became twenty-seven (Ito and Matsui, 2001). The



way to answer was using five-point scale (1=I don't agree, 2=I don't agree very much, 3= neither, 4=I partly agree, 5= I agree).

Third, “Measurement of the feeling of adjustment to classroom for elementary school children (Emura and Okubo, 2012)” was used for the questionnaire. This questionnaire was on the basis of children's internal criteria, from the viewpoint of suitability of individual and environment. It was consisted of fifteen items from three factors, “feeling of comfort,” “feeling of trusted and accepted,” and “sense of fulfillment.” The authors didn't modify any part of the questionnaire. The participants answered with four-point scale (1=not true at all, 2=rather not true, 3=rather true, 4= true).

### 3.4 Result

#### 3.4.1 Result of “Questionnaire about Recognition to Classroom Rules” and “Questionnaire about School Life”

First, Table 7 shows the result of “Questionnaire about recognition to classroom rules,” which Pearson's coefficient of correlation and Cronbach's alpha coefficient between classroom rules categories, and, the average score of each classroom rules of children and the teacher. Second, Table 8 shows the result of “Questionnaire about school life” of Pearson's coefficient of correlation. In “Questionnaire about recognition to classroom

rules,” correlation between each classroom rule was high, from  $r=.63$  to  $r=.91$  ( $p < 0.1$  for all). Also, Cronbach's alpha coefficient was from .555 to .889. Only low alpha coefficient ( $\alpha=.555$ ) was found in “Rules to make up persuasive idea.” High correlation between classroom rules and low  $\alpha$  coefficient of “Rules to make up persuasive idea” should be further researched, with the view to distinctiveness of classroom rules category and validity in the categories. Although this matter had a limitation in practical study, the detail will be discussed in the next section.

#### 3.4.2 Influences of Differences between the Teacher's and Children's Recognition to Classroom Life

Firstly, from the answers of “Questionnaire about recognition to classroom rules,” differential score between the teacher and children was calculated (the teacher's score minus children's). Secondly total differential scores were viewed as scores of differences of the teacher's and children's recognition to classroom rules (Table 9). Differences in each item on the questionnaire were not analyzed because of high coefficient of correlation between classroom rules category and low  $\alpha$  coefficient. Instead, items were included in each category as a whole, and the scores of differences were used for

Table 7. Coefficient of correlation and coefficient, and scores of children and the teacher of “Questionnaire about recognition to classroom rules” (children:  $N=30$ )

Classroom rules	I	II	III	coefficient	children's average score	teacher's score
I. think highly of other children				.844	22.1(3.27)	24
II. make up persuasive idea	.70 *			.555	20.0(3.16)	19
III. maintain the order	.65 *	.65 *		.753	21.8(3.59)	20
IV. formal behavior	.63 *	.66 *	.91 *	.889	21.6(5.07)	20

\*\*: $p < .01$ , \*: $p < .05$

Table 8. Coefficient of correlation of “Questionnaire about school life” ( $N=30$ )

trust for the teacher		classroom climate								feeling adjustment classroom	
	I	II	III	IV	V	VI	VII	VIII	IX	X	
I											
II	.53 **										
III	.56 **	.34 +									
IV	.22	-.17	-.26								
V	.55 **	.32 +	.44 *	-.18							
VI	.62 **	.38 *	.65 **	-.22	.42 *						
VII	.58 **	.29	.69 **	-.24	.53 *	.66 **					
VIII	.76 **	.33 +	.80 **	-.22	.46 *	.65 **	.68 **				
IX	.32 +	.17	.15	-.46 *	.53 **	.43 *	.21	.26			
X	.47 **	.17	.41 *	-.33	.41 *	.50 **	.38 *	.36 +	.50 **		
XI	.46 *	.32 +	.56 **	-.05	.62 **	.60 **	.49 **	.60 **	.53 **	.67 **	

I: relief, II: legality, III: participation to classroom activities, IV: friction in classroom, V: satisfaction with school, VI: natural self-closure, VII: intentionally for learning, VIII: manner for discipline, IX: feeling of confort, X: feeling of trusted and accepted, XI: sense of fulfilment

\*\*: $p < .01$ , \*: $p < .05$ , +: $p < .10$

Table 9. Simple and partial coefficient correlation between categories of classroom rules and trust for the teacher

	think highly of other children	make up persuasive idea	maintain the order	formal behavior
<u>simple coefficient correlation</u>				
relief	.51 **	.40 *	.22	.26
legality	.52 **	.40 *	.09	.14
<u>partial coefficient correlation</u>				
relief	.40 *	.13	-.20	.09
legality	.51 **	.21	-.30	.05

\*\*: $p < .01$ , \*: $p < .05$

Table 10. Simple and partial coefficient correlation between categories of classroom rules and classroom climate

	think highly of other children	make up persuasive idea	maintain the order	formal behavior
<u>simple coefficient correlation</u>				
participation to classroom activities	.55	.50 **	.37 *	.15
friction in classroom	-.27	-.20	-.10	-.03
satisfaction with school	.24	.39 *	.32 +	.25
natural self-closure	.22	.39 *	.15	.08
intentionally for learning	.36	.41 *	.41 *	.28
manner for discipline	.47	.34 +	.29	.15
<u>partial coefficient correlation</u>				
participation to classroom activities	.42	.38 *	.57 **	-.66
friction in classroom	-.22	-.09	-.09	.19
satisfaction with school	-.10	.30	.21	-.17
natural self-closure	-.03	.40 *	.14	-.25
intentionally for learning	.08	.20	.34 +	-.30
manner for discipline	.36	.10	.30	-.36

\*\*: $p < .01$ , \*: $p < .05$ , +: $p < .10$

Table 11. Simple and partial coefficient correlation between categories of classroom rules and children's feeling of adjustment to classroom

	think highly of other children	make up persuasive idea	maintain the order	formal behavior
<u>simple coefficient correlation</u>				
feeling of confort	.13	.30	.20	.25
feeling of trusted and accepted	.50 **	.67 **	.52 **	.58 **
sense of fulfilment	.29	.43 *	.29	.24
<u>partial coefficient correlation</u>				
feeling of confort	-.13	.24	-.07	.12
feeling of trusted and accepted	-.01	.43 *	-.10	.22
sense of fulfilment	-.03	.32	.12	-.13

\*\*: $p < .01$ , \*: $p < .05$

analysis. Also, positive score shows that the teacher recognized the rules more than children and negative score shows that children recognized the rules more than the teacher.

Simple linear regression analysis was conducted which independent variable was the score of differences of classroom rules and dependent variable was the result of “Questionnaire about school life.” As a result, first, about “trust for the teacher,” differences of recognition to classroom rules negatively influenced “relief” ( $b^* = -.42$ ,  $R^2 = .18$ ) and “legality” ( $b^* = -.39$ ,  $R^2 = .15$ , see Figure 1). Second, in respect of “classroom climate,” differences of recognition negatively influenced “participation to classroom activities” ( $b^* = -.48$ ,  $R^2 = .23$ ), “intentionally for learning” ( $b^* = -.41$ ,  $R^2 = .17$ ), and “manner for discipline” ( $b^* = -.40$ ,  $R^2 = .16$ , see Figure 2). Third, in respect of “feeling of adjustment to classroom,” differences negatively

influenced “feeling trusted and accepted” ( $b^* = -.59$ ,  $R^2 = .35$ , see Figure 3).

### 3.5 Discussion

In this chapter, the purpose was to investigate how differences of recognition to classroom rules between the teacher and children influenced classroom life. As a result of simple linear regression analysis, the more positive differences there were, the more negative influence to classroom life was found. Positive score of differences of recognition indicated that the teacher recognized classroom rules important more than children. In contrast, negative score of differences meant that children recognized the rules more than the teacher. We may say that children who recognize classroom rules important more than the teacher don't need to be advised to keep rules

because they are likely to adhere strictly to rules. On the other hand, children who recognized rules important less than the teacher might be instructed to keep rules. At the same time, there is a possibility that children who differently recognize classroom rules from the teacher have negative feelings such as “I’m dissatisfied” and “what the teacher says is unreasonable.” Thus it seems that differences which children recognize less than the teacher negatively influence classroom life.

First, in respect of “trust for the teacher,” the result showed that differences which children recognized less than the teacher negatively influenced “relief” and “legality” (Figure 1). This result shows a possibility that the less children recognized classroom rules important than the teacher, the less trust in the teacher children have. As mentioned in the hypotheses, it is possible that children might have distrust or anxious for the teacher and might not feel legality of the teacher because of having different recognition from the teacher. In previous literature, it was found that distrust for teacher negatively influenced high school students’ feeling of adjustment to classroom (Nakamoto, Mori, & Yara, 2008). Therefore, it can be said that differences which children recognize less than the teacher should be resolved.

Second, in respect of “classroom climate,” the result showed that differences which children recognized less than the teacher negatively influenced “participation to classroom activities,” “intentionally for learning,” and “manner for discipline” (Figure 2). “Questionnaire about classroom climate” is based on the Moos’ (1976) concept of “relationship,” “individual development and intentionally for target,” and “maintenance and change of organization,” which can investigate the nature of environment. In the result of this study, three correspondences were found, “participation to classroom activities” to “relationship,” “intentionally for learning” to “individual development and intentionally for target,” and “manner for discipline” to “maintenance and change of organization.” For this reason, the result may indicate that the less children had recognition to classroom rules than the teacher, the more three concepts Moos (1976) pointed out were negatively influenced. To cultivate better classroom climate, we can say that differences of recognition to classroom rules should be removed.

Third, in respect of “feeling of adjustment to school,” the result showed that differences which children recognized less than the teacher negatively influenced “feeling of trusted and accepted” (Figure 3). It indicates that the less children had recognition to classroom rules, the more children’s “feeling of trusted and accepted” would turn down. As mentioned in the hypotheses, it is possible that children who are frequently instructed to keep rules

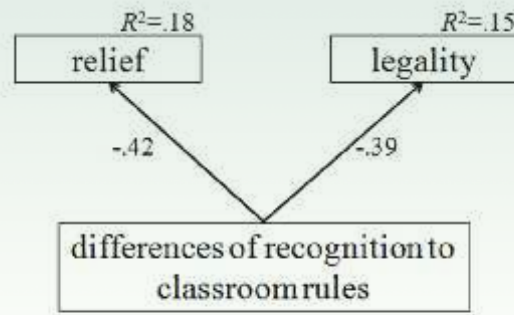


Figure 1. Influence of differences of recognition to classroom rules between the teacher and children to trust for the teacher (N=30)

by the teacher tend to be recognized as “children who are often advised.” Okubo (2005) found that “feeling

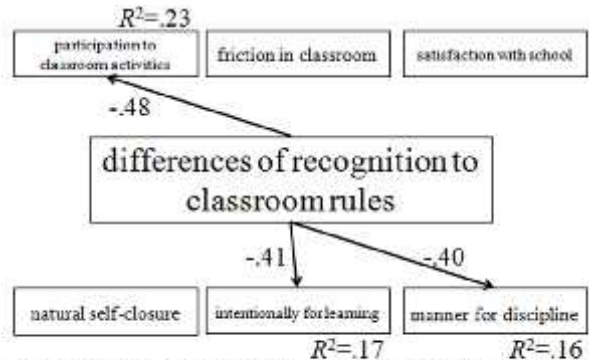


Figure 2. Influence of differences of recognition to classroom rules between the teacher and children to classroom climate (N=30)

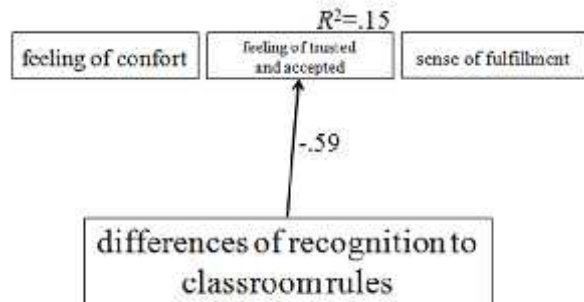


Figure 3. Influence of differences of recognition to classroom rules between the teacher and children to children’s feeling of adjustment to classroom (N=30)

of trusted and accepted” had positive relation with high school students’ feeling of blessed with school and of adjustment to school. At the same time, it was found that “feeling of trusted and accepted” negative relation with depression. Considering these positive or negative factors, differences of recognition should be resolved.

## **4 STUDY 3: PROCESS AND SITUATION THAT DIFFERENCES OF RECOGNITION TO CLASSROOM RULES WERE REMOVED**

### **4.2 Purpose**

The purpose of this chapter was to clarify the process how differences of recognition to classroom rules between the teacher and children could be resolved, and in what situation differences could be removed.

In this chapter, practical situations were focused, which the teacher gave advice to some of children who didn't keep classroom rules, and afterward the teacher and the children negotiated about the rules. There were two reasons why those situations were focused. One was that it was assumed that the teacher would advise children if there were differences of recognition to classroom rules between the teacher and children. If there were some differences of recognition between the teacher and a child, the teacher might tell the child to adhere to classroom rules. To analyze the process how differences could be removed, it is necessary to observe situations where differences were occurred between the teacher and children in class. Considering the purpose of this study, it is important that we focus on situation which the teacher gives children to keep classroom rules.

The other reason was that there could be a possibility of resolving differences by interaction, in other words, negotiation for classroom rules between the teacher and children. Classroom rules should be kept to make procedure of classes go on smoothly. If there were differences of recognition to classroom rules between the teacher and children, interaction would not proceed smoothly. In such a case, researchers have found that differences could be removed by teacher's advice to children who had different recognition to classroom rules from the teacher. However, if the class was democratic, differences could be resolved through negotiation between the teacher and children, and through shared recognition to classroom rules. To clarify the process, negotiation for classroom rules should be focused and how differences were resolved should be analyzed. Therefore, it is necessary that we focus on situations where negotiation for classroom rules between the teacher and children, after the teacher advises children who didn't keep rules.

## **4.3 Method**

### **4.3.1 Analysis Object**

Analysis objects were data of voice recording for thirteen hours, which the teacher, Mr. Fujimoto had all classes at his fifth graders' class.

Observing all recordings, two cases were extracted that the teacher and some children negotiated for classroom rules after a child were given advices by the teacher. In each case, it was inferred that that the rules which children were expected to adhere were different from the teacher wanted them to. So the authors searched situations from the data, that the teacher advised some children about the rules that he expected them to keep, or that there were negotiations for the rules between the teacher and children. Then three more cases were found. In this chapter, these five cases were analysis objects.

### **4.3.2 Procedure**

First, what kind of rules the teacher expected children to adhere, about what kind of rules the teacher gave children advices, and what kind of rules children kept or not were analyzed from the participants' utterances in the data. Second, the rules both the teacher and children recognized were compared to show differences of recognition to classroom rules between them. Third, each result of analyses was compared and reviewed for analyzing the process how differences could be removed and the situations.

## **4.4 Results and Discussion**

Two cases that the teacher gave some children advices about classroom rules and they negotiated for the rules were observed in the data. One was a situation of negotiation for a rule that children didn't say anything unconcerned with the class. The other was a situation which the teacher explained children about a rule that children who were called on had to say something. In five cases to analysis extracted from the data, two cases were related to the former situation mentioned above, and the other three cases were relevant to the latter. They were analyzed to investigate how and in what situations that differences of recognition to classroom rules between the teacher and children were removed.

#### 4.4.1 Situations that the Teacher Advises Children not to say something Unconcerned with the Lesson

In this section, situations which the teacher and children negotiated for a rule that children didn't say anything unconcerned with the class were analyzed.

##### 4.4.1.1 Case 1 Situation that the Teacher tells a Child not to say something Unconcerned with the Lesson and Negotiated with the Child for the Rule

As mentioned above, two cases were extracted from the data, which interaction between the teacher and children were found. Table 12 shows one case of the two. It was a P.E. class on November 22<sup>nd</sup>. Children were learning how to play flag football in their classroom. The teacher explained the rules and asked children whether they had questions or not, when sixteen minutes passed from the class bell. Children asked the teacher some questions about possible situations during the game and he answered to each question. Case 1 in Table 12 shows a situation which includes utterances of the teacher, Nishina and some other children, when forty-three minutes passed from the bell. Case 1 starts with an utterance that the teacher called on Nishina, who were raising his hand to say something.

Nishina, who negotiated with the teacher in Case 1, answered to “Questionnaire about classroom rules” (pre-exam in Chapter 2) that there were classroom rules such as not to disagree with others right away and not to say something during others' talk. From his answer, it can be said that he recognized such rules were in the classroom. Also, to “Questionnaire about recognition to classroom rules” (a part of analysis 2 in Chapter 3) he answered 4.88 average score in twenty-five items while others' average score was 4.18. So he might recognize the importance of classroom rules more than others.

In Case 1, the rule that the teacher expected children to keep and the rule that children would keep were analyzed below. Numbers of utterances are corresponding to numbers in the left line of Table 12.

In 101, the teacher called on Nishina who would ask a question. Nishina stood up and would ask a question in 102. However, Nishina didn't respond “Yes” to the teacher in 102, and the teacher called on him again in 103. As a result, Nishina said to the teacher, “Yes” and would ask a question again. This interaction seems that the teacher might expect Nishina to keep the rule of responding after being called on, and Nishina didn't keep the rule. In 103, the teacher had Nishina adhere to the rule without

mentioning it. In other words, it was the teacher's advice that he called on Nishina again. And Nishina replied, “Yes” in 104.

In 104, Nishina prefaced “Zettaiarienaindesukedo (It will never happen in the game, but),” before questioning. The teacher repressed Nishina's utterance, saying “iwanaide ii (then you don't have to say that)” in 105. Soon after the teacher's utterance, Dobashi (106) and another child (107, it was unclear who uttered) said, “Iunayo (Don't say)” as the teacher said to Nishina. It seems that these utterances indicated the rule of “not saying something unconcerned with the class.”

In 108, the teacher said to Nishina why he stopped Nishina's utterance. He explained that there was no need to say something wrong as a question, saying “Ari enaitteiundattara (If you say that it would not happen).” Utterance 108 may indicate that the teacher expected Nishina to adhere to the rule of “not saying something unconcerned with the class.”

To the teacher's utterance in 108, Nishina said, “Akai (Red)” in 109. He seemed that he started asking a question in disregard of repression from others because Nishina uttered “akai MP ga” as a part of his question in 117. In 109, Nishina might adhere to the rule of “talking about one's idea to the end.” In pre-exam of Chapter 2, Nishina answered to the questionnaire that there was a rule of “talking without interruption.” Also, he wrote to the questionnaire about a rule of “listening through to the end” and “not to interrupt other's talk.” Thus he seemed to adhere to the rule of “talking about one's idea to the end” in 109.

In 110, the teacher said, “Ne, kiiteru (Hey, don't you listen to me)?” This utterance meant the teacher made sure that Nishina understood that the teacher repressed Nishina's utterance in 108. It might be because Nishina started asking a question in 109, neglecting the teacher's repression.

After 110, Nishina stopped to utter for a while in 111. The teacher also did so for four seconds and explained the reason why he expected Nishina to keep the rule of “not to say something unconcerned with the class.” The reason was that the teacher didn't want to waste time. The teacher seemed to point out that it was time-wasting that Nishina would ask a question as “It will never happen.” On the other hand, the teacher required children to ask if they had questions (112). He asked whether Nishina would utter or not, saying “Docchi (Which)?”

It seemed that the teacher explained Nishina about keeping a rule of “not to say something unconcerned with the class.” On this rule, the preface was repressed, different from 105 and 108, which stopped whole utterances. It might be because the teacher made Nishina choose between stopping to utter without remediation the preface, and asking a question with

switch the preface. In 114, the teacher asked Nishina, “Docchi (Which)?” again. The teacher seemed to make Nishina adhere to the rule of “not to say something prefaced that it would be unconcerned with the class,” expecting the same choice as 112.

In 115, Nishina switched his preface of 114, saying “Shitsumonshitaidesu (I want to ask).” He turned to adhere to the rule of “not to say something prefaced that it would be unconcerned with the class” from “talking without interruption.”

Because Nishina switched his preface, the teacher urged Nishina to ask a question in 116. Nishina started to ask a question, “Akai emupiga (Red MP runs).” Then the negotiation between the teacher and Nishina for classroom rules ended up.

In other words, there could be a difference of recognition which rule to keep between the teacher and Nishina.

However, Nishina uttered, following a “new” rule in 115 because the teacher switched the rule. In 109, Nishina turned away from the rule that the teacher expected Nishina to adhere to in 105 and 108. This difference might be resolved by neglecting Nishina and calling on other children. But it seemed that the teacher recognized Nishina’s statement and negotiated with him for switching the rule to “not to say something prefaced that it would be unconcerned with the class.” As a result, the rule which both the teacher and Nishina expected to follow came to correspond and the difference seemed to be removed.

Table 10. The contents of the teacher’s and students’ utterances and the classroom rules they expected each other to follow

	Speaker	Utterance contents	In Japanese	Classroom rules
101	Teacher	Mr. Nishina (43min. 10sec.)	NishinaSan.	to respond
102	Nishina	Well	Ano	when being called on
103	Teacher	Mr. Nihina	Nishina san	
104	Nishina	Yes. It will never happen in the game, but	Hai. Zettaiarienaindesukedo.	not to say something unconcerned with the class
105	Teacher	Oh, then you don’t have to say that.	Jah, iwanaide ii.	
106	Dobashi	Don’t say.	Iunayo.	
107	Student	Don’t say.	Iunayo.	
108	Teacher	If you say that it would not happen, you may not say that.	Ari enaitteiundattara, iwanaideiyo.	
109	Nishina	Red	Akai	to talk about one’s idea to the end
110	Teacher	Hey, don’ you listen to me?	Ne, kiiteru?	
111		(4 sec.)		
112	Teacher	If the situation will not happen in the game, please do not ask. I don’t want to waste time for such a thing. If you just want to ask a question, do ask a question. Which is your will?	Ari enaindattara, kicanaidekudasai. Sonna jikanmudanitsukaitakunaidesu. jibungajunsuinisitsumonshitaaindattara, sitsumonshinasai. Docchi?	not to say something unconcerned with the class
113		(2 sec.)		
114	Teacher	Which?	Docchi?	
115	Nishina	I want to ask	Shitsumonshitaidesu.	
116	Teacher	Then, ask your question.	Jah, shitsumonshinasai.	
117	Nishina	Well, Red MP runs	Eeto, akaiemupiga	

As a summary of above, the rule that the teacher had expected children to adhere to was “not to say something unconcerned with the class,” based on his utterances 105 and 108. However, it seems to switch to “not to say something prefaced that it would be unconcerned with the class.”

In contrast, the rule that Nishina would have kept was “to talk about one’s idea to the end”, based on his utterance 109. At that point, the rule that the teacher expected children to keep and the rule that Nishina would adhere to might be different. The negotiation was going for different rules each other.

That can also be indicated from that the teacher and Nishina interacted smoothly after 117.

**4.4.1.2 Case 2 Situation that the Teacher gives Children Advices about a Rule not to say something Unconcerned with the Lesson**

Case 2 in Table 11 shows a situation where the teacher and children were discussing in a Japanese class on November 1<sup>st</sup>. They were talking about why an old man called a wild goose “Gan”, not “Zansetsu”, which was named by the man. The

situation in Table 11 starts with that the teacher called on a child, Ito.

Looking at Ito’s answer to the questionnaire about recognition to classroom rules (a part of Analysis 3 in Chapter 3), he got 3.0 average points while others got 4.19. So it can be said that he recognized the importance of classroom rules less than others. Also, his answer to the another questionnaire about the purpose and understanding of classroom rules (Analysis 2 in Chapter 2) had higher percentage of no answer (66%) than others (18.4%).

In Table 11, the rule that Ito would have follow was to preface that he would talk about something wrong in 202.

In contrast, the teacher told Ito not to say that in 203. This teacher’s utterance can be analyzed in two ways because he didn’t mention “Sore (That kind of thing).” One seems that the teacher stopped Ito to preface. The other seems that the teacher repressed Ito’s whole utterance. It would be appropriate that the former, which the teacher stopped Ito’s preface in 203 because soon after that, in 205, the teacher asked another child to talk about what Ito said. However,

Table 11. The contents of the teacher’s and students’ utterances in Case 2

Speaker	Utterance contents	In Japanese
201	Mr. Ito stand up. (from 22min. 35sec.)	
202	Ito Maybe, this isn’t right, I think	Tabun, chigau to omoundesukedo.
203	Teacher That kind of thing, you should not say now.	Sore wa, imaiwanaide ii.
204	Ito “He called the wild goose” means the other wild geese were there, doesn’t it? (The singular form and the plural form of “goose/geese” in Japanese are expressed by single word “Gan”.)	Ganniyobikaketa tteiuowa, hokanimo ganga itattekotonanjanaides houka.
205	Teacher OK. Ms. Kubo, please tell us your opinion concerning this opinion.	Hai, Kubo san, ima no ikennitaisite, anata no ikenwoittekudasai.

there is a possibility that Ito stopped talking in 203 because it also seemed that Ito’s whole utterance was repressed by the teacher.

As a result, Ito continued to talk about the reason why the wild goose was called “Gan” in 204. He didn’t say anything about the teacher’s repression. So it seems that Ito neglected the teacher’s utterance.

#### 4.4.1.3 Discussion 1: Process and Situation that Differences of Recognition to the Classroom Rule of “not to say something Unconcerned with the Class” were removed

In Case 1, it seems that the teacher succeeded in interacting with Nishina smoothly because the teacher switched the rule to another one applied at that time, taking Nishina’s utterance into consideration. Eventually Nishina seemed to adhere to the rule of “to talk about one’s idea to the end,” which he had followed at first but turned away for a while, by the teacher’s utterance in 117. In other words, we can say that the difference between the rule that children would follow (RC) and the rule that the teacher expected children to adhere to (RT) could be found. One more important thing is that it was found that how interaction between the teacher and a child changed and how the difference of recognition was removed by negotiation. Through the negotiation, the rule that the child had been required to adhere to was changed. Furthermore, the difference of recognition between the teacher and the child could be resolved and the interaction went on smoothly after all.

Compared with Case 1, Case 2 seems to have a feature that the teacher’s utterance was a little ambiguous. In Case 1, any negotiation for a classroom rule between the teacher and Ito could not be found and no rule was indicated clearly by the teacher. It is possible that the teacher could not stop Ito’s utterance because he speaks faster than others, and that the teacher could not instruct Ito to adhere to the classroom rule.

Comparing Case 1 to 2, it can be said that the teacher noticed that the child would follow a rule, which was different from the rule the teacher had expected. Then the teacher would negotiate with the child for changing a part of the rule. As a result of the negotiation, the difference of recognition could be removed.

In each case, indication of classroom rules may be necessary. As mentioned in exordium, usually classroom rules are not indicated. In Case 1, the rule that Nishina would follow was generally recognized in the classroom. On the other hand, the rule that the teacher expected Nishina to follow was in hiding in the classroom, and was not written by the participants in the questionnaire. So we can say that the negotiation between the teacher and Nishina made the implicit rule explicit. Through the negotiation, it will be necessary that the teacher and children make the rule that one expects the other to adhere to explicit.



**4.4.2 Situations that the Teacher gives Children Advices about a Rule of “saying something when being called on”**

Table 12. The contents of the teacher’s and students’ utterances in Case 2

Speaker	Utterance contents	In Japanese
30 Teacher	Why do you think the other wild geese were there?	Doushitehokaniiru to omotta?
30		(32sec. silence)
30 Teacher	I’m having a trouble with your silence. A little, your teacher is.	Damarareru to komarun (da). Chottosensei (wa).
30	(26sec. silence)	
30 Teacher	If you say “wait”, we will wait. If you say “Return my turn to comment after the other person’s turn”, it’ll be returned. If you do not understand (why), say “I don’t know.” If you want to hold on (thinking), say so. Anyway say something.	Matteiwaretaramatsushi, hoka no hitonittekaramatamodottekitteteiebamodori wakannainarawakannai, ganbarunaraganbar Toriaezu, nanika, nanikashiraittekure.
30		(12sec. silence)
30 Teacher	Don’t you understand?	Wakaranai?
30 Kubo	(She nodded.)	
30 Teacher	Mr. Sakai.	Sakai kun.

Table 13. The contents of the teacher’s and students’ utterances in Case 4

Speaker	Utterance contents	In Japanese
401 Okamoto	What? What would I say?	Nan dakke? Nanteiou to shitandakke?
402	((Okamoto and students laugh))	
403 Okamoto	I cannot remember.	Wasureteshimaima: hita.
404 Teacher	Well, please say again after the other students’ turns.	Mata jah, modottaraittechoudai.
405	((Okamoto was called again after the other students had been called their name.))	

Table 14. The contents of the teacher’s and students’ utterances in Case 5

Speaker	Utterance contents	In Japanese
402 Teacher	...	...

In this section, situations that the teacher gives advices to children about a rule that they should say something when they are called on by the teacher, including interaction between them were analyzed. It was also analyzed what kind of classroom rules the teacher and children had expected to follow. Moreover, compared with the results of previous section, the process and situations to remove differences of recognition to classroom rules between the teacher and children were discussed.

**4.4.2.1 Case 3 Situation that the Teacher tells a Child to say something when being called on and Negotiated with the Child for the Rule.**

Table 12 shows a situation that the teacher gave a child who turned away from a rule an advice, and they negotiated for the rule. Following Case 2, this Case 3 includes interaction between the teacher and the child when discussing what children thought about the contents of textbook.

Kubo was called on by the teacher although she had not been raising his hand. She kept silence for a while, bending down her head. After class, the authors interviewed with the teacher and asked him why he called on Kubo. The teacher answered that he did so because Kubo doesn’t usually say something in class and the teacher expected Kubo to talk about her idea. According to what the teacher said in the interview, he noticed that Kubo were talking with Takano who was next to Kubo, and he expected Kubo to talk about what she was talking.

In 301 of Case 3, the teacher asked Kubo a question again to encourage her to say something because the teacher already called on Kubo once, but she didn’t say anything.

The teacher waited for Kubo talking for thirty-two seconds (302) and said to her, “Damarareru to komaru (I’m having a trouble with your silence).” The teacher seems to have expected children to follow the rule of “saying something when being called on.” It also seems that the teacher explained to Kubo that the interaction was not going on smoothly because she didn’t follow the rule.

Kubo didn’t say anything even after that for twenty-six seconds (304) and was still turning away from the rule. Then the teacher explained her about the rule “saying something when being called on,” giving examples of “something” such as “wait,” “return,” “I don’t know” and “hold on.”

However, Kubo kept silence for a while (306). So the teacher asked her, “Don’t you understand?” and she nodded her head. This seems that Kubo followed the rule of “saying something when being called on.” After that the teacher could call on another child who had raised his or her hand before

Kubo was called, and he could keep on going interaction with children.

#### 4.4.2.2 Case 4 and 5 Situation that the Teacher gives Children Advices about a Rule of “saying something when being called on”

Table 13 shows a situation in a Japanese class on November 1<sup>st</sup> (the same as the class in Case 2 and 3). Thirty-five minutes passed from the class bell. The teacher called on Okamoto raising his hand. Then he stood up to talk.

Okamoto said that he forgot what to talk in 401. Following this, laughter of some children including Okamoto occurred.

In 403, Okamoto said, “Wasureteshimaimashita (I cannot remember).” He seems to have understood the rule of “saying something when being called on.”

Then the teacher held a chance of Okamoto’s talk and told that he would call on Okamoto again in 404. Indeed, four minutes later in Case 4, Okamoto was called on by the teacher and he talked in 405.

In Case 4, the interaction between the teacher and a child seems to go on smoothly. It can be said that there were no difference of recognition to classroom rules between them.

Table 14 shows that a situation in a science class on November 29<sup>th</sup>. Children were learning how to experiment of solving materials in the water. A few minutes later from the bell, the teacher asked a question to children and Izumi raised his hand. After being called on, Izumi stood up to talk.

The same as Okamoto in Case 4, Izumi forgot what he would say and could not answer (501).

Then the teacher asked Izumi to say that he didn’t know if he really didn’t know in 502. The teacher seems to require Izumi to adhere to the rule “saying something when being called on.”

It is possible that the teacher gave him an example of “something” as “I don’t know.” That might encourage Izumi to follow the rule.

However, Izumi got the teacher’s utterance wrong and said, “Ganbarimasu (I will hold on)” in 403. After that, the teacher and Izumi confirm the utterance of 403 in 404 and 405. In any case, there might be the rule of “saying something when being called on” explicitly, and the teacher seemed to hold Izumi’s say because another child was called on after 406. The interaction between the teacher and Izumi seemed to go on smoothly.

#### 4.4.2.3 Discussion: Process and Situation that Differences of recognition to the Classroom Rule of “saying something when being called on” were removed

Comparing the results of Case 3, 4 and 5, it seems that the interaction could go on smoothly after the difference of recognition between the teacher and a child was removed in Case 5. The process to resolve was that firstly a child’s behavior, which turned away from the rule the teacher expected children to follow, could be seen. Secondly the teacher and the child negotiated for the rule. Thirdly the teacher made the implicit rule explicit, and the interaction could progress smoothly.

Based on that, the situation that differences of recognition between the teacher and children may be that the rule is not followed, in other words, a child turns away from the rule. Children in Case 4 and 5 seemed to understand and adhere to the rule. So any negotiation for the rule could not be seen. If negotiation between a teacher and children can be linked to make the rule clear or explanation of the rule, children’s turning away from the rule should be a situation.

It may be necessary to make implicit rules explicit consciously while a teacher and a child negotiated for the rule. When the authors interviewed with the teacher after the observation on November 1<sup>st</sup>, he said that he always give advices to children about saying “something,” such as “I don’t know,” “wait,” “call on me later,” and so on. However, during the observation, any detail of “something” could not be seen, except for Case 3. Therefore, actually the rule might not be indicated explicitly although the teacher said he made the rule clear. This seemed to be linked to the difference of recognition. If differences of recognition to classroom rules between a teacher and children can be removed by indication of the rules, it is important that teachers are aware of making implicit rules in class explicit.

#### 4.5 Summary: Process and Situation that Differences of Recognition to the Classroom Rule can be removed

In this chapter, how differences of recognition to classroom rules between the teacher and children could be resolved was analyzed, focusing on two kinds of rules. One was that children should not say something unconcerned with the class. The other was that children should say something when they were called on by the teacher. Also, situations that differences of recognition were removed by negotiation between the teacher and children for the

rules were analyzed and discussed. As a result, several factors were found in negotiation: indication and explanation of the rule, indication of the rule that both the teacher and children expect to follow, and setting a new rule that both the teacher and children can adhere to.

Making inquiries about the result of Analysis 2 in Chapter 2, it is very important that teacher explains children about the classroom rules. In Case 3, the teacher explained about the rule and told he was confused when the child didn't follow the rule. The reason may be that what he did can be linked to recognition to the purpose of the rule in the result of Analysis 2. It is necessary that teacher behaves as mentioned above without hesitation because there seems to be more or less differences of recognition to the purpose of classroom rules.

Moreover, compared with the result of Analysis 1 in Chapter 2, we can say that it is also important that teacher actively negotiate with a child who turns away from a rule, and that they make the rule which both expect to follow explicit. In Case 1, a difference of recognition occurred because the teacher and the child differently expected to follow. It seems that the rules the teacher and the child put higher priority on were different in the situation that there were several rules that they had to follow. Based on the result of Analysis 1, it has been clarified that situations as above can be seen frequently. According to Ryan and Deci (2000), it can decrease children's autonomy and lower their motivation for learning that they are in the classroom without understanding what to do in class. Therefore, it is important that both teacher and children make it clear which classroom rule they expect to follow.

As situations to remove differences of recognition, we can point out that a child turns away from the rule the teacher expects him/her to follow, and that the teacher and the child negotiate for the rule. In Case 2, 4 and 5, children who negotiated with the teacher had in common: they often communicated with the teacher and other children. On the other hand, in Case 1 and 3, the children didn't frequently communicate with the teacher. Nishina in Case 1 talked about his idea, but in some cases he didn't say anything at all. Kubo in Case 3 said something only in the situation that the teacher called on her during the observation. It might be difficult for teacher to share classroom rules with children who are unlikely to interact with teacher in class. Therefore, to negotiate with those children for classroom rules is important for teacher.

Furthermore, because of time limitation in class, it is difficult that teacher has longer time to negotiate with children. However, as mentioned in Chapter 3, difference of recognition to classroom rules can negatively influence children's adjustment to school or with teacher. It is possible that negative influence

lasts in longer period if differences were left. Considering how influent differences are, it is necessary that teacher puts higher priority on negotiation with children for classroom rules.

## 5 5 CONCLUSIONS

In this study, features of a teacher's and children's recognition to classroom rules were investigated with the questionnaires and observation. Also, the process how differences of recognition to implicit rules in class between a teacher and children were removed was analyzed. As a result, several findings were as follows:

First, it was found that there were several kinds of classroom rules in participants' class such as rule to think highly of other children and rule to make up persuasive idea, not only that make procedure of classes go on smoothly. Also, children basically recognized that classroom rules are important, but there were differences of recognition to purposes and understanding of classroom rules in ordering their priority. Thus we can say that there are various kinds of differences of recognition in addition to classroom rules. As previous literature found, it is possible that there are many kinds of classroom rules in other classrooms, and that teacher and children adhere to some rules at the same time in class (Yamada, 1999). Therefore, the situation there are a variety of classroom rules and differences of recognition can occur in every classroom.

Based on these results, we can point out that there could be more factors of differences of recognition than children's weakened normative consciousness (Fuchikami, 2009). There is a possibility that children who strictly adhere to a rule would be given advices by teacher if they have different priority of rules or different purposes of rules from the teacher.

Second, it was indicated that differences of recognition could negatively influence children's school life and classroom climate. Although previous studies haven't investigated influence of differences to children yet, we may say that this study could show that differences of recognition were problematic and they should be resolved.

Third, in this study, it was analyzed how differences of recognition to implicit classroom rules could be removed with questionnaires and observation. It was found that it is necessary that teacher negotiate with a child who has different recognition from the teacher, and that teacher infer what kind of rules the child recognize from his/her behavior or utterance. At the same time, a process to remove differences through a change of classroom rule was found. In previous literature, how teachers could make children, who had different recognition from his/her teacher, follow classroom rules has been

studied. In those cases, it has been assumed that difference could be resolved by children’s adjustment to the rules. In other words, the process that teacher and a child change compoundable rule through negotiation has not been assumed. This study suggested a process that differences could be removed by changing classroom rules.

These implications can be linked to development children’s citizenship. In this study, it was found that there is a process that differences of recognition can be removed through interaction between a teacher and children and modification of classroom rules. This modification in classroom may develop children’s citizenship. Dewey (1916) claimed in his book “Democracy and Education” that democratic society is a society that members can adjust institutions through interaction, and that education of habituating to attribute changes to society is necessary to realize such a society (p.160).

As Dewey said, to habituate attribution of changes to society means “citizenship” in this study. This study suggested the possibility that citizenship can be developed in class, indicating that resolving differences can go through the process of classroom rules modification. As found in this study, children might understand that classroom rules can be flexibly adjusted through negotiation with their teacher if differences occurred in class. In addition, it is possible that children learn strategies to interact with their teacher for classroom rules modification. Although classroom rules are not the same as institutions in civil society, there are some similarities between them such as following in groups and functioning to go on group living smoothly. It is expected that children understand that intuitions can be flexibly modified as classroom rules. Furthermore, it is also expected that learning strategies to interact for modification can be linked to developing children’s citizenship habituated attribution of changes to society.

Classroom rules are inherent in the class. So it is likely that the rules are different in other classrooms. However, there are classroom rules to regulate children’s patterned behavior in every classroom. Thus there is a possibility that teachers and children recognize classroom rules, and that differences of recognition to classroom rules occur. This study focused on differences of recognition to classroom rules, not classroom rules itself. It is possible to apply the findings in this study to analysis in other classrooms because differences of recognition can occur in every classroom.

This study has some limitations: first, “Questionnaire about recognition to classroom rules” should be revised or redeveloped. The authors made out each item on the questionnaire based on classification from the pre-exam, without conducting exploratory factor analysis. It was because the results

could have been distorted by the ceiling effect found in most of the items and high correlated function between classroom rules.

Second, classroom rules are contingent. For instance, a rule extracted from Analysis 1 is also contingent. The results may be different in the questionnaire with assumption of another situation. It cannot be concluded that the rules in the result of questionnaire are universal classroom rules given priority in classrooms. The questionnaire should be revised which has more items of situation to conflict and which has answer columns to rank order more than three classroom rules.

Third, it is necessary to indicate differences of recognition. In this study, it could not be clarified that differences were actually removed based on the questionnaire. We can make a point that findings of this study are related to removal of differences of recognition by demonstrating that differences were resolved, conducting questionnaires at several times in the procedure of this study.

Finally, the process how classroom rules change should be further researched. In this study, the investigation period was from October to December, which has been said that not many explicit instructions about classroom rules are given in class. It will be necessary to investigate that findings of this study can be applied to other classrooms, for example, first graders’ classes soon after entrance and over second graders’ classes in April where explicit instructions about classroom rules are given to children. If we do this, findings of this study can be further demonstrated.

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## Endogenous Development of Professional Group through Lesson Study *Experience in Zambia on the Formation of Kyozaikenkyu Team*

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**Abstract** Ensuring both institution and autonomy in the teacher professional development is important, but it is not easy to realize it. Zambia has taken unique strategies of institutionalization of lesson study and formation of professional group called Kyozaikenkyu (which means literally intensive study on teaching/learning materials) team. Through analysis of their activities and questionnaire result, this paper discusses three aspects of professional group in teacher development program, especially implemented at school level such as lesson study practice of teachers. The first aspect is institution and autonomy for nationwide dissemination. It needs scaling up of local success to nation; however, it is not possible to improve teachers' competence nationwide through simply distributing particular formats. The second aspect is values shared by professional group members. In Zambia, the members selected problem solving method of teaching and Kyozaikenkyu practice of teachers as central strategies for the lesson study. The importances of these strategies are shared by the members with certain beliefs. The third aspect is quality of lesson study and participants' competence. Quality of lesson study and participating teachers' competence relate to each other, but the relation does not automatically ensure the improvement. The practices of Zambian professional group to make this relation moving forward are introduced. Based on these discussions, the importance of professional group to continuously make efforts in having practices to improve lessons and generalize their experience is emphasized as endogenous development. The work is seen as very gradual and not easy to be transferred; however, it is a work of connecting theory and practice.

**Keywords** Endogenous Development, Teacher Professional Development, Professional Group, Kyozaikenkyu

### 1. BACKGROUND

Baba & Nakai (2011) discussed necessity of looking at both institution (spreading) and autonomy (deepening) in the teacher professional development. However, the former has a tendency of uniformity and implies policy-based approach, and the latter implies and encourages individual creativity. In this sense, they are rather opposite in nature even if both intend professional development. Our discussion is that professional development and quality improvement of education at large require such a difficult task to integrate such a different and even sometimes irreconcilable nature of works. quite

Although we find difficulties in integrating institution and autonomy, we think we are able to see some possibilities in existing efforts. We would

like to take up such a case as formation of a core professional group with Zambian government's initiative. Here we are able to manifest partly integration of individual autonomy and government's institutional efforts. This group is called a team of Kyozaikenkyu (hereafter abbreviated to KK team). Kyozaikenkyu (Takahashi, 2011) is Japanese word which means literally an intensive study on teaching/learning materials. In this context, Zambia has taken unique strategies of institutionalization of lesson study with a formation of KK team, who takes professionally autonomous initiative.

In Zambia, the Ministry of Education, Science, Vocational Training & Early Education (hereafter the Ministry) introduced lesson study at the secondary schools of Central province in 2005 under the technical cooperation of Japan

International Cooperation Agency (JICA). The lesson study focuses mathematics and science, which are the most important but still weak areas. After two years of implementation, lesson study was extended to the secondary schools in Copperbelt and Northwestern province as well as the primary schools in Central province. Now it has been introduced to 2,682 primary and secondary schools in the country involving 41,243 teachers (MESVTEE, 2014). The Ministry continuously makes efforts to extend it to all the schools in nationwide with its policy and institution (MESVTEE, 2010).

In the process of introducing lesson study in the additional provinces, selected officers and teachers in the Ministry had opportunities to participate in several JICA training programs in Japan. They have learned and understood the problem solving and the inquiry method of teaching as strategies of improving quality of lessons and lesson study. Thus these strategies were introduced to the workshops and the lessons at classroom levels; however, it was found that many teachers had difficulties to apply those methods at classroom because they did not have sufficient knowledge and skills, which were required for implementation.

It is in this situation that twelve (12) officers and teachers, who were working as core technical personnel for lesson study, were selected as the above-stated KK team in 2012. They were expected to take roles of adapting and enhancing kyozaikenkyu in Zambia. And at the same time, the Ministry extended lesson study to all the ten provinces. JICA supports this Zambian government and also KK team’s efforts through training in Japan and dispatching experts to Zambia, and giving technical advices.

## 2. RESEARCH OBJECTIVES AND METHODOLOGY

The objective of the research is to take up the case of the professional group, which symbolizes

autonomy, and clarify some of their characteristics and its impact on the process of institutionalizing lesson study in Zambia. To attain this objective, the activities and perceptions of this professional group are discussed using a case method focusing on three perspectives below.

### 1) Institution and autonomy in nationwide dissemination (Baba & Nakai, 2011)

Institutionalization helps people in introducing and extending practice to nationwide, especially with uniformed format and tools; however, it does not always guarantee a quality of practice, if implementers think they conduct a lesson study because it is requested or forced without understanding the necessity and thus having sense of autonomy. In Zambia, in the process of spreading the lesson study to the whole nation, these incidences of non-autonomous participation were observed. At the same time the Ministry selected technical members as the KK team to overcome this problem of non-autonomous participation. Their experience is useful to discuss relation between institution and autonomy.

### 2) Values of professional group

While the above professional group members starts work with autonomy, they share common understanding about the background and problems, which necessitated introduction of lesson study in Zambia, and thus values within their own activities. Under this autonomy, they learned and adapted better methods for implementation of lesson study, not being forced by the outsiders. These understanding and values shared among the professional group are indication of their roles in balancing institution and autonomy.

### 3) Professional competence of professional group and its impact

Quality of lesson study is said to depend on competence of participating teachers (Fernandes, 2009). In Zambian case, it is crucial to address the issues on how the professional group

improves their competence and also how their improved competence makes an impact on the others' competence. Study on impact will give us an idea on how efforts as individuals, as a team and as wider group could be enhanced each other for implementation and improvement of the lesson study.

In order to attain the above objectives, the government reports are scrutinized and thoughts and experience of KK team members (12) and JICA personnel are gathered through questionnaire and interview.

### 3. SUMMARY OF THE ACTIVITY RELATED TO PROFESSIONAL GROUP

As stated, the professional group was intentionally formed by the Ministry under technical cooperation project with JICA. The purpose of formation is to build capacity of core professional group for the

improvement of mathematics and science lessons and lesson study. This group consists of six (6) members in mathematics and science respectively. They are mixture of educational officers such as resource center coordinators, standards officers, education office managers, educators such as principal and lecturers at college of education and teachers at schools. All of them are majored in mathematics and science.

The activities shown in Table 1 have been strategically arranged for KK team for a period of four years from 2012 to 2015 under the JICA support. One of the two main activities is the training program on the kyozaikenkyu which is organized by Hiroshima University. And the other is lesson study workshop in Zambia with experts dispatched from Japan. The activities are intended for KK team members to acquire basic knowledge and skills of kyozaikenkyu, realize them at classroom, and deepen them with practical experience.

Table 1. Activities planned for developing professional group

Year	Activity for KK Mathematics team (6 members)	Activity for KK Science team (6 members)
2012	<ul style="list-style-type: none"> <li>• Lesson study workshop supported by Japanese experts</li> <li>• JICA Training Program for kyozaikenkyu (1) in Japan</li> </ul>	
2013	<ul style="list-style-type: none"> <li>• Lesson study workshop supported by JICA short-term experts</li> </ul>	<ul style="list-style-type: none"> <li>• JICA Training Program for kyozaikenkyu (1) in Japan</li> </ul>
2014	<ul style="list-style-type: none"> <li>• JICA Training Program for kyozaikenkyu (2) in Japan</li> </ul>	<ul style="list-style-type: none"> <li>• Lesson study workshop supported by JICA short-term experts</li> </ul>
2015 (Planned)	<ul style="list-style-type: none"> <li>• Lesson study workshop supported by JICA short-term experts</li> </ul>	<ul style="list-style-type: none"> <li>• JICA Training Program for kyozaikenkyu (2) in Japan</li> <li>• Lesson study workshop supported by JICA short-term experts</li> </ul>

Apart from the above activities, KK team members have been continuously working as core technical personnel for extending lesson study to schools and

also improving its quality. And they periodically meet to exchange idea and field experience. These disseminating and improving efforts and periodical



meeting under the program for lesson study are summarized in Table 2.

Table 2. Major activities conducted by professional group members

Level	Activity	Activity/Role of KK members	Frequency
Individual	Self-study	<ul style="list-style-type: none"> <li>• Have further study on kyozaikenkyu</li> <li>• Write report/paper based on observation and experience</li> </ul>	Any time
KK team	Periodical team meeting	<ul style="list-style-type: none"> <li>• Share idea and experiences with other members</li> <li>• Have common understanding on kyozaikenkyu practice</li> <li>• Obtain new knowledge and skills</li> </ul>	Every 3 months
School	Participation in lesson study at schools	<ul style="list-style-type: none"> <li>• Implement lesson study with view point of KK and learning of student</li> <li>• Give comments to teachers based on kyozaikenkyu experience</li> <li>• Find a good practice and challenges of teachers in planning and delivering lessons, and especially in adapting kyozaikenkyu practice at schools</li> </ul>	1 – 2 times per month
District / Province	Participation in Meeting/Workshop/Seminar	<ul style="list-style-type: none"> <li>• Orient officers on lesson study and its implementation</li> <li>• Facilitate sessions related to kyozaikenkyu and teaching/learning method</li> <li>• Monitor sessions in workshops/seminars and provide advice from kyozaikenkyu perspective</li> <li>• Give technical comment to organizers to improve contents of workshops</li> </ul>	3 – 5 times per year
National	Participation in meeting for reviewing curriculum Practicing writing textbook	<ul style="list-style-type: none"> <li>• Share technical comments with curriculum officers for improving curriculum</li> <li>• Deepen understanding on subject contents and kyozaikenkyu through writing a draft textbook for pupils</li> </ul>	1 – 2 times per year

#### 4. FINDINGS IN THE FIELD IN RELATION TO PROFESSIONAL GROUP AND LESSON STUDY

Evaluation reports (MoE & JICA, 2010) mentions that one of the crucial factors for the success in extending lesson study was commitment and sense of autonomy of core officers in the program. However, the reports also tell that not all the schools are conducting lesson study effectively and some schools seem to have it as a routine or requirement by the government. In other words,

despite autonomous committed officers, there is still difficulty to influence teachers at school level and officers at district/provincial levels to create much wider autonomy.

Thus, in this research we administered the questionnaire to 12 members of KK team in order to grasp how they perceive their own change and the change of other teachers and education officers. We have received responses from 10 members. Here, we would like to analyze the responses from mathematics and science members.

The contents of the questionnaire are as follows. Firstly it is to ask important points of the

lesson and lesson study and to seek what they value in those. Secondly, it is to ask their changes and the reason for the changes. Lastly, it is to ask how their changes have made an impact on others. Through

those questions, we intend to see an indication of forming professional knowledge and values through their self-perception and assessment of their impact on others.

1. What aspect(s) of the lesson study do you think is (are) important and why?
2. What aspect(s) of the Kyozaï-Kenkyu do you think is (are) important and why?
3. How has your thinking on the above changed before and after participating in the JICA training for Kyozaï-Kenkyu and technical inputs of JICA experts under the project? Why did such change happen?
4. According to your assessment, how much do you think the above thinking has been shared among the KK team members and the members in your affiliation/province/district? In case you have felt any enhancing or hindering factors, please also state the reason(s) for them.

Figure 1. Questions regarding perceptions by professional group members

Tables 3 and 4 as Annexes summarized ideas given by ten (10) members of the KK team to each question. Answers vary among the members, although core ideas have many similarities.

- Important aspects of lesson study and kyozaikenkyu (Items 1 and 2)
  - Every phases of lesson study – Planning, delivering and evaluating lessons
  - Culture of community practice – team work
  - More focuses and studies on learners and anticipation of responses
  - Particular focus on problem solving and inquiry process
  - Importance of thinking concepts and values on subject contents
- How thinking has changed and its reason (Item 3)
  - (Previous – before studying kyozaikenkyu)
  - Before it was ‘collaborative planning’ based on a difficult topic.
  - I didn’t know what preparation is needed for quality lessons.
  - Teaching and learning materials for me were just ordinary materials used in lessons.
  - (Current – after studying kyozaikenkyu)

- Lesson planning is not just as a routine, and lesson study is not being done on scheduled days designed.
- Correlation between effective classroom deliveries and effective prior planning
- More attention to learners pre-knowledge and responses and planning based on them
- Deep study of materials
- Always look for concepts and values on the contents
- Idea on teaching materials were widened
- Have extra-eyes to see lessons in terms of preparation for pupils and process for learning
- Developed effective analytical abilities for lesson observation and evaluation
- Put pupils at a center in the lesson (Teacher as facilitator)
- Learners are not empty vessels (Reason for the change)
- Due to practical experiences on KK and observation of lessons by experienced teachers.
- Dissemination of kyozaikenkyu Practice (from results of item 4)
  - (Progress of dissemination)
  - Shared among the K.K team members quite

extensively.

- Shared among the college lecturers.
- Among the district members and some primary and secondary teachers in process
- Not so much shared among the teachers in the province
- Establishment of model schools, production of a book on kyozaikenkyu

(Difficulties in dissemination)

- Setback lies in lack of appreciation/ skepticism from colleagues, cultural nature of teaching
- Due to negative attitude and resistance among teachers
- Among the participants at subject association meetings
- Due to the cascade model used in rolling out certain interventions.
- Existence of grey areas of understanding on kyozaikenkyu among the members (not fully understood)
- Inadequate time to share due to business of KK team members caused by usual work
- Shared and harmonized understanding between mathematics and science teams
- Inadequate funding for having workshops for sharing experience

Scrutinizing ideas given by professional team members tells the following points.

The KK team members were selected by a reason that they were committed to the work under the program and understood significance of lesson study. In addition, in the process of trials and errors in introducing lesson study to schools, members had become to think that problem solving and inquiry methods of teaching could be introduced to Zambian lessons as core strategies. The words such as “problem solving”, “inquiry”, “team work” and “reflection” which they stated as important factors are related to their experiences and process of being selected as professional group. Although each member uses different expressions, all of them realized importance and necessity of problem solving, inquiry method based on kyozaikenkyu

practice to improve mathematics and science lesson and lesson study. On the level of sharing this, they are confident with the fact that same ideas are shared among the team. This tells us that, even if the expressions vary, the professional group members maintain shared time and experiences on the implementation of lesson study and improvement of kyozaikenkyu practice.

On the other hand, they answered that they were facing difficulties in disseminating knowledge and skills on kyozaikenkyu, when they work at school, district, province and national levels. One of the reasons mentioned by the members is a culture shared by teachers. It is not easy to break through current practices. Teachers neither need to have further study of subject contents once they mastered nor to analyze students’ ideas and understanding. Another reason mentioned is a cascading approach. The KK team members have to disseminate their ideas on kyozaikenkyu and teaching methods through workshops conducted at district, provincial and national levels, since it is not possible for them to go around all the schools in the country. They stated an issue that, even though teachers participated in the workshop and got some ideas of kyozaikenkyu, it was not sure that they could share it with their colleagues. The third reason which some members mentioned is the fact that the concept and practice related to kyozaikenkyu cannot be understood or mastered in a short period of time. It was pointed out that even professional group members still have “grey areas” of understanding kyozaikenkyu. Considering this fact, it would be necessary for teachers to continue their kyozaikenkyu practice for certain years of time with trials and errors.

## 5. DISCUSSION

The above findings are discussed from three perspectives mentioned earlier.

### 5.1 Institution and Autonomy for Nationwide Dissemination

Professional group has realized a certain level of autonomy both individually and as a team. An evidence of their autonomy are their initiative and commitment for continuing their own studies and writing KK handbook based on their experience. It is, however, not possible to improve other teachers' competence nationwide through simply developing handbook and formats, because those materials are simply tools made in the process of their study. This difficulty appears in the expressions such as “Lesson planning is not just a routine” and “Cultural nature of teaching”. And it is related to the thoughts and attitudes behind these expressions. Professional group faces the challenge in developing ways of transferring their thoughts and attitudes. A few teachers have started catching the thoughts but internalization will take more time, and besides the professional group still need to study and deepen themselves.

### 5.2 Values of Professional Group

As revealed in the research, some parts of competence are easily changed and others are difficult to be changed. It is similar with the transfer. Values stay behind the thoughts and attitudes in order to transfer competence which cannot be easily changed or transferred.

In this vein, problem solving lesson and kyozaikenkyu, which have been selected through practices as central strategies, represent formation of new values. This selection is made possible not

only by the technical assistance from donors but also by the autonomous judgment of the KK team. Act of selection contains accumulated knowledge as well as value-laden judgment, which is supported by understanding of context of Zambia.

### 5.3 Competence of Professional Group and Its Impact

Improvement of individual competence of the KK teams is a precondition for an effective work as a team and influences others. Quality of the lesson study and teachers' competence are considered to relate to each other (Fernandes 2009), but the teachers' competence does not automatically ensure the improvement of the lesson study. In order to make this relation moving forward, practical application and reflection are necessary. As a step forward, now KK team works hard to initiate this process at individual and group levels, and have developed a few good practices. It is, however, not simple to transfer developed good practices to other areas and topics and other teachers. Because it requires deep reflection and thoughts, other teachers need time to understand significance and digest method and such a process is seen as very gradual.

## 6. CONCLUSION

Summarily speaking, endogenous development of professional group requires overcoming tendency of dependence on manuals. In other words, it requires developing professionals, who can think and work autonomously according to the requirement of context. They are aware of institution but not bound fully by the institution, and work independently and autonomously utilizing the institution. In this sense, the professional group in Zambia – KK team – exemplifies a unique case although they are still at germination stage.

Persisting to autonomy should neither limit the

scope of work nor keep a good practice at special case alone. Or persisting to scaling up too much should not lead to mechanical dissemination at nationwide with no deep thoughts and reflection. It is there we can see the tension between institution and autonomy as mentioned in the beginning. The case in Zambia shows that the KK team is forming and sharing new professional values and knowledge under this tension. Furthermore, they cannot easily share those with other members within provinces, districts and even their own schools, despite of their tremendous efforts.

From now on, it needs a trifle expression integration between practice and theory in order to proceed in this difficult situation. That means that the leaders within each country such as the KK team, Zambia should make an effort to generalize an individual case through extensive practices and contextualize a general theory into its own situation. More specifically, it requires creation and accumulation of its country-specific professional knowledge and terms to describe the cases. For this purpose, the major universities in each country will play an important role. However, their participation into practice at school level is very slow, partly due to negative assets during the colonial period.

The future issues for the Zambian case are the two points.

It is important to discuss more specifically what is being gained in the individual case of lesson and topic by the KK team. It can lead to description of formation of professional knowledge.

Another point is the long term perspective. It concerns involvement of universities for accumulation of subject-wise research and professional knowledge. Academic association and conferring the doctoral degree are the most necessary for endogenous development of the research. Development of professionalism itself should be institutionalized. Again, the tension between autonomy and institution will stand there. If this tense relation will create driving force, then we are able to conceptualize a new dimension of lesson study.

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Table 3. Responses by mathematics members of professional group

	T1	T2	T3	T4
1	<p>Collaborative planning: Deep study of teaching/ learning materials and reflection on how to involve and utilize learner’s ideas. Discuss Lesson and Reflect on its Effect: The teachers learn how to analyze the lesson. Teaching the revised Lesson: It is important because it is an early measure of improvement.</p>	<p>Every stages of Plan-Do-See</p>	<p>Problem solving because it involves identifying topics that may be difficult to teach. In which case teachers put their ideas together to come up with the best way to teach a particular topic.</p>	<p>a) Diagnostic and detailed analysis of student learning. It helps to improve teaching and ultimately, the achievement of the intended forms of learning. b) Fellows commenting on the lesson for sharing the strengths and weaknesses. Through this practice, everyone gets enriched in both knowledge of content, and pedagogy.</p>
2	<p>The pre-requisite connections of topic at various levels and how to frame the Key or pivotal question How best to promote mathematical thinking and expression</p>	<p>Planning with viewpoints of learners, eclectic teaching, reflective lesson evaluation</p>	<p>Preparation of learner centered lessons. Improved skills. Intensive study of teaching/ learning materials. because comparing various materials and choose the most suitable one</p>	<p>The careful analysis of the topic in relation to the unit, topic or lesson: Connections of concepts in a systematic pattern i.e. the current and previous topics, within the topic and topics coming ahead.</p>
3	<p>Before it was not important to engage in the deep study of materials. Now, clear correlation between effective classroom delivery with effective prior planning</p>	<p>More attention to learners responses</p>	<p>Now lesson planning not just as a routine but as a thorough research on the materials. Analyzing the textbooks and comparing pupils’ pre- knowledge with the content of the lesson</p>	<p>Before it was ‘collaborative planning’ on a difficult topic. Now, anticipation of learners’ responses and plan based on them. Due to experiences and observation of expert teachers.</p>
4	<p>Among KK members we have had meetings to harmonize our understanding of the KK approach. Facilitators are trained and this also calls for total transformation of our attitudes.</p>	<p>Establishment of model schools, production of a book on kyozaikenkyu Setback lies in lack of appreciation/ skepticism from colleagues, cultural nature of teaching</p>	<p>Shared among the K.K team members quite extensively. Shared among the college lecturers. Among the district members and some primary and secondary teachers in process Due to negative attitude and resistance among teachers</p>	<p>Shared quiet extensively among the KK members Not so much among the teachers in the province Due to the cascade model used in rolling out certain interventions. It takes a lot of time for kyozaikenkyu to be accepted and be given the support.</p>

Table 4. Responses by science members of professional group

	T5	T6	T7
1	All the eight steps of the lesson study cycle and the facilitators & stakeholders workshops Teachers have opportunities to do the practice by collaborative planning for their lessons, implementing the planned lessons and reflecting on the implemented lessons. This way there is a culture of community practice which unifies teachers in the professional aspects despite varying levels of qualifications.	a) Planning –You can tell from the plan the amount of thinking and reflection the teachers do when planning a lesson. b) Lesson Delivery – Because it brings out the strong and weak points of the demo teacher c) Post-Demo discussions – Because the quality of the next demo – lesson depends on the input at this stage.	All aspects of lesson study are important.
2	<ul style="list-style-type: none"> <li>• Consideration of learners’ ideas and background</li> <li>• Linking instructional materials to teaching</li> <li>• Situation setting</li> <li>• Searching questions focusing on Higher Order Thinking Skills</li> </ul>	a) Planning stage: The success of the lessons is depended largely on how much time and thought we invest at the planning stage. b) Delivery stage: There are four (4) focus areas of kyozaikenkyu, 1)learner’s motivation and interest, 2)higher order Thinking, 3)Representation and expression, and 4)Knowledge and understanding.	All aspects of Lesson Study and KK are important because for a lesson to be meaningful, a teacher has to go through a process of studying the lesson before thinking of how to deliver it. This involves all the stages of studying the teaching and learning materials and other practices in the classroom that can make a great impact during lesson delivery.
3	I have acquired ‘extra eyes’ because what I viewed as good lesson before I now consider it needing more attention. The post demo discussions in lesson study at school level have gaps which the practice of kyozaikenkyu has the potential to seal. It is very true that Lesson Study is incomplete on its own without kyozaikenkyu practice.	a). developed a new way of seeing a lesson. b). The training has helped me understand the meaning and significance of the “kyozaikenkyu” practice which promote Learner - Centered education. c). developed effective analytical abilities for lesson observation and evaluation in terms of content, pedagogy and education values.	Previously I knew that it was important to prepare lessons before teaching, but I did not know much on the extent of what is involved in preparing a quality lesson. After studying and practicing kyozaikenkyu, now I know that it is important to practice enough kyozaikenkyu for lessons to be more effective.
4	The multiplier effect has not been done to a larger extent. The few model schools in Central province are trying to conceptualize the process in their science and mathematics lessons.	a) all the KK team members share the same understanding, although we still have some grey areas b) harmonization of understanding between the Mathematics and Science KK members. Major constraints: a) inadequate funds, b) negative attitudes by some teachers, c) limited knowledge	This thinking has been shared with the other KK members, teachers and officers through meetings, interact and workshops, stakeholders’ workshops and Subject Association Conferences. · Hindering factors; inadequate time to share, inadequate resources to enable KK members scale down the practice to many more teachers

	T8	T9	T10
1	The part of planning together (team work) and discussing the lesson after it has been delivered with a view of improving it.	All the 8 steps of lesson study meant a lot to me.	Collaborative planning and review of the lesson has been up-skilling for most of the teachers in both content, methodology and more in handling of practical aspects.
2	Teaching which brings out the values and concept which remain with the learner throughout his or her life.	All the aspects in Kyozaikenkyu are important especially in that; 1) need to know children 2) thinking good questions to motivate learners to think 3) arrange learners' investigation 4) enhance learners' observation and recording skills	The idea of taking teaching and learning materials as agents of change or tools for paradigm shift from popular teacher – centered to learner centered approaches. Additionally, the awareness and promotion of individual learning styles tends to impact greatly in the learners.
3	My thinking has changes to always look for concept and values in all that I do at work.	<ul style="list-style-type: none"> <li>• It has helped me to realize that as a teacher I am a facilitator of the learning process and not to dominate the process</li> <li>• My thinking after the training has helped me put the learner at the centre of the learning process.</li> <li>• The learner is not an empty vessel; they have something they know on every topic you may want to teach.</li> </ul>	Initially, teaching – learning materials was restricted, in our understanding to just those teaching aids that were normally used to consolidate an objective or learning point in a lesson, but after training the idea has widened and the application has deepened to a lot of areas.
4	We have shared with everyone during the stakeholders meeting, but it will require some time to sink in people's heads.	The aspect of kyozaikenkyu lesson has been shared and understood by some teachers, but there is need to continue practicing. The province has not yet fully been introduced to the kyozaikenkyu methodology, only a few selected schools have been oriented. There is need to introduce it to all the schools.	We have shared idea amongst ourselves as KK members and to our colleagues; however, the number of unreached teachers still remains large. There is still need to roll out the various aspects of this practice to schools. Equally, the need for more hands – on – activities for teachers remain high and, therefore, attention should be paid to our multiplier effect proposed models.



## Lesson Study in Initial Teacher Education

### *Opening The Door To A Holistic Understanding Of What It Means To Be A Teacher*

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**Abstract:** This paper draws on research conducted by the Lesson Study Research Group at the University of Leicester using a modified form of lesson study in pre-service teaching practice placements. Three one-year projects were conducted involving a total of 44 student-teachers and 39 school-based mentors. Drawing on insights from our research and from the work of Hargreaves and Fullan (2012) on ‘Professional Capital’ and on Biesta’s (2014) discussion of educational wisdom, the paper proposes an alternative to the current focus on standards-driven teacher education. Lesson study opened up the pedagogic black box for inquiry and investigation by both student-teachers and mentors. As a result, the conference presentation challenges the prevailing approach to teacher education, in which student-teachers are supervised but plan lessons in relative isolation, arguing for a collaborative inquiry-oriented approach that focuses on the growth of what we term ‘pedagogic literacy’ rather than just the competences of individual student-teachers. The conference paper argues with a framework for understanding the growth of teacher professionalism as continual and collaborative, lesson study is a very useful vehicle for use in teaching practice placements, with the potential to set new teachers on the path to growing their pedagogic literacy, while also offering mentors opportunities for pedagogic growth.

**Keywords:** Your paper must have at least two but not more than six keyword. The text should be set in 9-point font size. Please use a comma as a separator between keywords.

## 1 INTRODUCTION

In this conference paper, our purpose is two-fold, firstly, to review potential impacts of a focus on standards-related ‘performativity’ on initial teacher education (ITE); secondly, to generate debate about the conceptualisation of teaching in ITE, we propose an alternative framework for understanding and supporting the ‘professional growth’ of teachers, one that challenges the current ‘managerialism’ (Stevenson and Wood 2013) that assesses individual teacher skills and performance, treating teaching as a collection of standards to be achieved. This perspective is based on our lesson study research in ITE (Cajkler et al 2014a, 2014b, Wood and Cajkler 2013; Wood and Cajkler 2014), the work of Biesta (2014) concerning the role of teachers in education and on the concept of Professional Capital (Hargreaves and Fullan 2012).

Content of ITE programmes is often determined by externally-given lists of ‘professional standards’ (e.g. DfE 2012). Consequently, a ‘performative’ and ‘technicist’ expectation may prevail (Wilkins and

Wood, 2009; Biesta 2014), leading to conceptualisations of teacher development as instrumentalist and objectives-led (Edwards and Thomas 2010), with trainee-teachers required to demonstrate competence in a set of narrowly-defined classroom standards, while often working in relative isolation. Despite this, a ‘reflective’ aspiration is seen as a ‘sine qua non’ (Edwards and Thomas 2010, 404) of any programme. Despite the fact that programmes are generally school-based in England, however, Edwards and Protheroe (2003) offer a challenging critique of current practices claiming that school placements fail to offer student-teachers real opportunities to learn from experienced mentors, largely because there is very little collaborative work. Current models of observation and feedback, they argue, do not allow student teachers to learn through ‘peripheral participation’ in the work of experienced teachers (Lave and Wenger 1991) and offer few opportunities to explore how teachers interpret and mediate subject knowledge to facilitate students’ learning.

## 2 CASE STUDIES OF LESSON STUDY IN INITIAL TEACHER EDUCATION

The Lesson Study Research Group (University of Leicester) has sought to reconcile, through the use of lesson study, the tensions between standards-driven ITE and the need for reflective inquiry in programmes of teacher preparation. In this paper, we summarise our emerging thinking drawing on research with trainee-teachers (2011-14) in a number of schools.

Drawing inspiration from the work of Fullan and Hargreaves (2012) on Professional Capital and other lesson study researchers (for example, Dudley 2011, Lewis 2002, 2009), the Lesson Study Research Group (University of Leicester) introduced lesson study to ITE programmes. The projects were conducted initially in two university-led ITE programmes (Cajkler et al. 2013; Wood and Cajkler 2013) and then, in the third project, with 30 secondary school student-teachers in a school-based initial teacher training (SCITT) programme (Wood and Cajkler 2014). We used Communities of Practice (Wenger 1998, 2000) to frame the three projects in which we evaluated the effectiveness of lesson study to support student-teachers' and mentors' professional growth.

The approach used involved a modified form of lesson study (Cajkler et al. 2013; Wood and Cajkler 2013; Wood and Cajkler 2014), employed during eight-week teaching practice placements with student-teachers and their mentors. The cycle followed a similar pattern to a standard Lesson study cycle (Lewis, 2002; Dudley, 2014), but involved the asymmetric relationship between mentor and student-teacher. A total of 44 student-teachers and 39 mentors participated in the three projects.

The distinguishing characteristic in this form of lesson study was that the mentor and student-teacher collaborated in the design, teaching and evaluation of a cycle of two (or more) research lessons. The first lesson was taught by the mentor and then, following evaluation and revision, the second research lesson was taught by the student-teacher (stages 4 and 5 in Figure 1), although in some cases participants were able to work in a triad with another participating teacher.

Where possible, the use of interviews with the students who had been observed during research lessons was encouraged. This was a useful addition

in helping student-teachers to understand in more depth the learning processes they had observed during the lessons. For the SCITT programme (the third of our studies), stimulated recall interviews were conducted in some schools and these proved to be enlightening.

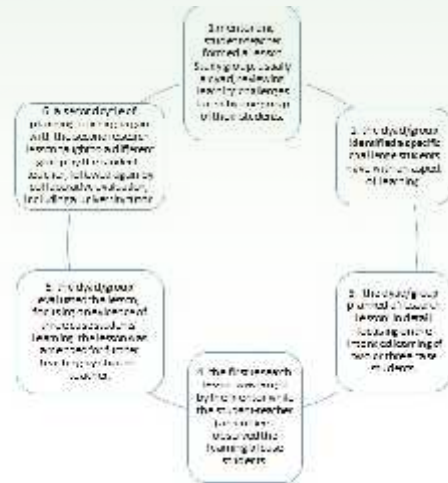


Figure 1: Initial Teacher Education Lesson Study Cycle for Use in a Practicum

The projects were framed by Communities of Practice (Lave and Wenger 1991, Wenger 1998, 2000) evaluating the effectiveness of lesson study as a vehicle to support the development of sustainable pedagogic skills (O’Leary 2014; Stigler and Hiebert 1999). Mentor and student-teacher lessons in the LS cycle (see figure 1 above) were observed and recorded. Data were collected from recordings of planning/evaluation meetings and post-lesson study interviews and subjected to detailed thematic analysis using a constant comparison approach.

It is not our purpose to present individual project findings but to draw conclusions from the work done in schools and discuss the implications for teacher education in general.

### 2.1 Benefits of mentor-student-teacher lesson study in ITE

Principal benefits identified from all three projects by both student-teachers and mentors were that, despite differences in experience, status and power, lesson study engaged mentors and student-teachers as learning-partners so that they confronted, in collaboration, the complexity of teaching and learning. This, we argue, was the principal achievement of lesson study in the teaching practice

placements, a collaborative opportunity to explore the complex system of processes that make up teaching and learning from planning through to evaluation. Edwards and Protheroe (2003, 239) have argued that if student-teachers are engaged with their mentors in guided participation in the acts of teaching this would offer a framework for mentors to act ‘as mediators of responsive pedagogy as a body of cultural and professional knowledge’. This contrasts with the traditional approach to ITE in which student-teachers’ work is subject to observation and feedback, with relatively little joint exploration of pedagogy. The typical model, criticised by Edwards and Protheroe (2003) above, has the student-teacher:

- a) usually planning alone,
- b) receiving some feedback on the plan, sometimes not long before the lesson begins (a scenario which some former student-teachers have described to us)
- c) being observed teaching the lesson
- d) receiving feedback and being asked to note some targets for ‘next-lesson’ action.

In contrast, findings from the three projects suggest that when student-teachers and their mentors engaged in lesson study in an open and critical way, both participants experienced growth in their understanding of the multi-layered nature of teaching and learning.

It must be noted that we also identified some weaknesses in using lesson study. While some student-teachers found the opportunity to be involved in lesson study a deeply reflective and generative process and identified significant changes in their levels of confidence, a small number in each group identified some drawbacks. In total, 44 student-teachers were involved, six of them reporting significant difficulties with the process. For example, one SCITT trainee wrote about the non-engagement of his mentor, a failure on the part of the mentor to learn the process and do anything other than go through the motions. Two student-teachers in the university based programmes were told what the focus of the lesson study cycle would be (with no room for negotiation) and one complained of being spoon-fed, the latter a danger in any student-teacher-mentor context.

A more general concern was expressed (often by mentors) about the availability of time to do justice to the lesson study process. So, we would not argue

that lesson study can be implemented in teaching placements without having to address and overcome challenges. In the SCITT programme, trainees reported that they were more invested in the process than their mentors. Mentor readiness and time to engage in the process were the most frequently reported challenges.

Despite these weaknesses, our three studies suggested that with mentor-led lesson study cycles could be fruitfully implemented with two research lessons during the course of an eight-week practicum. For 38 of 44 participants, lesson study opened a window into the complex processes of teaching, helping student-teachers learn how to teach from engagement in practice (Hiebert et al. 2003), opening up for investigation what we called ‘the pedagogic black box’ (Cajkler and Wood 2015).

## 2.2 Towards Pedagogic Literacy in Initial Teacher Education

At an early point in our ITE research projects, it became apparent that student-teacher and mentor collaboration in lesson study not only led to a positive impact for the student-teacher, but also for the mentor. Reflecting on this, we coined the term ‘pedagogic black box’ (Cajkler and Wood 2015) by which we mean that lesson study provides a space and a focus to open up inquiry into pedagogy, an area often left closed. Our experience in researching lesson study leads us to agree with Hargreaves and Fullan (2012) that authentic collaborative work between teachers brings professional growth. We take this to demonstrate that teachers each grow their practice, when allowed, through interplay of their values, individual experience and collaborative endeavour. In addition, this complex interaction exists within a contextual environment which plays a crucial role in establishing organisational, policy and societal frameworks. The complex network of factors and processes come together to underpin the concept of what we term ‘pedagogic literacy’.

This concept begins from a simple idea, that part of what it means to be human is ability and a readiness to teach. However, the development of pedagogic skills for use in schools is a multi-dimensional process including reflection on, and enactment of, values and philosophies, as it is values which inform judgements (Goepel 2012). To develop the skills and knowledge to become a teacher requires explicit and prolonged application. It involves reflection both individually and in collaboration with others. Teachers do not act in isolation and therefore need to understand and

accommodate organisational policies and understand the context of their work in relation to societal issues.

This leads to a model of pedagogic literacy based on a range of foundations (figure 2 below). It is important to stress that these foundations are intertwined processes that are not hierarchical or temporally disjointed. Figure 2 is an emergent yet incomplete view of the foundations and central processes that contribute to pedagogic literacy, one that we hope to explore with colleagues at the 2014 WALS conference. The notion implies a complex dynamic vision of how teaching develops.

Crucially, however, pedagogic literacy includes, at its core, the ability to interpret what is happening in lessons through a heightened awareness of how learners respond to teaching (the central core of what happens in real time in classrooms). This, we argue, is the core of pedagogic literacy. It is more than PCK (pedagogic content knowledge, Shulman 1986), we believe, as it involves learning to read

the ability to make context-sensitive pedagogic decisions:

*they have attentional skills which enable them to ‘read’ the activity of the classroom.*

This, we would argue, is the essence of pedagogic literacy, the ability to read the classroom and make appropriate learner-responsive decisions. We recognise that the difficulties of seeking to represent pedagogic literacy in a visual or written form. However, we conclude that conceptualising ‘learning to teach’ as the acquisition of a set of standards is insufficient to prepare new teachers for the complex realities of the classroom and consequently propose the concept of ‘pedagogic literacy’ as an alternative holistic framework for understanding how teachers and teaching evolve through a process of continuing and supported professional engagement.

This concept has grown out of lesson study research (Cajkler et al. 2014) and reflection on the ideas of professional capital (Hargreaves and Fullan 2012) and professional judgement (Biesta 2014).

Lesson study, as with other forms of collaborative action research, can contribute to setting teachers off on a journey of learning how to learn to teach, including the ability to research one’s own practice and develop it. There is widespread evidence, also confirmed in our lesson study projects, that the work of teachers is, in the main part, unquantifiable and relies on complex, contextualised processes and situations. As Biesta (2014, 129-130) states,

*because education is multi-dimensional, teachers constantly need to make judgements about how to balance the different dimensions; they need to set priorities - which can never be set in general but always need to be set in concrete situations with regards to concrete students.*

This results from the inherent complexity of classroom environments and the people who teach and learn within them (Cajkler et al 2013, 2014a/b). Therefore, pedagogic literacy is deliberately conceptualised as an attempt to move towards a comprehensive but always incomplete understanding of the multi-dimensional aspects of teaching: a holistic understanding which must always remain to some degree incomplete because to capture the true and total complexity of pedagogy is not possible.

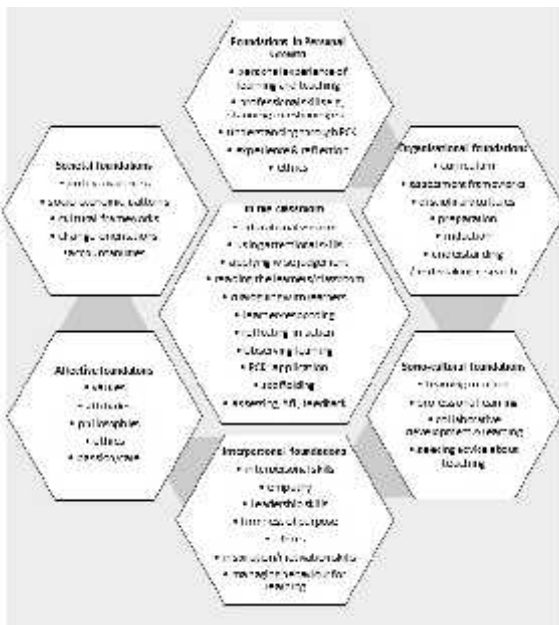


Figure 2: Outlining elements of pedagogic literacy: an emergent view

learner responses and make adjustments in action, echoing Schön’s (1983) reflection-in-action. Ainley and Luntley’s (2007, 1137) discussion of attentional-dependent knowledge makes reference to reading the classroom and offers a similarly holistic, dynamic view of what it means to be a teacher with

### 3 CONCLUSIONS

Our research into Lesson study has uncovered possibly more questions than it has answered. Far from pedagogy being a collection of discrete competences, it is the result of a complex interplay of processes and skills, many of which are highly contextual. We see the growth of pedagogic literacy as being an emergent process which takes time to develop, involving personal and collective discussion, reflection and experience. Biesta (2014, 134) considers this issue through his question 'How can we become an educationally wise person?' The answer extends beyond any simple notion of research-based practice. We argue that it is important for teachers at the very least to develop a 'research literacy' enabling them to interact with research findings in a critical but positive way to judge the validity of claims and understand how they might integrate research findings which they believe to have value within their classrooms. However, experience and reflection on experience are also crucial in the development of pedagogic literacy.

Judgement, according to Biesta, is not definable through documents and standards. It is the result of understanding and experience, a gradual process of accretion and refinement. Educational wisdom is the result of continual learning as pedagogy is a continually emergent process responsive to specific contexts and to specific learners. Use of lesson study in ITE is just one example of how student-teachers can focus on a holistic view of what it means to be a teacher, but the process takes time, dedication and all participants being open to discussion and debate.

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## The Effects of Visual and Sound Information of English on The Improvement of English Skills

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**Abstract:** This study attempted to provide evidence that there was a distinctive difference on the effect of learning through the comparison of two different teaching methods: Method 1 used prepared handouts and cards posted on the blackboard and Method 2 used a DVD and slides which could expose the students to a visual and sound oriented learning environment. Method 1 was conducted in an English Communication class for 2<sup>nd</sup> year students in 2013. Handmade handouts contained blanks with parentheses for the students to fill in with the purpose of increasing their work output. Handmade cards were posted on the blackboard and used as visual effects to promote students' understanding. Giving the students continuous writing tasks and utilizing visual cards maintained their concentration during lessons. In Method 2, the DVD which provided pronunciation practice of new words and textbook sentences, translations of Japanese, listening questions, phrase reading, and answer checking on exercises, was programmed with native English speakers' English and well-designed colorful pages. Especially in pronunciation practice, the students had various kinds of practice. We also controlled the interval of the flash cards. We analyzed the scores of the midterm exams and conducted independent *t*-test to compare group means. The results indicated that Method 2 was more effective than Method 1 ( $t(70) = -4.86, p < .01$ ). In other words, the results suggest that the visual and sound oriented presentation of information of English has a large effect on English learning, while the use of handouts and cards has only a small effect. The results of the comparison of these two different methods showed how effective DVD teaching/learning materials were when they were used like a game to motivate students.

**Keywords:** visual effects, sound, DVDs, English learning

### 1 THE PURPOSE OF THIS PAPER

I'd like to describe our research and analysis to you and provide evidence that there was a distinctive difference on the effect of learning through the comparison of two different teaching methods:

**Method 1** We used prepared handouts and cards posted on the blackboard.

**Method 2** We used a DVD which exposed the students to a visual and sound oriented learning environment. In addition, to show grammar points, we created slides with colorful explanations on the computer and displayed them on a screen, in order to provide another visual effect. Your paper will be part of the conference proceedings. Therefore we ask that authors follow the guidelines explained in this example.

### 2.1 PREVIOUS STUDIES

Many researches on teaching with visual aids have been done before from different points of view.

Suzuki (2006) focused on a two-dimensional spatial display and graphic organizers rather than on a one-dimensional spatial display, for example, pictures, phrase reading etc and stated 'Their cognitive burden can be reduced by the advantage of increased computation efficacy through visual argument'. Sakamoto (1989) compares lessons between a student teacher and a skillful teacher from the standpoint of the use of audio-visual aids. As a result, a skillful teacher tried to support coherence with visual aids, while a student teacher tended to make incoherence. Hata (2003) introduced a method that used DVDs, especially films, with the textbook to prove it possible to teach through a textbook, not to teach a textbook but. Osawa (1995) stated that having said the role of the teacher is a key, 'using audio-visual facilities, students recognized, understood and used these features, and finally integrated them into their own learning to achieve communicative fluency.'

## 2.2 Who are the participants?

The students belong to a college of technology, a **k sen** school, 5-year science-oriented college for 15-years-old students or older. There are 63 institutions in Japan; most were established by the national government. Most of the institutions are technical schools, each with an enrollment of about 200 students per grade, focusing on engineering and mercantile marine studies.

Method 1 was conducted in an English Communication class for 2<sup>nd</sup> year students in 2013. The number of the students in a class was 45. Method 2 was conducted in another English Communication class for 2<sup>nd</sup> year students in 2014. There were also 45 students in a class. Both of the students majored in Mechanical Engineering. The levels of their English ability were fairly the same, according to the TOEIC IP Test. The TOEIC Bridge IP test scores on average were 113.7727 points as for the students in 2013, while the average scores were 114.0909 points as for those in 2014. There was only 0.3 point difference between these students. Therefore we can say that the levels of their English ability were almost the same.

## 2.3 Methods: How differently were the classes conducted?

**Method 1**: We used these teaching materials.

Text: *Powwow*. Tokyo: Bun-Eido, 2012.

Handmade handouts: handouts for each lesson part contained blanks with parentheses for the students to fill in with the purpose of increasing their work output. These handouts were made in order to lead the students to a smoother comprehension of the textbook.

Handmade cards: cards with colorful letters and signs were posted on the blackboard and used as visual effects to promote students' understanding. *In a way*, the colorful lettering was aimed at creating visual effects. Yet, I'm trying to say if it was not on the same effective level as Method 2, which is going to be talked about soon.

With these materials, giving the students continuous writing tasks and having visual cards eventually maintained their concentration during lessons. We created two remarkably different situations: one was full of sounds of pronunciation practices, and the other was a very quiet situation where the students concentrated on writing tasks.

**Method 2**: We used the DVD material.

Text: *One World*. Tokyo: Kyoiku Shuppan, 2014.

The DVD material: this provided pronunciation practice of new words and phrases, translations of Japanese, listening questions, and answer checking on exercises.

In the pronunciation practice of new words, we had a flash card practice activity and controlled the

interval from 0 to 5 seconds. We had a word practice activity from English to English, from English to Japanese, and from Japanese to English. In the past we practiced English by repeating after a native speaker's pronunciation recorded on CDs. In this method our students had both native speakers' pronunciation practice and visual effects along with a thrilling game-like time controlled interval all at the one time.

In the practice of textbook sentences, we also controlled the interval from 0 to 5 seconds. As they listened to English, the read words turned red so they could check the spelling visually and the sound of the words at the same time.

When they checked the Japanese translation, on the pre-given homework handouts with blanks, they could check each phrase by sharing their ideas in class. With a click of a mouse, a pointed phrase turned red. Therefore they could visually check the meaning in both English and Japanese.

When checking the answers in exercises, the right answers were promptly identified with colourful letters. So immediately after giving the students' own answers, they could know the result promptly with just one click of a mouse. Therefore, they could get involved in the exercises without losing their interest.

The reading practice activity had a distinctive difference from Method 1. It was programmed with native English speakers' English and well-designed colourful pages. Especially in the pronunciation practice activity, the students had various kinds of practice. For example, they could practice from English to Japanese, and vice versa. We also controlled the interval of the flash cards so that we could create an exciting game-like atmosphere where the students got involved naturally and just like a game, they even began to compete with each other.

## 3 RESULTS AND ANALYSIS

We analyzed the scores of the midterm exams that the students took in May of each year, and conducted independent t-test to compare group means. The results indicated that Method 2 was more effective than Method 1 ( $t(70) = -4.86, p < .01$ ). In other words, the results suggest that the visual and sound oriented presentation of information in English had a significant effect on English learning, while the use of handouts and cards had only a small effect. The results of the comparison of these two different methods shows how effective DVD teaching/learning materials can be when they are used like a game to motivate students. Method 2 not only motivated the students, involving them in classroom activities spontaneously, but also led them to achieve higher scores in English tests.



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## The Supporting of School-Based Lesson Study (LSBS) to Teacher Performance Appraisal (PKG) and Teacher's Continuous Professional Development (PKB) in SMAN 9 Bandung

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**Abstract:** Nowadays teachers performance and teachers professional development are important to discuss on educational context in Indonesia. The Government has developed program to assess teacher's performance and teacher's continuous professional development. The teacher's performance appraisal is called PKG to assess all teacher activities as well as developing lesson plan, teaching learning activities and student assessment. The teacher continuous professional development is called PKB to assess teacher activities as well as scientific forums. The School-based Lesson Study called LSBS has facilitated to PKG and PKB, because trough LSBS the teacher can enhanced quality of teaching, conducting class action research, developing handout, teaching media and scientific article or papers. LSBS in SMA 9 Bandung has initiated on 2005, until now more than 40 school teachers have involved to LSBS.

**Keywords:** LSBS, PKG, PKB

### 1. PENDAHULUAN

Berdasarkan Undang-Undang Republik Indonesia Nomor 14 Tahun 2005 tentang Guru dan Dosen Bab I Pasal 1 ayat 1 diterakan bahwa guru adalah pendidikan profesional dengan tugas utama mendidik, mengajar, membimbing, mengarahkan, melatih, menilai dan mengevaluasi peserta didik pada pendidikan usia dini jalur pendidikan formal pendidikan dasar, dan pendidikan menengah. Undang-undang nomor 14 tersebut mengisyaratkan bahwa keberadaan guru adalah sebagai pendidik dan juga sebagai suatu pekerjaan yang memiliki jabatan rangkap, yaitu jabatan fungsional dan jabatan profesional. Guru memiliki tugas, tanggung jawab, dan wewenang dalam melaksanakan kegiatan persekolahan formal sebagai pendidik pengajar, pembimbing, pengarah, pelatih dan penilai peserta didik ketika mereka menempuh pendidikan formal.

Tugas profesi guru selain sebagai pengajar juga pendidik dan pelatih. *Mendidik* berarti meneruskan dan mengembangkan nilai-nilai hidup. *Mengajar* berarti meneruskan dan mengembangkan ilmu pengetahuan dan teknologi sedangkan *melatih* berarti mengembangkan keterampilan-keterampilan pada peserta didik (Usman, 1989).

Pekerjaan guru yang utama terkait jabatan fungsional dan keprofesionalannya adalah melakukan suatu kegiatan yang disebut dengan kegiatan pembelajaran terhadap peserta didik. Kegiatan pembelajaran dimaksud meliputi kegiatan menyusun rencana pembelajaran (RPP), melaksanakan pembelajaran yang

bermutu, menilai dan mengevaluasi hasil pembelajaran, menyiapkan dan melaksanakan program perbaikan dan pengayaan terhadap peserta didik.

Tidaklah berlebihan kalau dikatakan bahwa masa depan masyarakat, bangsa dan negara, sebagian besar ditentukan oleh guru. Oleh sebab itu, profesi guru perlu dikembangkan secara terus menerus dan proporsional menurut jabatan fungsional guru (PMPTK, 2010). Untuk menjalankan tugas dan fungsi keprofesionalan dengan baik dan berkualitas, seorang guru dituntut untuk secara berkelanjutan melakukan program peningkatan dan pengembangan diri. Program dimaksud yang tersedia saat ini adalah program Penilaian Kinerja Guru (PKG) dan program Pengembangan Keprofesionalan Berkelanjutan (PKB). Program tersebut merupakan barometer keprofesionalan dari seorang guru.

PKG sangat diperlukan agar fungsi dan tugas yang melekat pada jabatan fungsional guru dapat dilaksanakan sesuai dengan aturan yang berlaku. PKG akan menjamin terjadinya proses pembelajaran yang berkualitas di semua jenjang pendidikan. Melalui PKG dapat diidentifikasi secara tepat berkaitan dengan kegiatan guru di dalam kelas, dan membantu guru untuk meningkatkan pengetahuan dan keterampilannya. Hal ini akan berdampak secara langsung pada peningkatan kualitas pembelajaran yang dilakukan guru, sekaligus membantu pengembangan karir guru sebagai tenaga profesional.

Implikasi dari PKG akan menuntut peran professional guru untuk senantiasa melakukan inovasi-inovasi dan kreativitas dalam melaksanakan proses pembelajaran. Tuntutan tersebut oleh guru dapat diantisipasi melalui kegiatan pengembangan profesionalisme yang diantaranya berupa kegiatan *Lesson Study*. Beberapa alasan mengapa dilakukan *lesson study* untuk meningkatkan mutu pendidikan termasuk didalamnya adalah kualitas pembelajaran adalah:

1. Program peningkatan profesionalisme guru yang telah ada kurang berdampak terhadap peningkatan kualitas pembelajaran di kelas (Widodo, Riandi, Wulan & Amprasto, 2006).
2. *Lesson study* dinilai sebagai rahasia keberhasilan Jepang dalam peningkatan kualitas pendidikannya (Stigler & Hiebert, 1999). Melalui kegiatan unggulan *lesson study* guru dapat bertukar pendapat ataupun berdiskusi dengan teman-teman dalam kelompok mata pelajaran di sekolah baik itu sebelum melakukan pelaksanaan pembelajaran yaitu pada penyusunan RPP, pada proses pembelajaran atau setelah proses pembelajaran (refleksi). Hasil dari kegiatan tersebut diantaranya adalah guru dapat mencoba menerapkan inovasi-inovasi baru dalam pendidikan khususnya dalam inovasi pembelajaran di sekolah. Bentuk inovasi pembelajaran ini meliputi berbagai aspek penting dalam pelaksanaan kegiatan belajar mengajar yang meliputi:
3. Kegiatan pembelajaran berpusat pada peserta didik (*student centered*), dimana sebelumnya pelaksanaan pembelajaran cenderung satu arah yang didominasi guru
4. Pengembangan metode dan pendekatan yang digunakan selain diskusi-informasi juga inquiri,
5. Pengembangan bentuk pertanyaan yang diajukan kepada peserta didik menjadi *pertanyaan produktif*, sebelumnya pertanyaan yang biasa diajukan guru berupa konsep/ hafalan. Dengan menggunakan pertanyaan produktif para peserta didik dituntut untuk melakukan aktivitas dan berpikir sistematis ketika menjawabnya/ para peserta didik juga lebih berani menjawab pertanyaan yang dilontarkan guru, dan dari jawaban seorang peserta didik guru dapat mengarahkan pertanyaan lainnya sehingga pemahaman peserta didik tentang suatu materi/ konsep lebih komprehensif,

6. Pembelajaran lebih mengutamakan "*hands-on activity*", sehingga kegiatan teori dan praktikum tidak lagi dipisahkan tetapi dipadukan dalam jam yang sama. Hal ini membuktikan bahwa belajar harus ditempuh dengan melihat, merasakan dan mencobakan,
7. Mengevaluasi peserta didik tidak hanya pada hasil tes saja tapi juga pada saat proses pembelajaran (*authentic assessment*), dimana sebelumnya peserta didik dinilai pada akhir suatu pembelajaran tetapi sekarang pada saat proses pembelajaran berlangsung penilaian sudah bisa dilakukan apakah itu aspek pengetahuan, praktik atau sikap.

Aspek-aspek inovasi pembelajaran sangat mendukung penerapan konsep belajar bermakna dari Ausubel (1963) yang menyatakan bahwa belajar merupakan suatu proses mengkaitkan informasi baru pada konsep- konsep yang relevan. Dimasa sekarang proses pembelajaran di kelas, peserta didik diharapkan lebih banyak belajar mandiri, sedangkan guru hanya sebagai pemandu/ fasilitator/ salah satu sumber belajar dan bukan merupakan pusat sumber belajar.

## 2 IMPLEMENTASI LESSON STUDY DI SMAN 9 BANDUNG

Perintisan implementasi *Lesson Study* di SMAN 9 Bandung dimulai tahun 2005. SMAN 9 Bandung yang merupakan salah satu sekolah mitra Universitas Pendidikan Indonesia sejak tahun 2003 telah menjadi *Piloting School* untuk mengujicobakan hasil-hasil pengembangan inovasi pembelajaran matematika dan IPA (Fisika, Kimia, Biologi) sebagai produk *The Improvement of Mathematics and Science Education Project* (IMPSTEP). IMSTEP merupakan program peningkatan kualitas pendidikan matematika dan IPA melalui peningkatan kualitas pendidikan calon guru MIPA. IMSTEP terselenggara atas kerjasama Pemerintah RI dengan Jepang melalui *Japan International Cooperation Agency* (JICA).

Sejak tahun 2005 guru-guru dari SMAN 9 Bandung mengikuti kegiatan *lesson study* di berbagai kesempatan baik di dalam sekolah sendiri maupun di sekolah lain melalui aktivitas MGMP. Aktivitas *lesson study* di SMAN 9 pada tahun-tahun berikutnya semakin berkembang karena didukung oleh program PHKI-C yang merupakan program kerjasama UPI dan Disdik Provinsi Jawa Barat. PHKI-C telah mengembangkan *Lesson Study Berbasis Sekolah* (LSBS). Melalui LSBS semua guru menjadi terlibat dalam implementasi *lesson study*, baik tahap *Plan, Do* maupun *See*.

Program LSBS yang dirintis PHKI-C, di SMAN 9 ditindaklanjuti oleh pihak sekolah dengan memasukkan program tersebut ke dalam Program APBS untuk pengembangan profesionalisme guru. Melalui LSBS mandiri ini, setiap guru mata pelajaran diwajibkan untuk melakukan *open lesson*.

Setelah melaksanakan kegiatan *open lesson* para guru terlihat:

1. lebih berani dalam mengemukakan pendapat tentang pembelajaran di kelas
2. untuk menyusun RPP didiskusikan terlebih dahulu dengan teman-teman sekelompoknya (MGMP)
3. lebih percaya diri pada waktu tampil dalam pembelajaran di kelas
4. lebih siap untuk disupervisi oleh kepala sekolah dengan timnya.

Pelaksanaan Penilaian Kinerja (PK) Guru di SMA Negeri 9 Bandung dilaksanakan pada saat yang bersamaan dengan kegiatan *open lesson*. Pada saat melakukan penilaian, penilai masuk ke dalam kelas di mana guru melakukan KBM sebagai observer. Guru yang melaksanakan pembelajaran (guru model), sebelumnya mengkonsultasikan RPP nya terlebih dahulu kepada penilai. Pada pelaksanaan refleksi, penilai ikut serta dalam refleksi dan mendapat informasi-informasi tambahan dari para observer untuk aspek-aspek yang tidak terpantau oleh penilai pada saat observasi. Kebermaknaan PKG yang dipadukan dengan kegiatan *lesson study* membuat para guru yang akan dinilai terkesan lebih siap dan lebih percaya diri.

## 2 PEMBAHASAN

Penilaian kinerja Guru (PKG) adalah penilaian dari tiap butir kegiatan tugas utama guru dalam rangka pembinaan karier kepangkatan dan jabatannya. PKG dilakukan dalam bentuk paket kerja, meliputi pembelajaran/bimbingan dan tugas tertentu untuk (PMPTK, 2010):

- a. pembelajaran mencakup aspek perencanaan dan pelaksanaan pembelajaran, evaluasi dan penilaian, analisis hasil penilaian, dan pelaksanaan tindak lanjut hasil penilaian.
- b. pembimbingan mencakup aspek perencanaan dan pelaksanaan pembimbingan, evaluasi dan penilaian hasil pembimbingan, analisis hasil pembimbingan, dan pelaksanaan tindak lanjut hasil pembimbingan.
- c. tugas lain yang relevan mencakup aspek guru menjadi kepala sekolah/madrasah, wakil kepala sekolah/ madrasah, ketua program keahlian/program studi atau yang sejenisnya, kepala perpustakaan, kepala laboratorium, bengkel, unit produksi atau yang sejenisnya, pembimbing khusus pada satuan pendidikan

yang menyelenggarakan pendidikan inklusi, pendidikan terpadu atau yang sejenisnya, wali kelas, menyusun kurikulum pada satuan pendidikannya, pengawas penilaian dan evaluasi terhadap proses dan hasil belajar, membimbing guru pemula dalam program induksi, membimbing peserta didik dalam kegiatan ekstrakurikuler, pembimbingan pada penyusunan publikasi ilmiah dan karya inovatif, melaksanakan pembimbingan pada kelas yang menjadi tanggung jawabnya (khusus guru kelas).

Secara umum, PKG memiliki 2 fungsi utama sebagai berikut (PMPTK, 2010):

1. Untuk menilai kemampuan guru dalam menerapkan semua kompetensi dan keterampilan yang diperlukan pada proses pembelajaran, pembimbingan, atau pelaksanaan tugas tambahan yang relevan dengan fungsi sekolah/madrasah. Dengan demikian, profil kinerja guru sebagai gambaran kekuatan dan kelemahan guru akan teridentifikasi dan dimaknai sebagai analisis kebutuhan atau audit keterampilan untuk setiap guru, yang dapat dipergunakan sebagai basis untuk merencanakan PKB.
2. Untuk menghitung angka kredit yang diperoleh guru atas kinerja pembelajaran, pembimbingan, atau pelaksanaan tugas tambahan yang relevan dengan fungsi sekolah/madrasah yang dilakukannya pada tahun tersebut. Kegiatan penilaian kinerja dilakukan setiap tahun sebagai bagian dari proses pengembangan karir dan promosi guru untuk kenaikan pangkat dan jabatan fungsionalnya.

Penilaian kinerja Guru sebagaimana dimaksud pada ayat (1) menggunakan nilai dan sebutan sebagai berikut pada Tabel 1:

Tabel 1. Contoh Rekapitulasi Hasil PKG untuk seorang guru

No.	Nilai Akhir Kinerja (NAK)	Klasifikasi
1.	91 sampai dengan 100	Amat baik
2.	76 sampai dengan 90	Baik
3.	61 sampai dengan 75	Cukup
4.	51 sampai dengan 60	Sedang
5.	0 sampai dengan 50	Kurang

Nilai Akhir Kinerja (NAK) yang telah diklasifikasikan dalam 5 (lima) level di atas, kemudian dikonversikan angka kredit yang telah ditentukan dengan cara perhitungan sebagai berikut (PMPTK, 2010):

- a. Nilai “**sangat baik**” diberikan angka kredit 125% dari jumlah angka kredit yang harus dicapai setiap tahun.

- b. Nilai **“baik”** diberikan angka kredit 100% dari jumlah angka kredit yang harus dicapai setiap tahun.
- c. Nilai **“cukup”** diberikan angka kredit sebesar 75% dari jumlah angka kredit yang harus dicapai setiap tahun.
- d. Nilai **“sedang”** diberikan angka kredit sebesar 50% dari jumlah angka kredit yang harus dicapai setiap tahun.
- e. Nilai **“kurang”** diberikan angka kredit sebesar 25% dari jumlah angka kredit yang harus dicapai setiap tahun.

Selain PKG konsekuensi guru sebagai profesi adalah pengembangan keprofesian berkelanjutan (PKB). Pengembangan keprofesian berkelanjutan adalah pengembangan kompetensi guru yang dilaksanakan sesuai dengan kebutuhan, bertahap, berkelanjutan dan dapat meningkatkan profesionalannya.

PKB adalah bentuk pembelajaran berkelanjutan bagi guru yang merupakan kendaraan utama dalam upaya membawa perubahan yang diinginkan berkaitan dengan keberhasilan peserta didik (buku 1 PMPTK, 2010). Dengan demikian semua peserta didik diharapkan dapat mempunyai pengetahuan, keterampilan lebih baik, dan menunjukkan pemahaman yang mendalam tentang materi ajar serta mampu memperlihatkan apa yang mereka ketahui dan mampu melakukannya.

PKB mencakup berbagai cara dan/atau pendekatan dimana guru secara berkesinambungan belajar setelah memperoleh pendidikan dan/atau pelatihan awal sebagai guru. PKB mendorong guru untuk memelihara dan meningkatkan standar mereka secara keseluruhan mencakup bidang-bidang berkaitan dengan pekerjaannya sebagai profesi. Dengan demikian, guru dapat memelihara, meningkatkan dan memperluas pengetahuan dan keterampilannya serta membangun kualitas pribadi yang dibutuhkan di dalam kehidupan profesionalnya.

Kegiatan tersebut ada dalam kegiatan *lesson study*, yaitu:

1. adanya komunitas belajar (*learning community*)
2. kesejawatan (*collegiality*)
3. meningkatkan kualitas pembelajaran secara berkesinambungan (*continuous quality improvement*).
4. Peningkatan kualitas pembelajaran secara terus menerus merupakan jiwa dari penelitian tindakan kelas (PTK).

Oleh karena itu *lesson study* juga dapat dijadikan media untuk para guru dalam melakukan penelitian tindakan (*action research*).

Pada prinsipnya, PKB sama dengan tahapan *lesson study* yaitu mencakup kegiatan perencanaan (*plan*), pelaksanaan (*do*), evaluasi, dan refleksi (*see*) yang didesain untuk meningkatkan karakteristik, pengetahuan, pemahaman, dan keterampilan sebagaimana digambarkan pada diagram berikut ini (diadopsi dari *Center for Continuous Professional Development (CPD), University of Cincinnati Academic Health Center*. [http://webcentral.uc.edu/cpd\\_online2](http://webcentral.uc.edu/cpd_online2) dalam buku 1 PMPTK, 2010).



Gambar 1 Tahapan PKB  
Sumber: Kementerian Pendidikan dan Kebudayaan (2012)

PKB digunakan untuk dapat memperkecil jarak antara pengetahuan, keterampilan, kompetensi sosial dan kepribadian yang guru miliki sekarang dengan apa yang menjadi tuntutan ke depan berkaitan dengan profesinya itu. Kegiatan PKB ini dikembangkan atas dasar profil kinerja guru sebagai perwujudan hasil PKG yang didukung dengan hasil evaluasi diri. Adapun kegiatan PKB bagi guru-guru yang hasil penilaian kinerjanya:

1. masih berada di bawah standar kompetensi atau berkinerja rendah diwajibkan mengikuti program PKB untuk mencapai standar
2. telah mencapai standar kompetensi, kegiatan PKB-nya diarahkan kepada peningkatan keprofesian agar dapat memenuhi tuntutan ke depan dalam pelaksanaan tugas dan kewajibannya sesuai dengan kebutuhan sekolah dalam rangka memberikan layanan pembelajaran yang berkualitas kepada peserta didik.

Secara umum, keterkaitan antara PKG, PKB dan pengembangan karir profesi guru dapat diperlihatkan pada diagram berikut ini (buku 1 PMPTK, 2010):



Gb.2. Pedoman Pengelolaan PKB  
Sumber: Kementerian Pendidikan dan Kebudayaan (2012)

Beberapa manfaat PKB bagi guru adalah sebagai berikut.

1. Memfasilitasi guru untuk mencapai standar kompetensi profesi yang telah ditetapkan.
2. Memfasilitasi guru untuk terus memutakhirkan kompetensi yang mereka miliki sekarang dengan apa yang menjadi tuntutan ke depan berkaitan dengan profesinya.
3. Memotivasi guru-guru untuk tetap memiliki komitmen melaksanakan tugas pokok dan fungsinya sebagai tenaga profesional.
4. Mengangkat citra, harkat, martabat profesi guru, rasa hormat dan kebanggaan kepada penyandang profesi guru.

Peter Senge (2000) mengingatkan perlunya mengembangkan sekolah sebagai sebuah organisasi pembelajar. Di antara karakter utama organisasi pembelajar adalah senantiasa mencermati perubahan internal dan eksternal yang diikuti dengan upaya penyesuaian diri dalam rangka mempertahankan eksistensinya.

Syarat mutlak terciptanya organisasi pembelajar adalah terwujudnya masyarakat pembelajar di tubuh organisasi tersebut. Ini dapat dengan mudah difahami mengingat kinerja organisasi secara tidak langsung adalah produk kinerja kolektif semua unsumnya termasuk Sumber Daya Manusia. Oleh sebab itu, dalam konteks sekolah, guru secara individu maupun secara bersama-sama dengan masyarakat seprofesinya harus didorong untuk menjadi bagian dari organisasi pembelajar melalui keterlibatannya secara sadar dan sukarela serta terus menerus dalam berbagai kegiatan belajar guna mengembangkan profesionalismenya.

### 3 KESIMPULAN DAN SARAN

Sebagai simpulan dari makalah ini, dapat dikatakan bahwa *lesson study* merupakan kegiatan

yang paling strategis untuk PKG dan PKB dalam meningkatkan profesionalisme guru sebagai pengajar dan pendidik. Semangat kesejawatan dan komunitas belajar yang terbentuk melalui *lesson study* merupakan modal untuk belajar saling menguntungkan (*mutual learning*) dalam mewujudkan guru profesional sesuai tuntutan PP 19 tentang profesionalisme guru.

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## School-Based Lesson Study to Support the Government in Succeeding the Performance Appraisal of Teachers in SMPN 1 Jatigede Sumedang West Java Indonesia

Kartoma, S.Pd., Abdul Aziz Muslim S.Hut.

**Abstract:** School-based Lesson Study (LSBS) is one of two types of lesson study is implemented by all teachers of various subjects with the principal concerned with the goal of keeping the quality of the process and the learning outcomes of all subjects in the school can be improved. The academic fields of SMP Negeri 1 Jatigede Sumedang West Java province of Indonesia has implemented that program since 2007. Related to the Teacher Performance Assessment - in 2012, in which the principal and some senior teachers as school assessment team shall periodically prepare the performance appraisal of teachers, at least 2 times. the assessment are namely formative and summative. the frequency and schedule of activities at school refer to lesson study program from the head of Quality Field of Teachers Sumedang District Education Office. Teacher performance appraisal are conducted by a team of school assessors to the teacher who opened a particular model class, according to the schedule specified by the academic field. Principals and their teams carry out an assessment to teachers following the implementation schedule of lesson study. Lesson study thus support the government in assessing teacher performance.

**Keywords:** school based lesson study, support the government, performance appraisal of teachers

### 1 INTRODUCTION

SMP Negeri 1 Jatigede is a school that is implementing school-based lesson study. All subjects carry out the lesson study with typical activities:

- Designing collaborative learning plan which reflects the student-centered learning,
- Two main activities, namely are: (1) the implementation of learning activities undertaken by one of the teachers agreed or at the request of its own to practice the lesson plan that has been prepared jointly, and (2) the activities of observation or observation made by members or Lesson Study other community (read: the teacher, the principal, or school superintendent, or other invitees who acted as observers / observer)
- Reflection activities carried out in the form of a discussion that followed throughout the Lesson Study participants were guided by the principal or other designated participants. The discussion starts from the delivery of impressions that have been practicing teacher learning, by submitting comments or general impression as well as a special impression on the learning process does, for example regarding the perceived difficulties and

problems in implementing lesson plans that have been prepared.

The writers consider that teacher is a professional educator who has the task, function, and an important role in educating the nation. Professional teachers are expected to participate in national development to realize the Indonesian people who fear God Almighty, excel in science and technology, has a soul aesthetic, ethical, noble character, and personality. Implementation of the main tasks of teachers can not be separated from the ability of a teacher in the mastery of knowledge, application of knowledge and skills

In order to establish the teaching profession as a dignified profession, namely to achieve the vision of a national education through quality learning process, it should be carried out the Teacher Performance Appraisal and on a regular ongoing basis.

The Teacher Performance Appraisal System is a scoring system designed to identify the teacher's ability to carry out its duties through the measurement of competence demonstrated mastery in their performance.

### 2 THEORITICAL

## 2.1 Lesson Study

### Understanding of Lesson Study

According to Garfield, 2006 lesson study is a systematic process used by Japanese teachers to test the effectiveness of teaching in order to enhance learning outcomes. Systematic process in question is working collaboratively teachers to develop lesson plans and tools, observation, reflection, and revision of the plan pembelajaran cyclic and continuous basis. According to Walker (2005) Lesson study is a method of professional development of teachers. According to Lewis (2002) ideas contained in the actual lesson study is short and simple, that is, if a teacher wants to improve learning, one of the most obvious ways is to collaborate with other teachers to design, observe and reflect on the lessons.

In more operational lesson study is a model of professional development of educators through collaborative learning and assessment based continuous principle of collegiality and mutual learning to build a learning

community in order to improve professionalism teachers and to improve the quality of learning

The main focus of Lesson Study is the development and learning of the student, for example, whether students show interest and motivation to learn, how students work in small groups, how the students perform the tasks set by the teacher, as well as other matters relating with activity, participation, as well as the condition of each student in the learning process. Thus, the focus is no longer only focused on how teachers teach as usual in a classroom supervision conducted by the principal or school superintendent.

SlametMulyana (2007) explores the implementation of the two types of Lesson Study, which is a school-based Lesson Study and Lesson Study based MGMPs. School-based Lesson Study carried out by all the teachers of the various fields of study with the principal concerned with the goal of keeping the quality of the learning process and the results of all subjects in the school can be further improved. While Lesson Study MGMPs an assessment based on the learning process carried out by a group of teachers of certain subjects, with the deepening of the study of learning in certain subjects, which can be implemented at the level of regions, districts, or perhaps could be extended again.



All materials on each page should be set to fit the paper size of A4 (210x297 mm). The document margins should be set to the following:

- Top: 3 cm;
- Bottom: 3 cm;
- Left: 2,5 cm;
- Right: 2,5 cm.

Authors should set the Section Start to Continuous with the vertical alignment to the top and the header is set to 1,5 cm and the footer is set to 2 cm.

## 2.2 Title and Authors

This section must be in one column. The title (Times New Roman 15-point), authors' names (Times New Roman 11-point) and affiliations (Times New Roman 9-point) run across the full width of the page. We also recommend you to include e-mail address (Times New Roman 9-point). Please see the top of this page for three addresses. If only one address is needed, center all address text. For two addresses, use two centered tabs.

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Use 14-point type for the title, aligned to the center, linespace exactly at 18-point with a bold font style and initial letters capitalized. No formulas or special characters of any form or language are allowed in the title.

### 2.2.2 Subtitle

Use 13-point type for the subtitle, aligned to the center, linespace exactly at 18-point with bold and italic font style. The initial letters should be capitalized.

### 2.2.3 Authors and Affiliations

Authors' names should be aligned to the center with linespace exactly at 13-point. The text must be set to 11-point. Affiliations should appear aligned to the center. Affiliation information should include organization, address, and email address.

### 2.2.4 Abstract

Abstract is required all categories of paper. Your abstract should be one paragraph summarizing the content of the paper and should consist of not more

than 250 words. Use Times New Roman of 9-point size and justify with a hanging indent of 2 cm.

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Your paper must have at least two, but not more than, six keywords. The text should be set in 9-point font size. Please use a comma as a separator between keywords.

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This section must be in two columns. Each column must be 7,5-centimeter wide with a column spacing of 0,8-centimeter. The section text must be set to 10-point, justified and single spaced.

### 2.3.1 Section Titles

The heading of a section title should be in Times New Roman 12-point bold in all-capitals flush left with an additional spacing of 12-points before and after. Sections and subsequent sub-sections should be numbered and flush left.

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The heading of subsections should be in Times New Roman 11-point bold with only the initial letters capitalized. For subsections and subsubsections, a word like *the ora* is not capitalized unless it is the first word of the title.

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### 2.3.4 Tables and Figures

Place Tables/Figures/Images in text as close to the reference as possible. Tables must appear inside the designated margins or it may extend across both columns to a maximum width of 17 cm. Tables in two columns must be positioned at the top or bottom of the page within the given margins.

Tables should be properly numbered, centered and should always have a caption positioned above it. Please refer to the APA Manual. The font size to use is 9-point. No bold or italic font style should be

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Table 1. Captions with one line need to be centered and captions with more than one line have to be justified. The word “Table” is spelled out.

Column 1	Column 2	Column 3	Column 4
Row 1	Row 1	Row 1	Row 1
Row 2	Row 2	Row 2	Row 2

Figures must appear inside the designated margins or that may span the two columns. Figures in two columns must be positioned at the top or bottom of the page within the given margins. It is advisable the use of text boxes in this case.

Figures should be properly numbered, centered and should always have a caption positioned beneath the image. Captions with one line should be centered and if it has more than one line should be set to justified. The font size to use is 9-point.



Figure 1. This caption has one line and is centered.

### 2.3.5 Reference Text and Citations

References and citations should follow the APA Publication Manual (6th edition). Please see the References section, for an example).

References should be set to 9-point, justified, with a single line spacing and hanging indent of 0,5cm.

## 3 CONCLUSIONS

This guideline/template is adapted and modified from different sources to help you with the submission of your paper.

## 4 ACKNOWLEDGEMENTS

Acknowledgements should be placed before the references section. Numbering is not necessary.

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## Implementation Of Lesson Study For Trainee Teacher Of Nautical Program At Vocational School Smkn 13 Malang

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**Abstract:** SMK Negeri 13 Malang is one of vocational schools that gives widely chance to society, who has low income and free of educational expense. This school is third year now. The process of teaching and learning is in good preparation and well-done. One of the process is lesson study. The process has been done on schedule from the first semester until the fourth. During three months, from March to May 2014, the school received eight trainee teachers of Integrated Educational Programme for Teacher (Program Pendidikan Guru Terpadu- PPGT). The eight are trainee teachers of nautical program. They taught in the first year class of nautical program. One teacher of SMKN 13 Malang and one lecturer from Malang State University have been guided four trainee teachers to make lesson plan, learning how to teach and how to evaluate the activity of teaching and learning. There are three steps in lesson study, plan – do/see – reflection. The first step, plan, is used to evaluate a lesson plan they made as a preparation for teaching and learning. After that we continued to second step, Do and the third step, Reflection according to the schedule that was arranged. All trainee teachers have done lesson study activities and participated as model’s teacher and an observer. During the guidance in lesson study activities there are several problems in step Plan, that is the comprehensiveness in preparing syllabus, lesson plan, the media and learning strategic. In the step of Do/See, trainee teacher who acted as an observer had written all evidences in the lessons. In the step of Reflection, the observers gave suggestion to model’s teacher. Lesson study for trainee teachers give mutual and useful experiences as a preparation for their future about how to be a good teacher, how to teach well. If we manage lesson study intensively and continuously, it will improve the four competencies of teacher, professionally, pedagogic, social and personality competency.

**Key word:** trainee teacher of PPGT, Nautical program, lesson study

### 1. INTRODUCTION

Education is a longterm human resources which has a strategic value in improving human development. That is why almost all countries in the world places statistical variable of education as the most important issue including in Indonesia.

Many activities have been done in improving a quality of education by moving all components into a system. All those activities aim to make better quality for future generations. In order to reach the goals Indonesian government strengthen it by producing many regulations such as Rights of National Education System ( Undang-Undang Sistem Pendidikan Nasional No 20 tahun 2003 ) No. 20/2003 and Government Rules No. 19/2005 ( Peraturan Pemerintah No. 19 Tahun 2005) about a standart of national education. Indonesian government is also produces Rights of Teacher and Lecturer No 14/2005 (Undang – Undang Guru dan Dosen Nomor 14 Tahun 2005) as a tactic or approach in improving quality of education,

guarantee in widen and spread distribution evenly in access of education, by facing challanges according to local content demands, nationally and globally . The rule aimed to empower and improve a directing, planning and continuing quality of teachers and lectures.

As a part of education system in supporting Indonesian government improving quality of education, teachers should empowering teaching and learning process according to the goals and roles toward better changes through learning community. The role of national education in improving a quality of nations life is very important and strategic to create smart human life, peaceful, opened and democratic so that it must be a teaching and learning system to improve a better quality of education. There many components as a breakthrough in empowering teaching and learning process such as input, process and output aspects. Curicullum, teaching materials, media of education, educators, innovative strategic, classroom management and teaching and learning models are an important aspects in empowering

teaching and learning process. Teaching and learning process is an education system, in order to reach best quality in education is began from analyzing each component involving and influencing the process.

School is one of institutions that has an important role and strategic in education system. A good school management decides the success of education in preparing students meet their future. SMK Negeri 13 Malang is one of vocational schools that gives widely chance to society, who has low income and free of educational expense. This school is third year now. This school has 3 programs, namely : 1) nautical ( Nautika) 2) nursing program (Keperawatan) and 3) technology of post harvest program (TPHP).

The process of teaching and learning is in good preparation and well-done. One of the proccess is lesson study. The proccess has been done on schedule from the first semester until the fifth. Teacher as an agent of change and a part of education system should learn more in order to give interesting teaching and learning, efficiently and meaningful. Teacher may learn better by his own experience during the process of teaching and learning in the classroom. He may evaluate his teaching and understand the best practice and the worst he did. The best practice in teaching and learning process may come from another teacher. In this case, teacher, as an observer, can learn something from the other, as a model teacher, by observing a process of teaching and learning. From this process he get new experiences and he uses it as a material of reflection by himself.

Integrated Educational Programe for Teacher (Program Pendidikan Guru Terpadu- PPGT) is one of Indonesian Ministry of Education program and held by State University of Malang for one year. The university made cooperation to SMKN 13 Malang as a place to practice teaching and learning. There are 8 (eight) students as trainee teachers in this program. They are graduate from physic major program. Two of them are from non-education program and the others from education major program. They got nautical subject from Polomarin Semarang . They taught in the first year class of nautical program for 6 (six) month . One teacher of SMKN 13 Malang and one lecturer from State University of Malang have been guided four trainee teachers to make lesson plan, learning how to teach and how to evaluate the activity of teaching and learning.

Nautical program is one of 3 (three) programs in SMKN 13 Malang. Students in this program study in two curriculum, national curriculum from

ministry of education and IMO's (International Marine Organization) curriculum. Subjects such as navigation, mapping, deck, communication and signal, shipping and others are based on international marine curriculum.

Travers defines that learning is a process of someone that gives suitable action, Cronbach defines that learning is a change of action as a result of observing. Harold Spears defines that learning is observing, reading, imitating, trying something, listening and following a certain direction and Morgan defines that learning is a change of action permanently as a result of experience (Supriyono, 2009: 2-3).

Based on several definitions above, learning can be defined as a change in a personality, value, action of someone by observing, reading, imitating, trying and listening by experience in awareness or unawareness.

For those reasons above, it is important a teaching and learning process in open class; it means that a teacher welcomes to another teachers joint to the process in order to see, to observe the process by lesson study. Lesson study is a source of real examples about how to teach, how to learn and the role of teacher as an observer is used to improve teacher's ability in teaching and learning.

In the presence of lesson study can improve teacher's quality in teaching and learning, every teacher at SMKN 13 Malang should joint this program in order to no exception trainee teachers of PPGT . Lesson study prepares a good lesson plan, good in the process and minimalists mistakes in the process. Lesson study is an activity to learn together from another teacher, a situation of learning from others.

The aim of lesson study is (1) to improve knowledge and skills in teaching and learning, (2) to improve colleagues cooperation, (3) to improve attitude of teachers as a model and an observer, (3) to improve teacher's skill in managing learning society, and (4) to improve the ability in preparing and communicating in teaching and learning.

The benefit of lesson study for teacher is (1) to improve teaching and learning strategy, (2) opened mind and share to colleagues, (3) to improve a quality of lesson plan. The benefit of lesson study for students are to improve activity, motivation and result of studying and learning.

The benefit for institution or school is by lesson study can influence all teachers to improve teaching and learning strategy, so school or institution may overcome problems and difficulties in teaching and learning.

Lesson study is not a strategy or method in teaching and learning but it is an effort to improve a process of teaching and learning that held by a group of teachers collaboratively and continuously involves in planning, teaching, observing and reporting the process. Lesson study is an activity to support a learning community systematically and consistence for self improvement individually or managerial. ( Slamet Mulyana, 2007) states lesson study is one of models in educating professional teacher by collaborative and sustainable/continuous assessment according to colleagues principles and mutual learning to make learning community.

According to Slamet Mulyasa (2007) and a concept of Plan-Do-Check-Act (PDCA), there are four steps in lesson study, namely (1) step in planning teaching and learning (plan), (2) step in the process of teaching and learning in the class (do), (3) step of reflecting the process after teaching and learning (check) and (4) step of follow up (act).

Actually lesson study is a continuous and cyclic activity that has practical impact in education. The cycle consist of four steps, (1) goal-setting and planning, (2) research lesson, (3) lesson discussion and (4) consolidation of learning.

In a simple way, lesson study can be done by series of activities Planning – Doing – Seeing (Plan-Do-See) ( Saito, et al) (2005). The three activities is identified as a practical oriented lesson study.

## 2 RESULT OF IMPLEMENTATION

Lesson study was conducted by eight trainee teachers are divided in two groups at class X-nautical program of SMKN 13 Malang with 31 students on April 2014. The subject is all productive subject in nautical program, such as seamanship, signal and communication, navigation, mapping, deck, shipping based on curriculum of international marine organization (IMO). They act as model and observers alternately and guided by one teacher and one lecturer. They acts as observers too. All of them involved in step of plan - do and see.

The first step, plan, is used to evaluated a lesson plan as a preparation for teaching and learning. One teacher as a model gave lesson plan to observers and explained about the content of lesson plan and lesson scenario. Observers responded and gave suggestion to the lesson plan. Model gave response about lesson plan and made a note to improve the content of lesson plan in order

to make better process of teaching and learning in the classroom. Before discussing the lesson plan, team had prepared some kids such as notebook , name board, room for meeting, arrange schedule and list of participants form

The second step, Do. Model applied revised lesson plan according to suggestion in step Plan. All observers did their duty , paid attention to students' activity and made important notes about their activities.

The third step, See. This step activity was carried out after class. Leader of the meeting asked to model to express how did he/she feel during the class. Model explained the achievement, the strength and weaknesses. Observers gave reflection by small notes about all students activities.

During the guidance in lesson study activities there are several problems in step Plan, (1) comprehensiveness in preparing sillaby, (2) indicators in lesson plan, (3) assessment, (4) worksheet and (5) learning strategic.

In the step of Do/See, there several problems (1) less attention to passive students, (2) purpose of lesson, (3) time management, (4) time for test too short.

Trainee teachers made various media according to the topic and some of them have a good skill in teaching and learning. They did not nervous and tried to make good communication to students. They motivated students study hard. They have good personality in teaching and learning.

## 3 CONCLUSION

Lesson study was well done at SMKN 13 Malang, which model and observer worked together in order to improve the teaching and learning process based on suggestion given by observers. By lesson study, trainee teachers involved in school based lesson study . The activity of lesson study consist of plan, do and see. It developed colleagues between trainee teachers and teachers of SMKN 13 Malang, so they learned together, sharing experiences and creates mutual learning. By lesson study, students improve the ability in (1) discussion, (2) questioning and answering, (3) developing creativities to solve problems during the process, (4) students more active in the process ( student centered). By lesson study there are some chages, (1) better cooperation between trainee teachers, (2) better innovation, (3) more understanding about students characteristics. By lesson study students (1) get interesting teaching and learning, (2) more understand about the lesson,

(3) get better chance to explain the lesson by presentation in the class, (4) more understand to classmates, (5) familiar to guest and other teachers in the class during the lesson.

There are two suggestion, (1) lesson study should be developed to more schools and (2) attitude of welcoming of model and observers in lesson study at SMKN 13 Malang to be observed and reflected should be maintained and developed in order to improve four competences of teacher, professionally, pedagogic, social and personality competence.

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## The Effects of “Intersubject Teaching”— In The Case of Cooperative Teaching Between An English Class and A Physics Class

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**Abstract:** This study attempted to provide evidence that there was a distinctive interrelated effect on learning when we used the same teaching materials in English lessons immediately before or after physics lessons. This teaching plan was called “Intersubject Teaching”, interdisciplinary teaching, because we conducted cooperative teaching between English lessons and physics lessons. Our plan was as follows: Experiment 1: English first and physics second; Experiment 2: Physics class only; Experiment 3: Physics first and English second. In an English lesson, we provided students with a manuscript of a MIT professor who explained a physics law and demonstrated it. Students read through it for a certain amount of time without being able to look up the meaning of any words or phrases they didn’t know. Then, we shared the information we had just got and checked any difficult vocabulary and phrases, asking them some comprehension questions. The time limit was carefully calculated in order to keep students’ concentration and attention at maximum levels in a kind of time-limit exciting environment. In a physics lesson, they were shown a DVD where a MIT professor talked about how mysterious the law of gravitation is. In Experiment 1, the students had already read the professor’s manuscript in English right before the physics class, so they were directly reminded of content through watching pictures on a DVD and listening to his lecture. After each experiment, we gave the students a word test in order to check how effectively words related to physics were acquired and how well they understood those two subjects. The results from these experiments revealed that Experiment 1 and 3 didn’t show a remarkable difference, but a big difference in Experiment 2.

**Keywords:** Intersubject Teaching, cooperative teaching, physics,

### 1 A PURPOSE OF THIS PRESENTATION

This presentation attempted to provide evidence that there was a distinctive interrelated effect on learning when we used the same teaching materials in English lessons immediately before physics lessons. This teaching plan was, what I call, “Intersubject Teaching”, so-called interdisciplinary teaching, because we conducted cooperative teaching between English lessons and physics lessons.

### 2 PREVIOUS STUDIES

Hiroi (2004) tried to search for the possibility of cooperative lessons at high school between physics and math, as well as between physics and chemistry in his report “Next Subjects / Curriculums Viewed from Physics.” Kusano and Motoki (2014) conducted career education classes as cooperation between subjects. They pointed out that as a merit the students could consider their future for a longer period with various advice from various teachers, while a demerit was that it was difficult to maintain the communication between the teachers whose opinions

were not the same. Hikida (2004) emphasized in his thesis “Physics Education and English” that the more technically they learned the field, the more necessary English would be. Therefore, it must be beneficial to watch a well-known professor’s specialty lecture on a DVD.

#### 2.1 Who were the participants?

This plan was conducted in an English Communication class for 2nd year students whose major was Electrical Engineering and Information Science in 2014. The number of the students in a class was 45.

#### 2.2 Lesson Plans

Our lesson plan was as follows: we had a timetable where English was taught in the 2nd period and physics in the 3rd period on the same day.

Now I’ll describe detailed lesson plans in the English lesson. We provided students with a manuscript of a MIT professor who explained a physics law and demonstrated it by throwing a ball and catching it both on the ground and in an airplane.

The students had 7 minutes to read through it without being able to look up the meaning of any words or phrases they didn't know. They just kept reading it for a certain amount of time. Then, we shared the information we had just got from reading the material and checked any difficult vocabulary and phrases. We asked them some comprehension questions about the content of the material and after giving them a translation in Japanese, they had another 7 minutes to compare both Japanese and English manuscripts, to read them once again, and to check their understanding by themselves.

The time limit was carefully calculated in order to keep students' concentration and attention at maximum levels in a kind of exciting time-limit environment.

Now I'll talk about the plans in physics lessons. Physics lessons immediately after English lessons were purposely planned. In the physics class they were shown a DVD where a MIT professor talked about how mysterious the law of gravitation is. The students had already read the professor's manuscript in English right before this class, so they were reminded of content through watching pictures on a DVD and listening to his lecture.

Now I'll describe how we cooperated between English lessons and physics ones. Here are three experiments:

Experiment 1: English first and physics second. Both in the English class and the physics class, the students went through the process which I mentioned above. The following week, they were given a quiz to check how well they retained the words they heard and saw.

Experiment 2: Physics class only. Contrary to Experiment 1, in English class, without being given any information about the DVD they were going to see, they were shown the DVD in physics class. The following week, as well, they were given the same style word test.

Experiment 3: Physics first and English second. The order of classes was opposite to Experiment 1. In the physics class, they were shown the DVD without preparing for any technical terms. And then in the English class, they were given a manuscript on the DVD. The following week, as well, they were given the same style word test.

### 2.3 How to Analyze the Results: a Word Test

We gave the students a word test especially on how many words they acquired. We conducted the word tests both when this intersubject teaching was conducted and when it was not conducted in order to check how effectively words related to physics were acquired and how well they understood those two subjects.

The results from these three different experiments on the interdisciplinary teaching plans revealed that they came to understand the physics definitions through two different learning opportunities, and that they learned both English and physics in a cross-lesson environment. Analyzing the word tests, some special terms could naturally be mastered, which we could call 'immersion' in Experiment 1. Contrary, not as many words as those in Experiment 2 were retained. Reading ahead and watching the DVD later made a significant difference on how many words they could retain.

In Experiment 3, we had a similar result to Experiment 1. There didn't seem to be a significant difference in changing the order of those two subjects. From these three experiments, it was analyzed that they obtained information from two different angles: they read some English material and they watched and listened to the same material in a lecture on a DVD: they managed to understand English and Physics with different effort from different sources.

## 3 CONCLUSIONS

The students finally came to understand the physics definitions through two different learning opportunities, and that they learned both English and physics in a cross-lesson environment. It is analyzed that they obtained information from two different angles: they read some English material and they watched and listened to the same material in a lecture on a DVD: they managed to understand English and physics with different effort from different sources.

Physics is a useful mechanism to master scientific English words. It can promote students' memorization of English words through watching real experiments in physics classes. Their interest in physics enabled them to memorize scientific English words more smoothly, compared with a situation where we just gave them tasks to memorize the same specific words without giving physics lessons. In this way two cooperative lessons can make it possible to give the students benefit for both of the lessons.

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## Reflection on Lesson Studies for Teachers’ Professional Community *A Case Study of a Japanese Elementary School*

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**Abstract:** The aim of this study is to reflect on lesson studies for teachers’ professional community by conducting a case study of a Japanese public elementary school. This examination conducts from the viewpoint of teachers’ discourse. Why is the teachers’ discourse the key element of constructing the teachers’ professional community? This study is based on a variety of data obtained from intensive fieldwork in a Japanese school over a period of three years. The data include observational data of research lessons, lesson studies, ordinary activities, interviews with teachers and administrators, and relevant school and classroom documents. This study examines the teachers’ discourse in the lesson studies focusing on the following original discursive modes: (A) Is the alternative teaching approach better? (B) What is the best way of teaching X? (C) Did the children learn what the teacher intended them to? (D) Did the teacher teach what the children actually learned? (E) What did the teacher learn from watching the children learn? and (F) Did the teacher learn from watching the children learn? This study tries to provide suggestions to deepen our understanding of the lesson studies for professional community.

**Keywords:** reflection on lesson studies, teachers’ professional community, Japanese school

### 1 INTRODUCTION

The aim of this study is to reflect on lesson studies for teachers’ professional community by conducting a case study of a Japanese public elementary school.

Constructing teachers’ professional community is one of the most important strategy for successful school reform (McLaughlin & Talbert, 2001; Little, 2002). Teachers engage in constructing teachers’ professional community within schools. This study reflects on lesson studies focusing on the teachers’ discourse. Why is the teachers’ discourse the key element of constructing the teachers’ professional community?

This study focuses on the reflection on lesson studies: the discursive or reasoning style of teachers’ utterance.

Supporting professional development of teachers includes the following sequential phases: 1) exploring the teachers’ tasks for developing as a teaching professional; 2) identifying the development tasks; and 3) acknowledgment of achievement of the tasks. Suzuki (2012) examined the first two phases through the case study of Japanese lesson studies. This study focuses on the third phase.

The third phase is significant because it shows that a teacher is accepted by colleagues as a member of the professional community. What kind of teachers’ discourse acknowledge the teachers’ achievement of the development tasks? This examination is at the crossing of the professional community and the professional discourse.

Previous educational studies on the “professional community” of teachers (McLaughlin, 1993; McLaughlin & Little, 1993; McLaughlin & Talbert, 2001; McLaughlin & Talbert, 2006) provided the insight for this study.

McLaughlin and her colleagues have identified the professional communities as a teaching context which continued to pursue innovative teaching with today’s students. The professional communities were characterized by “the norm of innovation and learning, the ability of reflection, feedback, and problem-solving, democratic decision-making, and the development of effective teaching practice for all students”.

Previous studies on the “professional discourse” of teachers (Little, 2002, 2003; Horn, 2005; Little & Horn, 2007; Curry, 2008; Little & Curry, 2008; Horn & Little, 2010) also provided the insight for this study.

Little and her colleagues have pointed “the theory-building potential that resides in records of situated interaction among teachers in the course of their everyday work” in the professional community and tried to “open the black box of professional community.”

This study builds and expand on these lines of research from the perspective of the discursive style of teachers’ utterances in the post-lesson conference.

## 2 METHOD

Intensive case study primarily focused on teachers' discourse in post-lesson conferences held at a Japanese elementary school.

A variety of data was also obtained from the school over a four-year period from April 2007 to March 2011: observational data of research lessons, lesson studies, ordinary activities; interviews with teachers; various relevant school and classroom documents.

The elementary school has engaged in school reform for more than 10 years.

Through my fieldwork, I obtained background knowledge that enabled me to understand the local and situated meaning of the post-lesson conferences at the school. All names shown in this study are pseudonyms (see also table 1).

Six discursive modes were used as an analytical framework (Suzuki, 2012): (A) *Simple question and answer*; (B) *Is the alternative teaching approach better?*; (C) *What is the best way of teaching X?*; (D) *Did the children learn what the teacher intended them to?*; (E) *Did the teacher teach what the children actually learned?*; (F) *What did the teacher learn from watching the children learn?*

In Suzuki's study, the teacher's development tasks for developing as a teaching professional were elicited from her colleagues' discourse, which was characterised by the discursive modes (E) and (F): (E) *Did the teacher teach what the children actually learned?* and No; (F) *What did the teacher learn from watching the children learn?*

Table 1. Data used for the analysis

Post-lesson conference about a research lesson in November 2008	
Research teacher	Ms. Nagashima (fifth year teaching)
Subject matter	Arithmetic, 3rd grade, 34 children in the class
Teaching unit	Introductory multiplication computation on paper
Contents:	
• main theme	17 × 3 × 5 and 180 × 13
• main question	How many pencils are enclosed in the box?
• main activity	Mainly collaborative learning [group learning]
Teacher utterances in the post-lesson conference	25 (13 participants)
Duration	Approximately an hour and a half

This study examines what kind of teachers' discourse acknowledges the teacher's achievement of the development tasks in the professional community.

## 3 RESULTS OF ANALYSIS

By the method on this case study, we show the results of analysis (see also the table 2):

- discursive mode (A) 4 utterances
- discursive mode (D) and Yes 2 utterances
- discursive mode (E) and Yes 16 utterances
- discursive mode (G) 4 utterances
- a total of 26 utterances.

A new discursive mode, which we labelled (G), was identified first in the sequence of utterances No. 5 to No. 10 (see also the table 3 and 4).

Table 2. Teachers' discursive modes in the post-lesson conference

No.	Teacher	Discursive Mode	Reference
1	Sudo		
:	:	:	
4	Tsumori	D-Yes.	
5	Mori	E-Yes.	Tsumori
6	Mukai	G	Mori
7	Inoue	E-Yes.	Mukai
8	Okada	E-Yes.	Inoue
9	Noda	E-Yes.	Okada
10	Inoue	G	
11	Mikami	E-Yes.	Inoue
:	:	:	
26	Konishi	G	

## 4 DISCUSSION

Based on the results of analysis, we discuss the following four points (see also table 3 and 4)

- 1) The teachers' discourse was characterized primarily by discursive mode (E) and the answer Yes; (E) *Did the teacher teach what the children actually learned?* and Yes.
- 2) A new type of discursive mode (G) was identified; (G) *Did the teacher learn from watching the children learn?* and mode of (G) examined teachers' professional development in line with children's thinking and learning.
- 3) The teacher's professional development was *acknowledged* by her colleagues' characteristic discourse. They not only said 'you accomplished,' but also acknowledged the teacher's development by discursive mode (E) and the answer Yes, discursive mode (G) and the answer Yes. This suggests that there are characteristic discursive modes in the third phase for professional development; acknowledgement of achievement of the tasks.
- 4) Discursive mode (G) was generated by the middle leader and mentor for beginning teachers. They were senior teachers in the professional community. What they acknowledged depended on the character of the professional community

and the professional community was constructed and sustained through the professional discourse.

Further case studies need to be carried out to confirm this finding and deepen our understanding of the lesson studies for the professional community.

Table 3. Teachers’ discourse from No.5 to No. 7

No.	Teacher	Excerpt	Discursive Mode	Reference
5	Mori	‘Thanks very much, Ms. Nagashima. I was also looking at <i>Hiroshi’s</i> [boy] learning process. I’ve been concerned about him since the previous lesson, and I was wondering how he would act today... [describing his wrestling with the problem $12 \times 3 \times 5 \times 13$ ]... So, as written [in Ms. Nagashima’s lesson plan] “going beyond pretending to know,” well, I think Hiroshi really wrestled with the 13 boxes $[\times 13]$ ... It was very interesting to observe...’	<b>[E]</b> Did the teacher teach what the children actually learned? →Yes.	[Tsumori, No. 4]  Teaching plan
6	Mukai [Middle Leader, Nursing Teacher]	‘... That was so much fun. When I looked at Ms. Nagashima’s face at the end of the lesson, I thought, yes, it was good idea that you did that, and I wanted to tell you that... The thing that surprised me most today was that it was <i>Akira</i> [boy] and <i>Tsutomu</i> [boy] who explained things using a diagram on the blackboard. I mean it was a pleasant surprise... [describing their learning processes] ... The idea of “designing” classes [in line with the children’s thinking and learning] that Ms. Nagashima has been talking about since spring, since last year, well, that really succeeded today...’	<b>[E]</b> Did the teacher teach what the children actually learned? →Yes.  <b>[G]</b> Did the teacher learn from watching the children learn? →Yes.	Mori  Previous post-lesson conferences
7	Inoue [Mentor for beginning teachers]	‘... Ms. Mukai just mentioned <i>Akira’s</i> learning process, so first I’d like to ask Ms. Mukai about how <i>Akira</i> arrived at that [mathematical] idea. You were looking at him really intently...’	<b>[E]</b> Did the teacher teach what the children actually learned? [to colleagues] = She expected the close description of the children’s learning process.	Mukai

Table 4. Teachers’ discourse from No. 8 to No. 10

No.	Teacher	Excerpt	Discursive Mode	Reference
8	Okada	‘... Can I say something in the meantime?... When I saw the way <i>Akira’s</i> eyes were just sparkling during the lesson, I really wanted to observe him so I went over to him even though it was in the middle of the lesson... <i>Akira</i> didn’t draw all of the diagram by himself; at the beginning it was only half done. When he did his graphic explanation to other children in the group, they constructed a better diagram together. So, the diagram wasn’t made by <i>Akira</i> on his own, rather it was constructed by the four children together.’	<b>[E]</b> Did the teacher teach what the children actually learned? ↓ Yes. (response to the <i>Inoue’s</i> question)	Inoue
9	Noda	‘... I was also really attracted by the way <i>Akira</i> was smiling at me. I really wanted to observe him so I left the video camera where it was and went over to him... When I asked him why he drew the diagram, he said, “It’s easier for everyone to understand this way.” He really remembered Ms. Nagashima telling the class to “Write it in a way that everyone can understand.” He said to me as well, “It’s easier to understand this way, isn’t it?” I replied, “Yes,” “I understand it,” “Well done.”’	<b>[E]</b> Did the teacher teach what the children actually learned? ↓ Yes. (response to the <i>Inoue’s</i> question)	Okada

<b>10</b>	Inoue	<p>I'd like to hear more about Akira's learning process, but I'd also like to say something about what I observed. I was really impressed at the end of lesson...</p> <p>I observed Atsuto[boy], Kenta[boy], Nene[girl], and Mika[girl], that group of four children. Each of them approached the problems in a completely different way... Ms. Nagashima wrote in her teaching plan that she aimed to "understand the different thinking processes of each child" and "conduct classes that closely follow" these thinking processes. Each child really thought hard about which numbers to divide, how to use multiplication and division, until they got to the answer of 180.</p>	<p><b>[G]Did the teacher learn from watching the children learn?</b></p> <p>↓</p> <p><b>Yes.</b></p>	Teaching plan
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# Senior High Students’ Psychological Problems In Speaking English As Foreign Language

## *A Survey in a Senior High School in Bandung*

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**Abstract:** Teaching English in Indonesia is not typically same as in other countries. Not only does the changes of curriculum, the lack of teachers’ competences, but more importantly the students who learn English also faced some problems during the learning process. It is supported by Ariffansyah (2013), “...problem will appear if there is inappropriate between exception and reality. Another defines that a problem will happen if someone’s necessity does not fulfill.” The way of pronouncing the words and the written forms in English are counted as inappropriate reality. It makes students confused, because the written language and the oral language are different. Some of them get problems in those kinds of linguistic matters and some are more in psychological problems. Therefore the present study was aimed to discover the most common psychological problems that face by senior high students in speaking English. Quantitative method was employed by distributing close- ended questionnaire to 100 respondents out of 183 students. The result exhibited that students’ fear of derision, uneven allocation of turn, and students’ incomprehensible inputs are the most common psychological problems in speaking English which influence their oral performances. To conclude, most of the students’ problems in speaking English come from psychological aspects. Nonetheless, they are actually quite good in written performances. Thus, teachers can minimize the speaking failure by focusing on those common problems; creating a good classroom environment which are fair to every student in the classroom; free of embarrassment and fun activities, so that students can participate actively in speaking class

**Keywords:** Psychological problems, anxiety, speaking, English

## 1 INTRODUCTION

Learning foreign language yields different reactions from Indonesian students. Most of the students in Indonesia have at least two languages to be mastered; their mother tongues (local language) and Indonesian language as the second language (national language which are also used in formal education). Therefore, many students face some problems during learning English as foreign language. English become one of foreign language that needs to be taught at school in Indonesia, because it is an international language. Students can read more sources written in English to enrich their knowledge. It is supported by Alwasilah (2014), “More people now realize that their first and national language is far from sufficient for technological advancement, international communication, and other areas” (p.241). But in fact, learning English is quite complicated. According to Richards as cited in Brown (2001, p.267), “the conversation class is something of an enigma in language teaching”. Most of Indonesian students are failed using English in communication because of English’s differences in its written and oral language. These differences cause problem in their learning process. However, Brown (2001) states that the benchmark of successful language acquisition is almost always the demonstration of an ability to

accomplish pragmatic goals through interactive discourse with other speakers of the language (p.267). It emphasizes that speaking is as a predictor of the success of learning a language. Therefore, the most common students’ psychological problems in speaking English are going to be investigated in this study.

Having fact that language learners in Indonesia are not really good at speaking, it is being questioned why do they cannot speak well while they had have English as foreign language subject since elementary school; what factors that influenced them most? This fact is in line with what Musthafa (2013) said, “Education in Indonesia is failed. It is because of (1) unclear purpose of study, and (2) unfocused learning activities.” From his statement, it can be concluded that teaching has to focus on the teaching goals which are clearly stated at the very beginning. For example: teaching English to elementary students with the purpose/ goal at the end of study is students could describe their personal information deeply. So that, we can focus on creating activities in order to reach that goal. As supported by Brown (2001) that it is teacher’s role to design learning materials which suit the needs, styles, as well as goals of the learners.

Some previous studies had explored what are the students’ problems in speaking English. Juhana (2012) found that students have psychological factors

such as fear of mistake, shyness, anxiety, and the like that hinder them from practicing their speaking in English class. Moreover, Syam (2009) distributed questionnaires to confirm whether psychological factors which are causing students' speaking problems which are proposed by Tsui (in Nunan as cited in Syam, 2009) and King (as cited in Syam, 2009) also became the cause of students' speaking problem in students in a MAN in Riau.

Students' psychological problems in speaking cannot be generalized. Every student has different attitudes toward the causes of their problems. Johnson (2001) divides three types of students' attitudes in relation to language learning: attitudes towards success, attitudes towards teacher, and attitudes towards your own country (pp.134-135). Those attitudes influence students' success in learning a language. Harmer (2007b, p.123) believes that the more students have opportunities to activate the various elements of language they have stores in their brains, the more automatic their use of these elements become. That is why it is very important as Heffelfinger (2009) states, "Medical conditions and psychological factors can greatly influence the speech process as well."

Considering that psychological problems can affect the students' speaking performance, determines their success of learning a language, and these may also influence their confidence in their daily life and school environment, this study is conducted to portray the most frequent students' psychological problems in speaking English. In order to reach the objective of the study, research question is formulated as follows:

What are the most common psychological problems in students' speaking English at junior high school?

This study only sought the portrayal of students' psychological problems in speaking English. It was conducted only in one of senior high schools in Bandung, and it did not have purpose to confirm any hypothesis. So, it is study is expected to give positive impact in teaching and learning process; for both teachers and students, and also for other researchers. For teachers, it provides information to understand students' feeling toward classroom activities, so that teachers will have clear view of the suitable materials and methods that they need to employ. For the students, the researcher hopes that they could be better and overcome their problems after got right and effective treatment from their teacher, so that they can perform well. For the literature review, the researcher hope that this study could give more information; data that would be useful for further studies.

In order to avoid misunderstanding and misinterpretation in this study, the researcher was going to define some terms as follow:

- a) Psychological problems in this study means every affective factors which caused problems in speaking English, as proposed in Syam (2009) (Anxiety; Fear of making mistake; Fear of derision; Teacher's intolerance of silence; uneven allocation of turns; Low proficiency in English; and Incomprehensible input) that could cause problems in speaking.
- b) Speaking in this study means activities that acquire students to express verbal language in the school session.

## 2 LITERATURE REVIEW

### 2.1 Teaching Speaking

Teaching speaking deals with some aspect, as mentioned by Harmer (2007a, p.343), "... Speakers of English will have to be able to speak in range of different genres and situations, and they will have to be able to use a range of conversational and conversational repair strategies." This statement emphasizes that teaching speaking should in a package with all of its components and cultures. That is why, teachers should teach speaking with right way, right method and consider the students who do not have any idea about the foreign culture. It is supported by Harmer (2007b, p.128) that the teachers should be able to manage the lesson well and give more time to the students, because, "... people need time to assemble their thoughts before any discussion." That is why; time allocation becomes very important in teaching speaking. Moreover, the speaking class should provide great atmosphere where every student could participate and given same time to practice. When the students feel that the teachers understand them and treat them fairly, they will believe in our class. It means that they are confidence enough to follow all activities that have designed for them. Brown (2001, pp.62-63) believes that learners belief that they indeed are fully capable of accomplishing a task is at least partially a factor in their eventual success in attaining the task. The students with high self- confidences will be successful in the learning process and building their confidences is teachers' role.

Studying language is always interesting. As we know that language is part of culture; each language that we used has culture in it. Gonzalez (n.d.) said, "Learning a language is not just learning grammar and vocabulary; it is learning new sounds, expressions, and ways of seeing things; it is learning how to act in another culture, how to know a new community from the inside.") There are four skills that have to be mastered in learning a language; any language, including English. Nowadays, there is no doubt that English becoming one of the musts. People worldwide speak English as international

language; every gadget and media used English in their user guides. Nazara (2011) told us about it: “a huge number of conversation and other speaking course books, audios and videos are continuously published.”

New curriculum in Indonesia is being applied; it is called as Curriculum 2013. It demands activeness of learners (learner- centered approach). A language teacher should change their mindset of being the only source. It is learners that have to take the main role in activities. Law of the ministry of culture and education of Indonesia Number 65, 2013 on National Education System, suggested that learning process in an education system should be interactive, inspiring, fun, challenging, and motivating the learners to participate actively. Looking at the criteria of learning system that had been promoted by the government above, we can conclude that the good learning outcomes become the most important thing of education. So do for students of EFL (English as Foreign Language) in Indonesia. From the four language skills; listening, speaking, reading, and writing, speaking has important role as one of indicators so people can said as language master. The main goal of learning a language is for communication. Burnkart (cited in Nazara, 2011) stated, “They argue that speaking is the most important language skills that need to be controlled, and they assess learning achievement based on mastery of speaking skills. It is also supported by Harmer (2007a),”The conversation that take place when we buy a newspaper at a news kiosk is interactive, whereas leaving a message on an answer phone is non- interactive” (p.343). Harmer divides two types of conversation; interactive, in which we have partner to talk to, and non- interactive, which is vice- versa. Those types of communications are the form of language output; speaking. That is why, researcher said about the goal of learning a language is for communication.

## 2.2 Speaking Problems

An advance language learner could produce a good communicative language with all the culture in it, but it cannot be avoid that cross- cultural understanding takes roles; EFL students tend to make errors. Errors are common things which appear in learning process. “In oral interactions, if the main aim is to communicate, then errors mustn’t be corrected exhaustively, otherwise the communication flow will be broken” (Iseni, 2013, p.64). There are some problems faced by the learners in speaking activities. As mentioned by Beddebah (n.d.) that problems

include student inhibition, nothing to say, the low of participation, the theme to be spoken, and the use of mother tongue. These are the other factors which come from students itself. Moreover, CatherinePR (2013) also add that they (students) feel silly speaking a language in which they know they are making mistakes. It is in line with fear of derision as proposed by Syam (2009). These kinds of problems make students get difficulties in developing their abilities.

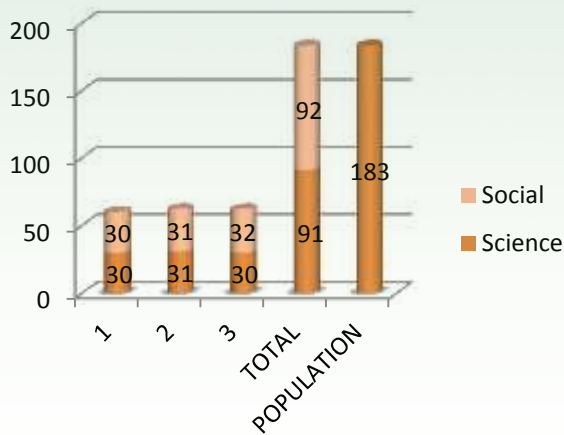
Syam (2009) confirmed that seven psychological studies that have been proposed by Tsui are also became problems for the students in MAN Riau. Juhana (2012) did explore more deep about it. She did a qualitative study and employed some instrument to understand more why and what are the each factors’ definitions based own the sample elaboration. It was gained by using open- ended questionnaire and also interview.

To synthesize, this partial section explains theories related to psychological problems which cause problems in speaking English as foreign language. Besides, there are some previous studies also discuss about the problems in speaking skill. The previous research study investigating factors that hinders students from speaking in English class reported that those psychological factors mostly same and were agreed with the theories portrayed in this study. As the Students’ psychological problems in speaking English influence their academic life, the reports shows it relationship to students’ self- confidence.

## 3 METHODOLOGY

This present study was designed to seek the most common students’ psychological problems in speaking English in one of senior high school in Bandung. Creswell (2009, p.145) explains that a survey design provides a quantitative or numeric description of trends, attitudes, or opinions of population by studying a sample of that population. Hence, survey research design aims to discover the attitudes and/ or opinions, this present study employed it to discover the answer of the research question. The population of this study is all the eleventh grade students of a senior high school in Bandung. There are six classes of eleventh grade. They are divided into three science classes and three social classes with total number 183 students. The chart below will describe it:

Chart 1. The Population of the Study



According to observation before conducting this research, it is found that there is no difference in English material that is given by English teachers there. Either science classes or social classes use the same English materials. This school also has special class for speaking, namely conversation class. It is held two days a week for around 1.5 hours. To choose which students of each class that will be the representative of each grade, researcher did random sampling technique. Tuckman (1978, p.226) stated that one way to insure that this sample will be representative of the larger population is to draw a random sample because random selection limits the probability that you choose a biased sample. The sample was taken from all the six classes of eleventh graders. Each class was taken 16 to 17 students randomly, so the sample was 100 students.

The data in this study were collected by using questionnaire. It is consisting of seven close-ended questions of possibility causes of their problem in speaking class based on psychological factors as proposed by Syam (2009). According to Tuckman (1978, p.196) that questionnaires and interviews are used by researchers to convert into data the information directly given by a person (subject). In line with Creswell (2005, p.360) who states that questionnaire is a form used in a survey design that participants in a study complete and return to the researcher. In this study, the questionnaire which was being used is a ready-made one. It was taken from previous related study by Syam (2009) in which the reliability and validity were confirmed.

### 3.1 Data Collection Procedure

At the very first time, reading literature reviews and related it to the burning issues were the first step to be taken. In daily activities, it is found that students tend to be reluctant whenever being asked to speak English. That is why, problems in speaking English

as EFL learners is chosen as a topic for this research, looking at some literature reviews; all previous studies that are related to her topic; speaking problems. There are some studies, so it is used to made a literature map to help in focus on certain aspects; psychological factors. When the object had decided for this present study (by considering the time, the access, and other possibilities in conducting the study), hypothesis and the research questions were conducted, and then the operational definition of terms in this study were explained briefly to make limit on it, so that the reader of this study would understand it clearly. Soon after having the prior knowledge of what would to do in this study (conducting instrument, etc.), sampling and data collection were collected. The respondents were asked about their opinion on what psychological problems they face in speaking English by using close-ended (Likert-scale) questionnaire that were formulated in Bahasa Indonesia. And then, the data were analyzed and discussed briefly. The research question could be answered based on analysis of the responses that were given by the sample through questionnaire; conclusion of the study were formulated and the result of the study were reported. The data also being used to give suggestions to the EFL teachers of how they create; build; choose materials in speaking English Class by considering students' needs in order to overcome their problems, which could contribute to their improvement later on.

### 3.2 Data analysis

The data were collected by using close-ended questionnaire and analyzed descriptively.

According to the questionnaire that had been distributed to 100 students as the sample, the researcher gave questionnaire which was consisting of seven items involving: *students' anxiety to speak English in the classroom, students' fear of making mistake, students' fear of derision, teacher's intolerance of silence, uneven allocation of turns, student's low proficiency in English, and incomprehensible input*. Looking at the percentage of each psychological factor that might happen or feel by senior high school students, we can describe that each psychological factor become cause of the speaking problems.

Item 1 is about student's anxiety to speak English in the classroom. From the result of questionnaire, we had information that there were only 38 students (38%) who said agree that anxiety become the cause of their speaking problems while 62 students (62%) did not really think that it is a big matter. It implies that only few of them struggle in that psychological factor as the cause of their speaking problems.

Item 2 is about student's fear of making mistake. 45 students or 45% from the whole sample agreed that this is one of psychological factors that cause



their problems in speaking English in the classroom and 55 students (55%) did not agree with that. This factor also influence their speaking skill; they believed that this factor cause problems in speaking but it was not all of them agree; it was even not half from the total sample who agreed.

Item 3 is about student's fear of derision. There are 76 students or 76% of the sample agreed to this statement. They agreed that this psychological factor is one of the causes of their speaking problems. 24% or 24 students did not agree with this statement; they did not think that it could influence them much so could cause their problems in speaking.

Item 4 is about teacher's intolerance of silence: 47% of the sample agreed but 53% of them did not agree. It was not even a half but we could not deny that it is also taking role in causing speaking problems

Item 5 is about uneven allocation of turns 66 students believed that this factor is one of the cause of their speaking problems. More than a half of the sample said that it was a big matter while actually there were also 34 students did not agree with it.

Item 6 is about student's low proficiency in English. 56 students or 56% of them realized that they do have low proficiency in English and it was a reason of the problems they faced. But 44 students or 44% of the total sample did not really think that their weakness was the cause of their speaking problems.

And Item 7 as the last psychological factor is about incomprehensible input: 62 students agreed to the statement about it. These 62% sample believed that actually they could understand and gave response to their teacher well. While in other hands, 38 students did not agree to this.

#### 4 FINDINGS AND DISCUSSION

As describe in data analysis before that each psychological factors, which are proposed in a study by Syam(2009) and being adopted in this study, became the senior high school students' cause in speaking problems.

Based on the research question number one, about the number of students who are having psychological factors which causing their problems in speaking, the researcher could inform that there are 10 students said strongly agree and 28 students said agree. In this case, the researcher tried to explain to the readers that whether strongly agree or agree is inferred as the same expression: agree and whether disagree or totally disagree is inferred as: disagree. So, from *students' anxiety to speak English in the classroom*, there are 38 students who were agreed and 62 students were disagreed. For *students' fear of making mistake*, there are 45 students agreed and 55 students did not. For *students' fear of derision*, there are 76 students agree and 24 students vise- versa. While in *teacher's intolerance of silence*, there are only 47 students agreed about it while the other 53

students did not. For *uneven allocation of turns*, students also had high agreement about it; there are 66 students and 34 students were in vise- versa. *Student's low proficiency in English* is not really the big matter in causing speaking problems. There are 56 students agreed that language proficiency was the good reason of their speaking problems, and *incomprehensible input* become other big factors. 62 students agreed about it and 38 students did not.

While in order to answer research question number 2, the data from questionnaire has answer it. The most common psychological factors that are causing students' speaking problems are (1) fair of derision, (2) uneven allocation of turn, (3) incomprehensible input and (4) low proficiency in English. These four psychological factors became the top four of the most common factors that were faced by students.

The data that had been gained through questionnaire showed us that every student had speaking problems which were causing by the seven psychological factors. But those factors were not belong to every of them. It can be interpreted that some of them felt that *fair of making mistake*, *anxiety*, and *teacher's tolerance of silence* are not the main factors which can cause speaking problems to them. So, actually the students have internal motives in learning a language: They do understand about the goal of learning a language: to be able to use it in communication: to speak! Looking at their responses to the questions about three psychological factors above (anxiety; fair of making mistake; and teacher's tolerance of silence), senior high school students nowadays have more motivation to speak. They are not feeling reluctant to speak. It is contrast to Horwitz (1991) as cited in Sylvia and Tiono (2004). He believes that anxiety about speaking a certain language can affect students' performance. It can influence the quality of oral language production and make individuals appear less fluent than they really are.

While some of the students felt that some psychological factors (that become the common factors; fair of derision, uneven allocation of turn, incomprehensible input, and low proficiency in English) are the big matters so that they are having problems in speaking. Based on these data, the researcher could infer that actually students need more encouragements from the teacher. They need more time, they want

#### 5 CONCLUSIONS AND RECOMMENDATIONS

##### 5.1 Conclusion

Psychological factors can affect students' performance in speaking. Since English is very different to students' first and second language, the problems are not only from linguistics matters but also more from themselves; psychological

problems—their attitudes towards the teaching learning of the language. Moreover when teachers do not pay attention on it, the students will struggle and suffer because of being ignored. Uneven time allocation that is given by the teachers also can make them worried. Meanwhile, the classroom environment which is not handled well cause fear of derision. Knowing these problems will help teachers aware of the classroom atmosphere and more understand of the students’ feelings; create a safe and fun classroom session. So that, everybody could get involve in speaking practice.

## 5.2 Recommendations

Based on the findings in this study, it is suggested to the EFL teacher to focus on the learning goals by considering the most psychological factors which are causing problems in speaking. These findings can help teachers focus on creating suitable materials to overcome the problems and even providing activities by considering their feeling toward speaking class.

The researcher also recommends other researchers who want to conduct typical study, to have more literature review before doing it. Since speaking skill is a common topic in EFL studies. It is important to know what will we do; what are we doing; and what have we done. So, we can keep focus on what we are trying to investigate in our study.

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## The Effect of Implementation Lesson Study At Environment Science Course

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**Abstract:** The Learning process in collage is limited on memorizing level, the process is less emphasized on higher cognitive level such as analysis and evaluation skill, creative thinking, learning independency, and other affective aspect. This is one of factor of student being passive. Often times, the knowledge they got is less useful and didn't to emphasize of high cognitive level, as durability to analysis skill, to evaluation, to development of creative thinking skill, to learning independence, and to development affective level. That is causes one of student passive and obtained knowledge oftentimes not usefully in their life and the work. One of alternative to increase the learning quality in college is by implementing Lesson Study. For student, some benefits can be achieved through Lesson Study. Those are (1) students will reach several individual quality that influences their learning called attitude and intelligence thinking (the habits of mind and heart that fundamental acre to success indium school), (2) the learning community is built between lecturer and lecturer, students and students, lecturer and students with lecturer in collage, and (3) the students learning ability is increased especially in the aspect of high cognitive process and affective aspect. This research was focusedto gathering the data about the effect of implementation lesson study at Environmental science. The subject is students of biology involved at lesson study program in STKIP Hamzanwadi Selong in the academic year 2012. The instrument research is questions about the student experience in joining lesson study during learning process at Environmental science subject matter). The Result of analysis shown that students “yes” answer in each item: (1) cooperation;100%, (2) Discussion with friends; 95%, (3) new learning experience; 86%, (4) Communication; 81%, (5) thinking skills; 76,2%, (6) Learning method;76%, (7) Learning independence; 67%, and (8) Discussion with lecturer; 61%. Based on data analysis, it's concluded that students have changed in some aspects after they learn through lesson study.

**Keywords:** Implementation, Lesson Study, Environmental science

### 1. BACKGROUND

The education is a conscious and deliberate effort to make a situation and learning process that learners actively develop their potential to have a strength of spiritual, self-control, personality, intelligence, morals character, and skills needed, society, nation and state (UU Sisdiknas, 2003, Pasal 1 ayat 1). The system of lecturer active learning, can be low effectiveness and can not grow and develop active participation in the learning process (Dikti, 2008). According Dewey (Joyce, et al., 2000), the core of the learning process is setting an environment where learners interact on learning and how to learn. Rutherford & Ahlgren (1990) stated the process of learning science, mathematics, and technology should take place effectively. Effective learning is meant

students learn to construct their own knowledge, learning through direct experience in concrete, as well as the students learn with problem solving through team work.

Many factors supporting to success of educative participant in learning, besides internal factors from educative participant also there are external factors such as teacher, facility of learning, and environment learning. Teachers has important role to success of learners between it is assisting in process understanding through a variety learning media, so that learners would construct their knowledge by self. The problem was often encountered by teachers in the learning process be sides a lack of used the method and instructional media is arrange teaching plan and teaching material, and evaluation. Planning,

implementation and reflection in the teaching and learning processes are rarely done continuously, collegiality and accountability. This is caused generally teachers prefer to work alone in preparing and do it at courses, so professionalism decrease to developed.

Therefore, needed a activities to analysis learning and professional development teachers to improve effectiveness learning, one of is through lesson study. Lesson Study is a model of professional development education through assessment collaborative learning and continuously, based on the principles of collegiality that help in learning to build a learning community. The implementing Lesson Study in learning will be able give opportunities for teachers and lecturers to learning how to learn and learn about teaching. Lesson Study was conducted in three stage namely Plan, Do, and See the cyclical implemented and sustained. The research question is "whether the Lesson Study given impact toward the learning process at environmental science courses?".

## 2. METHOD

This research used descriptive statistics that is to describe an overview the research object through the sample data or population without do the analysis and making a conclusions are general (Sugiyono, 2011). The procedure is give the students a questionnaire containing several questions related with learning experience students through lesson study. The questionnaire distributed to students in semesters 2 involved in lesson study 2012 of the years, amounting student is 21 person. The form of questions is.

Instrumen Literasi	
1	Class
2	Subject
3	Activity
4	Ability

Instruction: Fill the instrumentas according to real situation.

No	Question	Answer
1	Are you feeling anxious to cooperate as a group of learning?	
2	Do you feel tired on the discussion with other students about the system materials?	
3	Are you obtain new learning experience in learning?	
4	Are you feeling things in learning as a type of learning?	
5	Are you feeling things in thinking, self's, and impact of learning?	
6	Are you feel study change about the system?	
7	Are you feeling things in learning as a type of learning, cooperation?	
8	Are you feel self's discussion with the material learning materials?	

## 3. RESULT AND DISCUSSION

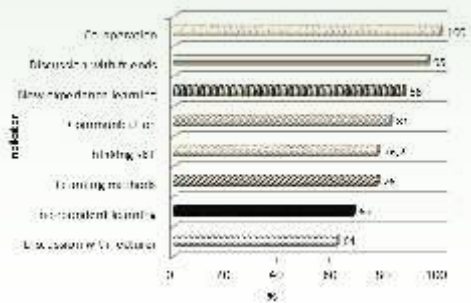
A Teaching skills teacher will determines success of learning process in the classroom to transferring their knowledge, skills, attitudes, and values to students in learning process and is a part of pedagogic competence that must be have other than personal competence, social, and professional.

Rustaman, et.,al (2003) stated in the education system cannot be suspected that teacher is one of component system occupying a central position. Whatever good of educational program developed by the experts, but teachers can't execute their job, hence the implementation and results of learning can digress from purpose. In order not to digress from purpose, the teacher must have four competence which has stated in Permendiknas R.I Nomor 16 Tahun 2007 about the Academic Qualification Standards and Competencies Teachers is expressing that there are four main interests of which must be owned by teacher, that is pedagogic competence, personality competence, social competence, and professional competence.

The four competences mentioned will be appearing in learning process. At pedagogic competence; one of ability must be done by teacher is design and executes learning that is design of learning strategies, worksheet activity, and assessment. Personality competence; a teacher in stable condition in the class room during convey a content of Lesson. Social competence; the ability in communicating and interacting especially way of communicating with student during learning process. Professional competence; the ability to comprehend concept exhaustively.

At the time of implementation lesson study, activity designs learning by lecturer was done in collaborative with their team, done some revisions before executing lesson. In the class, occur active communications between lecturers and student, student and student, and discussion runs at smooth. Based on results of questionnaire analysis showed that (1) lecturer; collegiality between lecturer and students are good, two-way communication has actively be done, has using a variety learning strategies that trained higher order thinking skills for students. (2) students; cooperation was intense at inside and outside

classroom, and students are habitual to high-level thinking. Here are presented the results of questionnaires to students had experienced lesson study (see graphic 1).



Graphic 1. Increase learning process through Lesson Study

The implementation of lesson study in STKIP Hamzanwadi Selong especially in biology education study program gives a good impact at environmental science course was done during one semester. Some benefits of lesson study obtained that is: (1) collegiality between students and lecturer has been formed, (2) there are bravery suggesting opinions and crosswise opinion between students, (3) composing a lesson plan it's systematically, (4) using and developing learning strategy having of constructivist to train ability high level thinking skills of student, active and creative.

Lewis (Santayasa, 2009) stated, there is eight obtainable opportunities by teacher if teacher implementation lesson study continuously that is (1) thought of carefully about the direction of learning, content, and field study., (2) analyzing and developing best lesson can be developed., (3) deepens of knowledge about content lesson, (4) thought of exhaustively purpose long-range which will be reached by student, (5) designs lesson in collaboratively, (6) studies carefully of ways, learning process and behavior student, (7) developing of pedagogic knowledge, and (8) observe of result lesson by self through student and college.

Lesson Study can give opportunity for teacher to develop pedagogic knowledge in an optimal fashion. This thing is caused by through Lesson Study; teacher continually copes to develop and increases applicable

study strategy to interpret the curriculum. Teacher earns continually thought of how quality question capable to solve by student in learning. That question expected to motivate student to maintain enthusiasm learning consistently. Teacher also thought of how using debate that be able to maximize participation student in discussion and how pushing student to make good notes and does reflection by self (Santayasa, 2009).

#### 4. CONCLUSION

The implementation of lesson study gives a good impact, including: (1) creation collegiality among lecturer and lecturer, and lecturer and students, (2) two-way communication active be done, (3) use a variety of strategies learning, (4) the establishment of learning community among students, (5) increasing willingness of learners, (6) collaboration among students exists outside and inside the classroom, and (7) students habitual to high-level thinking.

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## The Use of Traditional Games For Building Young Learners' Cooperative Skill

*(An experimental research on the fifth grade students of SD Negeri Kudaile 04 of Tegal Regency)*

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**Abstract** The problems of education in Indonesia dealing with young learners' character building and the urgent needs to preserve traditional games as parts of the nation's cultural heritage become the background of this research. There are a number of principal characteristics as parts of children's character building, such as respect and cooperation. They could be implicitly taught to children by using traditional games which basically contain moral values. This is a descriptive quantitative research conducted to describe the use of traditional games of Tegal as learning techniques for training young learners' cooperative skill. This paper also reveals the actual use of traditional games for teaching English. The games used in this research are *tempolong/boi-boian*, *gobak sodor*, *bentengan* and *remidon*. This experimental research is conducted at thirty-eight fifth graders of SD Negeri Kudaile 04 of Tegal Regency. The data is collected by conducting observation on the students playing each game and giving questionnaire about the games. The result shows that the use of traditional games as learning techniques is a meaningful way of teaching young learners as well as an effective way of preserving Indonesian culture and traditional values. Team games such as *tempolong* and *gobak sodor* are effective for training and testing learners' cooperative skill. Materials of school subjects like English could be integrated in the games to optimize the learning process. However, the games should be modified and the learning materials should be integrated in such a way that it would not be too complicated for young learners.

**Keywords:** traditional games, young learners, character building, cooperative skill

### 1 INTRODUCTION

Tegal is a small town located at the north coast of the Central Java Province of Indonesia. It is a four-hour ride from Semarang, the capital city of the province, and a six-hour ride from Bandung. The distance from the nearest big cities makes it culturally different from them. While many people living in big cities tend to have modern lifestyle, the people of Tegal are still in the transition from natural and traditional way of life to the modern one. It somehow affects to their unpreparedness of the modernity that they sometimes ignore the moral and cultural values simply because of the thought that they are old-fashioned.

This condition also influences the characteristics of the people and the process of education there. Despite the fact that there are commonly extracurricular activities at schools, many of them focus the learning processes only on the academic field. One of the likely reasons is that they have the urge to prepare the students to compete with those from big cities who have easier access to technology. As a result, the character building starts to be forgotten, and many values born by the Javanese tradition such as respect, care, and cooperation are eroded.

In the meantime, character building is one of the foci of the current Curriculum 2013. It means that learning activities are not supposed to stress only on

the students' cognitive skill development. The affective and psychomotor skills should also be developed. In other words, teachers need to find new teaching techniques and strategies involving students' character building.

One of the ways of building students' characters is by using traditional games as learning techniques. As a country famous for its rich culture, Indonesia has numerous traditional games. Some games are even familiar in many parts of the country, even though the people name them differently. By doing this, it is not only that students' characters are built, but also that the traditional values and cultures are preserved. This is important since the games start to be forgotten as children prefer playing with their gadgets to having physical activities outside.

Besides, traditional games are *explorable* and modifiable so they could be used for teaching any subjects such as English or math at school, especially for young learners. Teaching young learners is different from teaching teenagers or adults since they each have different needs and basic characteristics. Young learners learn best when they do something they enjoy doing, and playing games are among the most interesting activities for them. By applying meaningful learning principle, their cognitive, affective, as well as psychomotor skills are most likely to be developed.

This paper discusses how the application of traditional games affects effectively to young

learners' cooperative skill as one of the good characters to build. It also gives some ideas of how the games are actually used for teaching a subject – in this case is English. This paper focuses on four traditional games popular in Tegal – though some of them are not originally from the region – namely *rok gebuk/tempolong/boi-boian*, *gobak sodor/main ladang*, *bentengan*, and *remidon/rok pimpet*.

## 2 TEACHING YOUNG LEARNERS

Children basically have different characteristics with teenagers or adults. Harmer (2003) classifies the ways young learners learn a subject as follows:

- a. Upon learning a foreign language, they respond to the messages even without knowing the lexical meanings;
- b. Young learners learn by absorbing information from all sides and learning everything around them, not just the specific thing being taught;
- c. Their understanding does not come only from teacher's explanation but also from what they see, hear, and feel;
- d. They are generally enthusiastic in learning;
- e. They need the teacher's special attention and approval;
- f. They respond well to activities involving their life as the topic of discussion; and
- g. They get bored so easily.

It is obvious then that to teach young learners, a teacher needs to apply at least three main principles; they are implicit learning, meaningful learning, fun activities, as well as considering children's *short attention span* (Harmer, 2012:258). For that, Shin (2006:6-7) proposes several ideas to teach young learners:

- a. Involve the use visual media, *realia*, and movements in classroom activities;
- b. Involve them in the process of making the media and *realia*;
- c. Prepare a few other activity plans as an anticipation of their nature of not being able to concentrate on one thing for more than 15 minutes;
- d. Employ thematic learning;
- e. Use familiar stories and contexts;

By making sure that the learning activities are adjusted to the young learners' characteristics, their interest and involvement could be maximized. When they do a learning activity happily, the effectiveness could be optimized. In other words, the success of a learning is in the hands of the teachers', especially on their ability to understand the learners' characteristics and design the suitable activities for the lesson.

Therefore, a meaningful, applicable, and interesting lesson and material for children is needed. Meaningful here means that both the

technique and material could be connected with their real life, so it would be easier for them to get interested in it. Jonassen in Keskitallo (2011:19) states that a learning process is meaningful when it is correlated with things young learners could find in their life. By doing so, they would learn things they need in life. Applicable here means that the materials should be something students could apply in real communication. At last, interesting means that the learning method should be varied, suitable for children, and something that could raise their motivation.

## 3 CHARACTER BUILDING (COOPERATIVE SKILL)

Solomon *et al.* (2006:4-5) indicates twelve pillars of universal characteristics. They are goal setting, self-awareness, appreciation of achievement, value on others, self-control, caring, being responsible, nationalism, lifelong learning, self-confidence, respect, and trustworthiness. Those twelve pillars are the ones to be worked out by the learners. Having these characteristics, someone would be an excellent member of the society who is likely to gain success. Therefore, character building is obviously a crucial thing to be integrated in lessons.

Wijaya (2009:2) quotes the theory of Multiple Intelligence (Gardner, 1983) by pointing out that one of human intelligences is interpersonal intelligence. It deals with someone's ability to cooperate with others. It is the competence to communicate effectively in a social interaction. This intelligence contributes to their social life in many ways which may add to their success. Thus, the ability to cooperate is one of the characters to be built as early as possible. One of the ways is by using games as learning techniques. As Soeparno in Djuanda (2007:19) states, the use of games as learning techniques could be used for teaching cooperation and solidarity. In other words, of all the characteristics to be built in young learners, cooperative skill is one of the most significant since it would affect to their social attitude in the classroom leading to their success of learning.

## 4 TRADITIONAL GAMES AS LEARNING TECHNIQUES

Based on the principle of meaningful learning, the materials and activities in a lesson would be best understood and participated well by the students if they are integrated into something familiar for the learners. One of the ways is by integrating games into the lesson. According to Buhler in Djuanda (2007:14), playing triggers creativity. It is a good trick of changing and optimizing children's

potentials. Djuanda (2007:15-16) even argues that a learning process which involves games is very effective to convey abstract concepts.

Furthermore, Tedjasaputra in Iswinarti (2010:7) finds that playing has functions and values in many aspects, such as physical, psychomotor, social, emotional, characteristic, and cognitive developments, sensory perception, as well as soft and hard skill training. It is obviously proven that playing games is an effective way of learning especially for young learners. There are many advantages of applying games as learning techniques (Soeparno in Djuanda, 2007:19); those are: (a) it could increase students active participation in the learning process; (b) it could involve not only their physical but also psychological aspects; (c) it could improve students' learning motivation; (d) it could be used for teaching solidarity and cooperation (character building); and (e) by integrating the materials into games, children could keep the memory of it much longer.

Many evidences show that games optimize the learning process. Froebel in Sugianto (1997) believes that games are among the best tools to educate children. They would be willing to participate in a learning activity not because they have to, but because they fond of it. They also tend to pay more attention to the lesson as they enjoy the activities and in turn try harder and feel better about themselves (Vernon, 2009). While participating, children will have more reason to communicate, and it leads to their eagerness and willingness to learn more, as well as train their ability to cooperate.

Meanwhile, the focus of this paper is on the use of traditional games. Ariani in Susanti (2010) reports the value implied in the games, namely pleasure, democracy, responsibility, obedience, and cooperation. Many traditional games teach honesty, tolerance, creativity, as well as other positive values worthy of the social life of a nation. It all explains that traditional games are perfect tools for building young learners' characters.

The games used in this research are *rok gebuk/tempolong/boi-boian*, *gobak sodor/main ladang*, *bentengan*, and *remidon/rok pimpet*. Most of them are team games and chosen here as they promote cooperation and because they are among the most popular in Tegal.

(1) *rok gebuk/tempolong/boi-boian* (hit and run)

This game could be played by unlimited number of players; a half of them become the runners and the others are the chasers. Before running, the runners should take turn in trying to hit the target (a pile of ceramic tile pieces) by using a tennis ball. If the target is hit, the runners have to run and the chasers have to try hitting them with the ball. While avoiding the chasers, all runners have to make up the target without leaving any

tiles behind. The runners win when they successfully make up the target before all the members are hit with the ball. Conversely, the chasers win when they have hit all the runners before they succeed in making up the target. The next round will go with the same position if the runners win, but they switch position if the chasers win.

(2) *gobak sodor/main ladang/galah asin* (go back through the door)

It could be played by six to ten people who are divided into two groups; the guards and the runners. The essence of this game is that the runners have to go through the arena by escaping the guards who stand in different lines. The guards have to prevent the runners from getting to the back side of the arena and coming back to the front side. If one of the runners happen to be touched by a guard, the game is over and the groups must switch positions for the next round. However, if a runner makes it back to the front side of the arena, the game starts over with the same position.

(3) *bentengan* (fortress)

The two group playing this game need a tree or pole each to be their fortresses. Their job is to guard it and prevent the other group to conquer it simply by touching it. If a player of a group happens to be caught by the other group, the teammates must free him while trying not to get caught. The more hostages a group has, the more likely they are to win the game. Cooperation is very crucial here. Each of the players should be able to play different roles in order to win. Some of the shared roles are to be the attacker, spy, deceiver, savior and fortress guard. This game teaches children to make plans and strategies to win as well as testing their running speed.

(4) *Remidon/rok pimpet* (Blindman's buff)

A player of this game has to be the seekers while others have to escape him. The seeker's eyes are covered by using a scarf, and he has to fumble around to catch any of the other players. When he touches someone, he has to guess who that person is. If answer is correct, the person becomes the next seeker. If it is incorrect, he has to let the person go and try to catch someone else. All the other players are not allowed to move anywhere until a new seeker is chosen.

In order to match with the nature of each school subject and the learning materials, the procedures of each game need to be modified. Some components and tools of the games might also be added. Also, the materials being taught must be integrated in the procedures since the games are used as learning techniques. The modifications should be set in such a way that young learners would not find them difficult to do.



As it is pointed out before, this paper proposes an idea of using traditional games as English learning techniques. Language could be well taught by using games. As Mayarina (1999) argues, activities of playing games are sorts of a language laboratory. It is because while playing, children would communicate with each other, training their verbal competence. Therefore, English is perfect to be an example of subject to be taught by using the traditional games.

## 5 METHODOLOGY

This is a descriptive quantitative research conducted to describe the use of traditional games of Tegal for training young learners' ability to cooperate with each other. The traditional games (*rok gebuk/tempolong/boi-boian*, *gobak sodor/main ladang*, *bentengan* and *remidon/rok pimpet*) are specifically used for teaching English for young learners. The English materials are integrated in the instructions of the games.

This experimental research uses one-group design, conducted at thirty-eight students of the fifth grade of SD Negeri Kudaile 04 of Tegal Regency. The school is located at the suburban area of Tegal Regency. It is about fifteen kilometers away from the business center. All of the students of this school live near the school in the same neighborhood, so they have quite similar cultural and social background. Something to notice here is that they are still familiar with a number of traditional games, unlike those living in the inner-town areas. Therefore, it is not so hard to introduce them with the games.

This research is carried out by applying the traditional games as English learning techniques. The integration of materials of a school subject here is to optimize the role of the games, not only to focus on the young learners' character building but also on the cognitive ability. The application of the techniques is made as close as possible to the real classroom context.

The data is collected by doing direct observation and giving questionnaire about the procedures of the games. The direct observation is used to actually see how young learners cooperate with each other in each of the games. The questionnaire covers ten questions about the procedures of the games, learners' perception on the games and the effects on their English learning. Those techniques are used to find out the children's responses on the games and the effects on their cooperative skill. The last part of the questionnaire is to make sure that the modifications of the traditional games and the integration of school subjects' materials are doable and understandable. The result

of the observation is analyzed descriptively, and the questionnaire is analyzed statistically.

## 6 DATA ANALYSIS AND DISCUSSION

### 6.1 Data analysis

#### 6.1.1 Observation

Before playing the games outside, a classroom activity is carried out to prepare the young learners with the English expressions and to explain how to play the games. The procedures of each game are as follows:

- (1) *rok gebuk/tempolong/boi-boian*
  - (a) Every time a runner is about to throw the ball, he says, "I can do it."
  - (b) After the runner says, "I can do it," the chaser replies, "I'll catch it."
  - (c) When the target is hit, the runner says, "I did it! Run, everyone!"
  - (d) In the chase, every time a chaser is about to throw the ball, he says an English expression depending on the material being learnt.
  - (e) When a runner gets hit, the chaser says another English expression depending on the material being learnt.
  - (f) When he fails hitting the runner with the ball, another English expression is spoken.
  - (g) When the target is successfully rearranged, the runners say, "We did it! We won!" and the chasers say, "Better luck next time," and the game starts over with the same roles.
  - (h) When all the runners get hit before the target is rearranged, the chasers say, "We did it! We won!" and the runners say, "Better luck next time," and the game starts over with both groups switching roles.
- (2) *gobak sodor/main ladang*
  - (a) Before the game starts, when all the guards are on positions, every member of both groups introduces themselves by mentioning their names and roles.
  - (b) Other than the players in the arena, each team also has a player acting as guide who gives them instructions and warning in English.
  - (c) On the run to the back side of the arena and going back to the front, each runner should answer questions about the English materials being learnt from the guard.
  - (d) Upon failing, the particular runner should stay at the square where he is until he manages to answer the questions.
  - (e) When he could answer correctly, the next thing to do is to get through the guard by avoiding him so he could not reach him.

- (f) When a runner is touched, the game is over and both teams switch position.
- (g) When a runner makes it back to the front side of the arena, he says, “I’m home!” and his team wins. The game starts over in the same positions.
- (3) *bentengan*
- (a) A player who is trying to attack the opponents’ fortress says an English expression depending on the materials being learnt.
- (b) The player from the other group who is trying to catch the first player replies the English expression and shout, “I’ll catch you.”
- (c) When the first player is caught, the catcher says, “Come and get your friend.” The caught player then says to his teammates, “Save me, please.”
- (d) When the teammate makes it to save him from the opponents’ fortress, he says, “Run for your life!” to the one(s) he saves and “Come and get us!” to the opponents.
- (e) When a player makes it to touch the opponents’ fortress, he says “Conqueror! We did it!”
- (4) *remidon/rok pimpat*
- (a) Before the seeker gets his eyes covered, each of the other players wears a tag with a clue about some topics in English.
- (b) When the seeker makes it to catch a player, he has to read out the clue written on the tag he is wearing and the seeker has to mention the player’s name and guess the answer.
- (c) If the answer is correct, all other players say, “Yes, that’s right,” and the player who gets caught become the next seeker.
- (d) If the answer is incorrect, all other players say, “No, that’s wrong,” then the seeker lets the player go and try to catch another one.

### 6.1.2 Questionnaire

There are two parts of the questionnaire filled in by the students; the intercorrelation data and the interactional data. The intercorrelation data show the respondents’ personal data. Meanwhile, the interactional data show students’ perception on their usual English lesson, their understanding of the procedures of each game, and their opinion on how the games affect their English. Thirty-eight students filled in the questionnaire, and the results are calculated using simple statistics showing the frequency of the answers. The results are as follows:

- a. Tabulation of intercorrelation data

Table 1. Sex

Male		Female		Total	
15	39.5%	23	60.5%	38	100%

Note: There are more female than the male respondents.

Table 2. Age

Age	Number	
9 yrs. Old	0	0%
10 yrs. Old	21	55.3%
11 yrs. Old	16	42.1%
12 yrs. Old	1	2.6%
	38	100%

Note: Most of the respondents are in the age of 10 and 11.

Table 3. Native language(s)

Language	Number	
Indonesian	38	100%
Tegalan Javanese	32	84%
Sundanese	1	3%
Other language	0	0%
Monolingual	5	13%
Bilingual	33	87%

Note: All respondents speak Bahasa Indonesia, and most of them also speak Tegalan Javanese.

Table 4. Favorite subject(s)

Subject	Number	
Bahasa Indonesia	15	39%
English	12	32%
Javanese	4	11%
Other Subject	32	84%

Note: Most respondents choose other subjects than language as their favorite. However, more than 70% of them also like language subjects, though only 32% of them like English.

b. Tabulation of interactional data

Table 5. Tabulation of interactional data

No.	Question	Answer			
		A	B	C	D
1.	English lesson	38	0	0	0
2.	English games	1	1	21	15
3.	Favorite traditional game	4	26	2	6
4.	Procedures of <i>bentengan</i>	2	35	1	0
5.	Procedures of <i>remidon</i>	1	5	25	7
6.	Procedures of <i>tempolong</i>	0	37	1	0
7.	Procedures of <i>gobak sodor</i>	0	2	36	0
8.	Procedures of <i>gobak sodor</i>	0	23	15	0
9.	Traditional games for learning English	29	0	8	1
10.	Traditional games for learning English	27	3	8	0

Note: From the tabulation of the respondents' answers, it could be inferred that:

- (a) All respondents agree that the English lesson in their school is fun.
- (b) 55% of the respondents admit that their English teacher rarely uses games as teaching techniques. 39% others even state that she never uses any games.
- (c) 68% of the respondents prefer *tempolong* to other traditional games used in the research.
- (d) 92% of the respondents realize that teamwork is needed for winning the game of *bentengan*.
- (e) 66% of the respondents think that it is more important to avoid the seeker in *remidon* game than to help other players escape him.
- (f) 97% of the respondents think that for winning the game, guards in *tempolong* game need to cooperate by throwing the tennis ball to each other so they could hit the runners with the ball.
- (g) 95% of the respondents agree that teamwork is needed for winning a *gobak sodor* game.
- (h) 61% of the respondents agree to focus on preventing the runners from getting through them when they become the guards without bothering to care about the other guards. Meanwhile, 39% of them think that any movement a guard makes, it should conform to the other guards'.
- (i) 76% of the respondents think that the use of traditional games as learning techniques has positive effects on their English vocabulary achievement. However, 21% of them think that the games only have a little effect on their English.
- (j) 71% of the respondents admit that the use of traditional games as learning techniques makes

English easier to learn. However, 21% of them think that the games only make the subject a little easier, and 8% of them even think that they do not make it easier to learn.

## 6.2 Discussion

Based on the observation and the questionnaire analysis, it is obvious that young learners enjoy playing games so much. They think that to use games as learning technique is a preferable way to learn English in a more fun way. The fact that their real English teacher never (or rarely) uses games for classroom activities makes them very enthusiastic in doing every single activity in this research. It could be seen from their lively spirit while playing the games, despite the fact that the class is held in the heat of the afternoon.

Later on, out of all the games used in this research, most respondents choose *tempolong* as their favorite. This is in accordance with their actual response to the activity. To play *tempolong* games for several rounds is fine for them. They also show good teamwork in every round. It is even hard to get them back to the classroom as most of them still wish to play. Compared to the other games, the amount of time they spend playing this game is the longest. This is also proven by the homeroom teacher who reports that after the research the young learners play this game almost every recess.

On the contrary, they show a different attitude toward *bentengan* game. In spite of their answer saying that teamwork is needed to win it, the observation shows that most players do not really cooperate with each other here. From eight to ten students in a group, there are only two or three of them really make the move to take the opponents' fortress. The rest prefer to stay at their own fortress doing nothing. This condition makes the activity ineffective not only for the character building, but also for the English learning. Because many of them do not make any movements, no English expression is practiced then. As a result, some active players complain on the others' passiveness and the game ends very soon since they lose the spirit to play.

Meanwhile, the teamwork expected to show in *remidon* game is also not satisfactory. As it could be seen from the questionnaire, for most players it is more important to avoid the seeker than to help other players escape him. Only 18% of them realize the importance of cooperation here. It is possibly because it is originally an individual game so it is somehow problematic to modify it into a team game. However, the English learning process here is seen quite effective.

Furthermore, in a question about *gobak sodor* most respondents choose the answer saying that

runners should cooperate with each other to outwit the guards so they could get through them. Yet, the observation shows that most of them focus only on avoiding the guards' touch without being aware of the teammates' positions. In other words, the teamwork here does not really show strategically. Practically, most of them take advantage of the moment when a guard is busy with a runner to sneak in through him, and it is not really teamwork.

On the other hand, a different attitude is shown when they become the guards. Even though most of the respondents choose the answer saying that they have to move on the line to keep the runners out – which does not really show the teamwork – the observation shows something different. While watching over a runner, they shout at the other guards asking them to secure the other parts of the arena. It is in accordance with 39% of them who believe that any movement a guard makes, it should conform to the other guards'.

Comparing the results of the observation and the questionnaire analysis, it could be seen that some of the respondents' answers are still biased. In some questions, while they know the ideal choices, they do not really act them out in the real games. It could be due to their preference of the traditional games. When it is the favorite, they tend to show high enthusiasm in playing it. In contrast, when it is not the one preferred by most of them, those who are basically passive learners do not bother helping the others win the game.

Besides, the varied response shown by the young learners might also be caused by the complication of the English material integration. In addition to the original procedures of the games, some specific expressions as well as other materials of English are included in them. It seems that some students find it difficult to memorize every expression they have to say while playing. As a result, some of them choose to be passive, especially in *bentengan* game. As to other games, that the players must say some words before making any movement also causes problems. For example in *tempolong*, a chaser is not allowed to throw the ball before saying a specific expression. Unfortunately, he forgets what it is and takes some time to recall it. When he finally says it and about to throw the ball, the runner he is after has gone. It makes the pace of the game feels somewhat slow.

Noticing the problems found in the application of the traditional games as learning techniques, some considerations should be made. They are as follows:

(1) *Remidon* could not be used effectively for training as well as testing young learners' cooperative skill since it is originally an individual game which is difficult to modify into a team game.

- (2) The other three games are proven to be effective in training and testing young learners' cooperative skill.
- (3) *Bentengan* is difficult to apply as a learning technique because many players tend to be passive and unmotivated to attack the opponents' fortress.
- (4) *Gobak sodor* and *tempolong* are the most suitable traditional games for building cooperative skill compared to the other two games.
- (5) Too many English expressions and instructions involved in the games make it difficult for the players to remember them. Therefore, the procedures of each game should be revised as not to involve too many additional instructions.
- (6) The procedures of the games also need to be restored to the original ones to make it easier for the players to follow. Instead of involving many additional English instructions, additional tools such as tags are more preferable to use since they could help the players to give clue of what they need to say.

## 7 CONCLUSION

Based on the results of the research, it could be concluded that traditional games, namely *rok gebuk/tempolong/boi-boian*, *gobak sodor/main ladang*, *bentengan* and *remidon/rok pimpet* could be used as learning techniques. This way, Indonesian culture and traditional values are preserved as they are being integrated in education. The effectiveness of the learning process could also be maximized since it is designed to be meaningful for learners. Playing is the nature of young learners. Thus, learners would be more motivated when a game is included in a lesson because they are doing what they like.

In order to optimize the effects of the traditional games as learning techniques, some modifications of the procedures should be made to meet the learning needs. The specific materials to be learnt should also be integrated in the games. As to learning English, some English expression should be included in the instructions of the game. However, teachers should also make sure that the modifications and the integration of the materials would not be complicated for the young learners. Thus, a thorough consideration and possibly a trial-and-error process are needed before actually applying the technique for teaching.

At last, some traditional games could be used for building young learners' characters. Even so, for training and testing their specifically cooperative skill team games such as *rok gebuk/tempolong/boi-boian*, and *gobak sodor/main ladang* are preferable. It is because those games require teamwork and

awareness from each player that they cannot win the game alone. By modifying the games in such a way, the mission of building young learners' good character as well as effectively shaping their academic skills could be accomplished.

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## A Case Study : Training of Women and Children for Ownership of Their Rights

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Abstract :

Keywords : Childrens` Rights, Womens` Rights, Domestic Violence, Secularism

### 1. INTRODUCTION

A problem statement on this paper is that the paper reports on a project that aimed to raise the awareness of students about children-women rights via having them shoot a short film.

#### Purpose of the Study

Atatürk, the founder of the Turkish Republic, was a revolutionary thinker and a thorough reformist who made sure that Turkey was up to par with the secular and modern nations. Among the reforms initiated by this paper focuses on *children and women`s rights*.

Despite the serious post-war challenges such as poverty upon the inception of the Republic children`s right notion was coined and 23 April was accepted as “children`s day”. Since, children were regarded as symbolic and living indices of modernity and the new generation that would embrace republican ideals and projects. Children were perceived as the inheritors of the new republic and this can be observed at the Children`s Sovereignty day ceremonies. Children assume the role of the president, prime minister, ministers and other leading posts every year on April 23. In 1924 the world realized that despite the declaration of human rights there was still a need to specifically address children. Therefore, the “Geneva Declaration of the Rights of the Child” was declared and Turkey was anxious to collaborate with the sovereign states. Since then, Turkey endeavors to do her utmost to continue to promote the rights of children and to improve their living conditions. Signing and ratifying the UN Convention on the Rights of the Child in the 90`s, signing the Optional Protocol on the Sale of Children, Child Prostitution and Child Pornography and the Involvement of Children in Armed Conflicts are some examples of these efforts. However, despite the efforts put the governments have not been very successful in implementing broad-based social welfare programs targeting the perceived needs of children. Of the 15 million 247 thousand children between the age of six-seventeen 893 thousand of them are working and 50,2% of them are not going to

school. Of the 893 thousand working children 44,7% of them are in agriculture. Of the 84, 916 juvenile crime reported 32,331 is assault and battery and 24,604 is theft. 40 thousand children have been sexually harassed, abused and raped.

Similar picture is seen in women status, especially in terms of domestic violence since it has increased 1400% percent over the recent years. No, there is no mistake in the writing of the percentage. It is one thousand four hundred....One women is killed every other day. It is more than twice as high among females with no schooling /incomplete primary school compared to females with high school or higher education. The statistical data reveals that physical and sexual violence is related with educational level. The lower the educational level the higher is the physical and sexual violence. Although during the 8-year compulsory education the percentage of girls schooling increased it has decreased as of the implementation of the new system referred to as 4 + 4 + 4. Since the new system gave the home schooling right. Therefore, the low-SES families gave importance to the education of their sons and kept their daughters at home. This led to early teenage marriages. The civilian marriages is computed as 28%. However, these numbers do not reflect the religious marriages that are not recorded by the state. These marriages not being legal means women losing their legal rights and most importantly their schooling opportunity. Of the 1.237.172 births given this year, 355 of them are given by girls younger than 15 years and 93.873 of them by girls aged between 15-19. Depression, suicide, and birth mortality rates are at high level among child mothers. This is believed to be as a result of encouragement of the government for at least three children, giving birth to pregnancy as a result of rape and control over delivery mode inhibits the control and right of women of their own body. According to the OECD countries in 2011, the lowest employment rate (27,8 %) is in Turkey which means only three of the every ten people is women. Among the 134 countries Turkey is the 126th in terms of gender equality. It is very sad to see the limited almost none ownership of women of these reforms. Turkey is the only secular one among the Muslim countries. The

achievements of women and the practices of the government in those countries until today have been portraying a poor image. However, Atatürk initiated the reforms concerning women prior to women demanding them. In other words, they were given their rights without having to struggle for them. It is the only nation located in the Middle East that has abolished polygamy, which was officially criminalized with the adoption of the Turkish Civil Code in 1926, a milestone in Atatürk's reforms. Penalties for illegal polygamy set up to 2 years imprisonment and the equal rights of women in divorce, custody, and inheritance were recognized. The entire educational system from the grade school to the university became coeducational. He gave women the same opportunities as men, including full political rights. In the mid-1930s, 18 women, among them a villager, were elected to the national parliament. Later, Turkey had the world's first women supreme court justice.

## 2. METHODS

The two-phased project was carried out by non-governmental organization titled "Öz-Ge Der" (**Özgürlü ünden Yoksun Gençlerle Dayama Derne i** - Association for Solidarity with the Freedom-Deprived Juvenile) and Canadian Embassy. The primary school located at **ncesu** district of Ankara, the capital city of Turkey accepted to participate in the project. 120 7th and 8th grade students were the participants. Children and women rights are covered in the Civic Rights course. In order to assess the students knowledge level a proficiency test was given to them. One open ended questions was prompted so as to assess the students perception about what "children and womens' right meant for them" within 30 minutes. The papers were analyzed in terms of content, adequacy and relevancy, grammar and vocabulary via rubric. When the results of the test were reviewed it was seen that the students knowledge level of these rights was very low. A two weeks training was provided during the first phase of the study that consisted of providing various kinds of examples. Some of these examples were provided by the instructor while the others came from the students. Since they were asked to scan various newspaper articles or incidents reported in the internet or television. Discussions were carried out via these cases. The same test was used as post-test and results showed that students knowledge level had increased. Students were asked to shoot a short film during the second stage of the study. The test results were grouped as "low-mid-high" and nine students from these levels and among the volunteers were randomly selected to shoot the short film.. The families consent was obtained since the project was carried out after school. The theme of the movie was "*class representative elections*". The 5-minutes film was shot in three months. Some of the equipments

needed to shoot the film were obtained from members of the non-governmental organization who were working in the movie sector and some by the Canadian Embassy along with the financial support. Having watched the movie with the students and teachers discussions were carried out about "what children-women rights" meant for them. The reflective essays they wrote were used to identify their perception about the experience. Qualitative data via reflective essays were investigated, first, for evidence that students in fact learnt from the training provided, and, second, for evidence of a causal relationship between the active involvement of students and from their peers.

## 3. RESULTS AND DISCUSSIONS

Based on the data gathered it could be said that the design of the training and hands on experience enabled the students to learn from the teacher practices by adopting reflective approach and that the awareness about the children and womens` rights can be raised via hands-on experience and learning from peers.

## 4. CONCLUSIONS AND RECOMMENDATIONS

As the students graduate and move from secondary education to tertiary and from there on to their profession, they need to adapt to the new environments making use of their existing knowledge. They need to being given the opportunity to use their full potential, skills, abilities and knowledge to understand and appreciate "rights".

- Article 1: Definition of a child.
- Article 2: Children must be protected from discrimination.
- Article 3: The best interests of the child (taking into account the rights and duties of parents).
- Article 4: Legislative measures to implement the treaty.
- Article 5: The rights of parents.
- Article 6: The right to life.
- Article 7: The child's right to birth registration.
- Article 8: The child's right to a name, nationality and family relations.
- Article 9: The child's right not be separated from his or her parents against the child's will.
- Article 10: The child's right to maintain contact with both parents if they separate.
- Article 11: Measures against the illicit transfer of children abroad.
- Article 12: The child's right to be heard in any judicial and administrative proceedings.
- Article 13: The child's right to freedom of expression.
- Article 14: The child's right to freedom of thought.
- Article 15: The child's right to freedom of association.
- Article 16: The child's right to privacy.
- Article 17: The child's right to information from national and international mass media.
- Article 18: Parents or legal guardians have the primary responsibility for the child's upbringing.
- Article 19: State obligations to protect children against maltreatment and abuse.
- Article 20: State obligations to children temporarily or permanently deprived of their family environment.
- Article 21: State obligations to children with regard to adoption.
- Article 22: State obligations to children who are classed as refugees.
- Article 23: State obligations to children who are mentally or physically disabled.
- Article 24: State obligations to provide child health care services.

- Article 25: Children placed in physical or mental health care settings have the right to a periodic review of their circumstances and treatment.
- Article 26: The child's right to social security insurance and benefits.
- Article 27: The child's right to a standard of living adequate for the child's physical, mental, spiritual, moral and social development.
- Article 28: The child's right to education.
- Article 29: The goals to which a child's education should be directed, and the right of individual adults to establish and direct educational institutions.
- Article 30: The rights of children belonging to ethnic, religious or linguistic minority groups.
- Article 31: The child's right to rest, leisure and recreational activities.
- Article 32: The child's right to be protected from economic exploitation.
- Article 33: State obligations to protect children from the illicit use of narcotic and psychotropic drugs.
- Article 34: State obligations to protect children from sexual exploitation and sexual abuse.
- Article 35: State obligations to prevent the abduction or trafficking of children.
- Article 36: State obligations to protect children from all other forms of exploitation prejudicial to the child's welfare.
- Article 37: State obligations to ensure that children are not subjected to torture, inhuman or degrading treatment or punishments, including capital punishment or life imprisonment without the possibility of release.
- Article 38: State obligations to ensure that children under fifteen years do not take a direct part in wars or other hostilities, and to protect and care for children affected by armed conflict.
- Article 39: State obligations to promote physical and psychological recovery of child victims of torture, degrading treatment or armed conflict.
- Article 40: State obligations concerning children who infringe penal laws.
- Article 41: No part of the Convention shall override provisions contained in State laws which are more conducive to children's rights.





## The Developing Of The Graduates’ Professionalism At Universities: The Role Of Universities In Bridging Knowledge Into Workplace

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**Abstract:** Lack of professional capability among Graduates enforced higher education changing policy from knowledge based outcome into generics skills based outcomes. This changing policy context has given weight in developing the competencies to enable graduate working in multi-disciplinary situation. This paper discusses the concept of the developing core competencies in teaching and learning at university level. It also argues on the contribution of higher education to produce qualified, capable and illegible graduates. For obtaining the current challenges of work place requirement, teachers at universities should change approach of teaching from the talking and chalking into communicative, productive, cooperative, and collaborative knowledge practice model. University must redefine the curriculum which is not only aim to develop students’ specific discipline but in more advance and relevance is to provide students’ with the professional skills namely communication skill, IT skill, numeracy, learning how to learn, problem solving, working with others, and subject content competencies. By this manner, graduates of university will be endowed with three major professional attributes namely employability, lifelong learning and good citizenship.

**Keywords:** University graduate, professional competencies, developing core competencies.

### 1 INTRODUCTION

Higher education is being exhorted, as much as government and the professional institutions, to change long-established practices and to take a broader and more integrated approach to education and training. The reasons for this relatively recent perspective on the skills debate are manifold. Most of debates claimed that higher education in particular is failing to deliver sufficient graduates with the right portfolio of skills. Some traced the problem back to the national curriculum, while most focused on the compartmentalized system of higher education, where they found that most courses were dominated by too narrow a professional focus (Robson and Bailey, 2008).

The new paradigm of HE placed quality and relevance of higher education as the main priority and core of national higher education development (UNESCO, 2006). It is expected that by 2010, Indonesia will have a competitive leverage due to the existence of highly reputable higher education institutions, and it is believed that a strong higher

education program will lead to a nation’s competitiveness (Basic Framework for Higher Education Development KPPTJP IV, 2003).

The Education Ministry of Indonesia stated that higher education has a critical role of producing qualified graduates, and if quality higher education is the target to achieve. Indonesia realizes that to improve the quality of its human resources both the problems of access and quality have to be taken into account in finding out their solution (Basic Framework for HE Development KPPTJP IV, 2003).

In short, a higher education system which provides its students with these skills will born strong generation who will contribute to the society and the country (Bennete, et al, 2000).

### 2 PROFFESIONAL COMPETENCIES

The ‘professional competencies’ is defined as observable and measurable knowledge, as well as the generic, transferable skills that students need in

order to become professional employees in the field of their study and work. The competencies most commonly referred to in the professional context are critical thinking, analytical skills, communication, team work, and problem solving (Candy et al, 1994; Tempone and Martin 2000; LTSN, 2002). In the same meaning, Robson and Bailey (2008) stated that that professional development is the place for tips on soft skill development (including performance management, communication, time management, goal setting, team building, and more), instructional design, technical training, corporate training options, and many other topics to inspire professional development and learning.

This paper is attempting to reconfigure the developing of professional competencies of graduates during their study at university. The professional competences are re-extracted from several references into seven competencies namely; numeracy, IT Skill, learning how to learn, problem solving skills, working with others, subject specific competencies. The definitions of the competencies are elucidated in Table 1 below.

Table 1. The definition of the seven core competencies

PROFESIONAL COMPETENCIES	DEFINITION
<b>Communication Skills</b>	Communication skills refers to one's ability to use active listening, writing skills, oral communication, presentation skills, questioning and feedback skills in order to establish successful communication.
<b>Numeracy</b>	Numeracy is defined as the aggregate of skills, knowledge, beliefs, patterns of thinking as well as the communicative and problem solving processes that an individual must possess in order to handle, perform and interpret real world tasks and problems in an effective manner.
<b>Information Technology</b>	Information Technology refers to one's ability to use computers, software applications, databases and other technologies as well as possessing critical cognitive skills and knowledge in order to achieve various academic, work-related and personal goals
<b>Learning How to Learn</b>	Learning how to learn is defined as acquiring sets of skills and knowledge for one to learn efficiently and effectively in any learning situation that one encounters.
<b>Problem Solving</b>	The ability of the individual to tackle problems systematically, for the purpose of working towards the solution and learning from this process.
<b>Working with Others</b>	The ability of the individual to meet own responsibilities and work cooperatively in pair or group of people for the purpose of achieving shared objectives.
<b>Subject Content Competencies</b>	One's possession of knowledge, capabilities and dispositions to organize and provide instruction at the appropriate level of the study which inter-relate with subject content learned.

(Bennett, et. al 2000; QCA, 2002; Crebert, 2003; Zalizan Mohamad Jelas, et. al, 2006)

## 2.1 Developing Professional Competencies at University

Professionalism is the ability of a worker to perform core competencies; communication skills, numeracy skills, IT skills, learning how to learn skills, critical thinking skills, problem solving skills, and subject specific competencies at a workplace also means that the workers are able to perform a good work as a professional (Bennett, et. al 2000 & Bailey, 2005)

It is a responsibility of universities to develop capacities of professional competencies through syllabus content and the method of content delivery. This will strengthens the justification for a role of HE in developing professionalism and sustain lifelong learning capacities among graduates.

In action plan at university level, the professional competencies should be embedded within the contexts of the students' discipline or professional field. Some studies had been toward the development of professional competencies at University. The combination of theory and practice of teaching and learning is used together the development of professional competencies into curriculum of university. Here below the guidance of development of professionalism for graduate during at university are discussed. The discussion encompass seven core competences namely; numeracy, IT Skill, learning how to learn, problem solving skills, working with others, subject specific competencies.

## 2.2 Developing communication skills

There is a concurrent commitment among universities to the integration of teaching and learning communication skills across discipline. Communication skills can be taught using an experiential learning approach and focusing on verbal and written forms of communication. The Learning and Skills Development Agency (LSDA, 2004) which manages the Key Skills Support Programmed has suggested the teaching and learning of communication skills in three main areas. For speaking and listening skills, LSDA suggests ample opportunities be given to learners to develop their confidence in speaking and listening particularly during presentations. For reading and information skills, students need to be trained in the ability to locate information sources as well as extracting relevant data from these sources. As for

writing skills, students will need to be exposed to different forms of written communication such as reports and business letters as well as spellings and punctuations.

### 2.3 Developing numeracy skills

Curry et al (1996) study numeracy in relation to adults' working experiences and their suggestions are taken into account of in the teaching and learning of Mathematics so as the adult numeracy curriculum is seen to be restructured in a more meaningful way. Their suggestions are summarize as follows;

- Use learner-centered approaches to ensure learners see the relevance of what they are learning (Curry et al, 1996).
- Use an interdisciplinary approach to teaching – it should be incorporated into other literacy development like reading and writing and also using math content/skill like reasoning and problem solving (Curry et al, 1996).
- Link new math learning to previous learning – Linkages/Connections must be made with other math concepts, skills and prior knowledge (Kerka, 1995).
- Teach concepts before rules (Curry et al, 1996).
- Practice contextualized Mathematics using the constructivist approach to learning. This means students use their prior and new knowledge to construct their own understanding and make new meanings (Kerka, 1995).

Individual learning style preferences should be considered in numeracy instruction (Kerka, 1995).

### 2.4 Developing information technology skills

The Dearing Report suggests the use of computer-based program such as tutorials, exercises, educational games, learning tools helps to develop students' understanding of ideas and articulate their own views or ideas (Dearing Report, 1997). Kruger (2000) stated that learners are placed in the virtual learning resources, and are exposed to interactive communication with other learners, experts and mentors. Thus, they are engaged in lifelong, active learning with the easy access to information and knowledge. Here general guidance for lecturer to enhance students' IT skills:

#### a. Computer Literacy

- Practice the basic operation and maintenance of computer
- Running basic program Installer (window installer, Microsoft office installer, antivirus installer and updater, etc.)
- Using computer-assisted to complete assignment effectively, efficiently, practically, systematically and safely.
- Using specialized computer applications like music composition software, computer assisted drawing and drafting programs, mathematics modeling software, etc.

#### b. Cyber Learning

- Integrating an online collaborative projects into your classroom
- Managing classroom and technology resources available (e.g. searching, accessing, and promoting information)
- Use synchronous (teleconference, chatting room, virtual learning, e.tc) and in-synchronous (email, e-learning, web-based learning, etc).
- Downloading, transferring and converting online resources (music, film, video, etc) into computer.
- E.tc.

### 2.5 Developing information technology skills

Smith (1982) suggests three ways of incorporating learning how to learn skills. Self-directed learning allows learners to be autonomous and direct their own learning. Collaborative learning improves group membership skills and teamwork development. And institutional learning is using instructors as resources for learning and study skills improvement. The way how we use and interpreted the methods, it is rely on lecturer and classroom creativity. The point is the students are able to determine and obtain their learning outcomes after the actual learning experiences. However, Hosnkins and Fredriksson (2008) suggest some practical review for the competence development as follows:

- Establishes the extent to which learners regard the process of learning is itself learnable;
- Demonstrates learner's desire to find out new things;

- Affirms the extent to which learners are on the lookout for links between what they are learning and what they already know;
- Finds out how easily learners are disheartened when they get stuck or make mistakes;
- Establishes the learners' ability to look at things in different ways;
- Establishes the learners' ability to manage the balance between sociable and individual approaches to learning;
- Finds out learners' awareness of their own learning processes.

(Hosnkins and Fredriksson, 2008)

## 2.6 Developing learning problem solving skills

Kirkley (2003) suggest that developing problem solving should be offered in context, and students should learn content while solving realistic problems. While Mettler (1995) proposed a developing problem-solving method that he called "structured discovery learning." This method requires students' active involvement and self-direction in the *problem-solving* process. It consists of the following three phases: (1) the preparation phase: identifying a *problem* and its nature, (2) the search phase: relating the *problem* to similar past experiences and devising hypotheses to explain it, and (3) the resolution phase: finding a solution to or an explanation of the *problem*.

Everyone has a particular approach to dealing with *problems*, which is called *problem* orientation. *Problem* orientation is comprised of cognitive, emotional, and behavioral components. The cognitive component includes recognizing and appraising the *problem* and one's ability to cope with it. However, the features of learning problems solving are commonly comprise following procedures;

- Using stimulus material to help students discuss an important problem, question or issue;
- Presenting the problem as a simulation of professional practice or a 'real life' situation;
- Appropriately guiding students' critical thinking and providing limited resources to

help them learn from defining and attempting to resolve the given problem.

- Having students work cooperatively a group, exploring information in and out of class, with access to a tutor (not necessarily a subject specialist) who knows the problem well and can facilitate the group's learning process;
- Reapplying this new knowledge to the original problem and evaluating their learning processes.

(Bennete; 200; QCA, 2002; Lesmeiste, 2005)

## 2.7 Developing learning problem solving skills

Watson (1997) state that the developing working with others is based on experiential learning theory, as well as teamwork theory developed largely in the industry context. However, developing working with others is not a constant, experienced in the same way by all learners, but rather, a dynamic interaction between the whole learner (including conceptions of learning, values, beliefs, emotional responses, pre-existing knowledge, skills, learning style, motivation, attitudes, prejudices, etc), the learning environment, subject matter, learning process and a host of other factors. The main role of lecturer is motivating students to learn more effectively together, improving behavior in class, on the playground and socially, and helping students take responsibility for themselves and each other. Group discussion, individual sharing idea, getting conclusion remark from a topic of lesson in order to obtain teamwork's product of activity is examples of working with others development.

## 2.8 Developing and learning subject specific core competencies

Subject core competencies refer to students' area of knowledge at university. Ellis, et. al (2005) draw that developing students subject specific competencies include the requisite knowledge, principles, and concepts of their field of the study. The development of core competencies is emphasized upon specific knowledge materials which is developed together with others competencies; communication, numeracy, IT skills, learning how to learn, problem solving, and working with others. The delivering method of subject specific core competencies can be lecture,

discussion, group task, PBL, IT usage, fieldwork visit, assignment, presentation et cetera, with refer to the integration of knowledge and skills development in the classroom.

Learning and Skills Development Agency-LSDA (2000) posters guidance of the development of specific knowledge and skills in the classrooms;

- Identifying the areas they need to work on
- Planning activities with students
- Helping them gain knowledge as well as develop skills
- Reviewing their progress and giving feedback
- Learning to reflect is an important step to achieving independence.
- Reflecting critically one’s own experience is essential. Reflect on how you used particular knowledge and skills and what might work better.

(LSDA, 2000:25)

## 2.9 Outcome of Professional Competencies Development at Universities

Three intended outcomes of higher education namely employability, lifelong learning and good citizenship.

**Employability**, one’s possession of qualities and competences in order to meet the changing needs of employers and customers. It is to do with ‘the capacity to gain initial employment, maintain employment and obtain new employment if required.

**Lifelong Learning**, lifelong learning lifelong learning places certain roles and responsibilities on individuals to develop or upgrade their own capacity based on ‘the notion of learning from the cradle to the grave’. This seems to imply that learning is an ongoing process which occurs throughout one’s lifetime.

**Good Citizenship**, the abilities of graduate to perform the core competencies as also technical academic skills will much contribute to their country development. It involves several elements such as ‘a commitment to the pursuit of truth, a responsibility to share knowledge and a willingness to listen to alternative views and judge them on their merits.’

(Bennett, et. al 2000; QCA & Zalizan Mohamad Jelas, et. al, 2006)

## 2.10 The summary of developing professional competencies

The teaching approach is no longer monotonies on lecture and slide presentation only where a lecture standing in front of class exchange slide by slide. The teaching and learning at university level now, is students centered where the student build their core competencies by various activities in the classroom. The graft below attempted to draw the summary of core competencies development and practice in the classroom. (see the picture on appendix)

## 3 CONCLUSION

However, one’s ability of combining specifics knowledge with other competencies is a tremendous professional achievement that can be applied in taking a quick and accurate action in real work environment. Both specific knowledge and skills rely heavily on generic skills; communication skills, IT skills, numeracy skills, problem solving skills, learning how to learn and working.

The university in should envisage that every single graduate of the university posses the seven attributes. The seven skills could be carried out in delivering course content. Finally by equipping students with the professional competencies they will succeed as professionals and responsible members of society. Employability, lifelong learning, and good citizenship as quality measurement of university outcome could be attained.

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APPENDIX

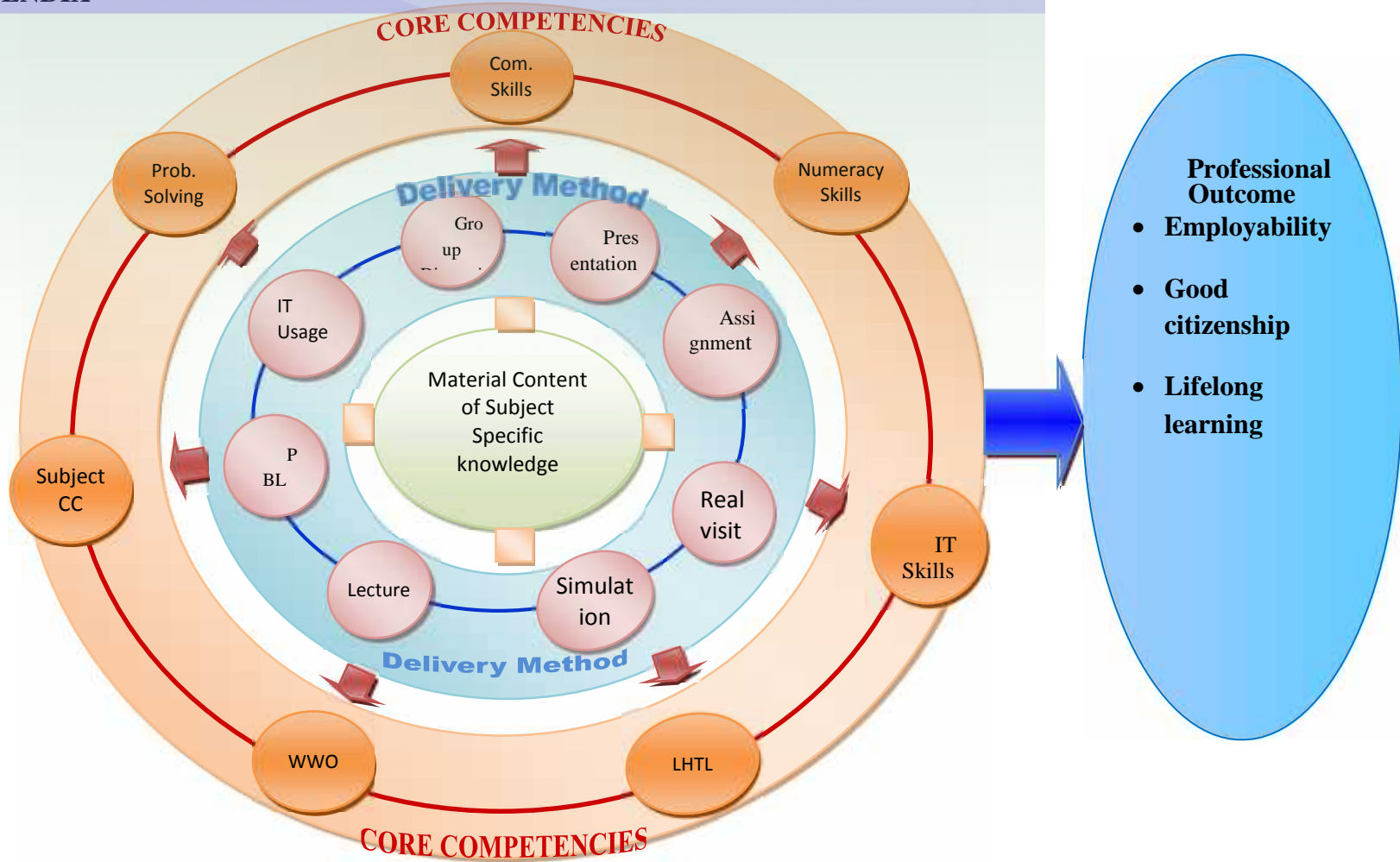


Figure 1. The Summary of Soft Skills Competencies Development



## Assessing Students’ Statistical Reasoning

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**Abstract:** One of the purposes of statistical learning is to develop students' statistical reasoning. To determine students' statistical reasoning required assessment to measure the statistical reasoning skills. Assessment is used as information for teachers about students' understanding and reasoning processes, to develop instructional practices, and to help students learn how to improve their performance. This article uses assessment as bases, developed from the SRA and ARTIST instruments, consists of 20 multiple choice items, based on the type of reasoning from Garfield (2003). The results showed that the mean score are less than 60 (Mataram University:  $\bar{x} = 54,39$ ; Nusa Cendana University:  $\bar{x} = 53,88$ ; STKIP Garut:  $\bar{x} = 38,10$ , and Galuh University:  $\bar{x} = 37,06$ ). These results indicated that students statistical reasoning are still low, so it needs a real effort to improve the learning process.

**Keywords:** Statistical Reasoning, Assessment, Statistical Reasoning Assessment (SRA), The Assessment Resource Tools for Improving Statistical Thinking (ARTIST)

### 1. INTRODUCTION

The study of statistical reasoning has been done by experts and researchers (e.g., Garfield, 2002, 2003; Wang, Wang, & Chen, 2009). These studies emphasize the importance of statistical reasoning and try to develop statistical reasoning skills in middle school students and analyze the difficulties/misconceptions in statistical reasoning. The importance of literacy, reasoning, and statistical thinking, encourage the development of instruments that can measure such capabilities. There are some assessments that have been developed by experts to measure the literacy skills, reasoning, and statistical thinking, like: 1). The Statistical Reasoning Assessment (SRA), 2). The Statistics Concepts Inventory (SCI), 3). The Assessment Resource Tools for Improving Statistical Thinking (ARTIST). These instruments assess literacy, reasoning, and statistical thinking skills of students.

A good assessment, of course, is an assessment prepared in accordance with the learning objectives that have been set. These instruments also have done it. In this study, researchers tried to combine the two instruments, the SRA and the ARTIST to measure statistical reasoning skills of students who have taken courses in Introductory Statistics. The reason for choosing these two instruments because The SCI “was written for a specific audience of engineering students in statistics” (Delmas, Garfield, Ooms, & Chance, 2007: 29). Because the study was conducted in Mathematics Education program at the college, it was decided not to use the SCI.

According to Garfield (Delmas, et al. 2007), ‘SRA focuses heavily on probability, and lacks

items related to data production, data collection, and statistical inference’. ARTIST consists of Comprehensive Assessment of Outcomes for a first course in Statistics (CAOS) with 40 multiple choice items and 11 multiple choice section, namely Data Collection, Data Representation, Measures of Center, Measures of Spread, Normal Distribution and Measures of Position, Probability, Sampling Variability, Confidence Interval-One Sample, Tests of Significance, Bivariate Data, Quantitative, Bivariate Data, Categorical. From these considerations, researchers compile instrument adapted from the SRA and ARTIST, consists of 20 multiple choice items as bases on the type of reasoning, developed from Garfield (2003).

This study only provides about using instruments that have been made to see how the statistical reasoning abilities of students who have taken Introductory Statistics. The results are expected to be a reference to improve the learning process for this case, which is expected to increase student achievement.

### 2. GOALS FOR STUDENTS IN AN INTRODUCTORY COURSE

To compile the assessment instrument, adapted to the learning objectives to be achieved. Learning objectives in an Introductory Statistics from GAISE report (American Statistical Association (ASA), 2010: 12-13), are:

Students should believe and understand why:

- Data beat anecdotes
- Variability is natural, predictable, and quantifiable

- Random sampling allows results of surveys and experiments to be extended to the population from which the sample was taken
- Random assignment in comparative experiments allows cause and-effect conclusions to be drawn
- Association is not causation
- Statistical significance does not necessarily imply practical importance, especially for studies with large sample sizes
- Finding no statistically significant difference or relationship does not necessarily mean there is no difference or no relationship in the population, especially for studies with small sample sizes

Students should recognize:

- Common sources of bias in surveys and experiments.
  - How to determine the population to which the results of statistical inference can be extended, if any, based on how the data were collected.
  - How to determine when a cause-and-effect inference can be drawn from an association based on how the data were collected (e.g., the design of the study).
  - That words such as “normal,” “random,” and “correlation” have specific meanings in statistics that may differ from common usage
- Students should understand the parts of the process through which statistics works to answer questions, namely:
- How to obtain or generate data
  - How to graph the data as a first step in analyzing data, and how to know when that’s enough to answer the question of interest
  - How to interpret numerical summaries and graphical displays of data—both to answer questions and to check conditions (to use statistical procedures correctly)
  - How to make appropriate use of statistical inference.
  - How to communicate the results of a statistical analysis

Students should understand the basic ideas of statistical inference, including:

- The concept of a sampling distribution and how it applies to making statistical inferences based on samples of data (including the idea of standard error).
- The concept of statistical significance, including significance levels and p-values .
- The concept of confidence interval, including the interpretation of confidence level and

margin of error goals for students in an introductory course: what it means to be statistically educated

Finally, students should know:

- How to interpret statistical results in context.
- How to critique news stories and journal articles that include statistical information, including identifying what’s missing in the presentation and the flaws in the studies or methods used to generate the information.
- When to call for help from a statistician

Seeing the goals recommended by the ASA, requires a lot of skills to achieve that. To measure the skills, of course, takes a long time and continuously. Due to time constraints, the researchers tried to adopt learning goals by type of reasoning developed by Garfield (2003: 25), consists of:

*Reasoning about data:* recognizing or categorizing data as quantitative or qualitative, discrete or continuous; and knowing how the type of data leads to a particular type of table, graph, or statistical measure.

*Reasoning about representations of data:* understanding the way in which a plot is meant to represent a sample, understanding how to read and interpret a graph and knowing how to modify a graph to better represent a data set; being able to see beyond random artifacts in a distribution to recognize general characteristics such as shape, center and spread.

*Reasoning about statistical measures:* understanding what measures of center, spread, and position tell about a data set; knowing which are best to use under different conditions, and how they do or do not represent a data set; knowing that using summaries for predictions will be more accurate for large samples than for small samples; knowing that a good summary of data includes a measure of center as well as a measure of spread and that summaries of center and spread can be useful for comparing data sets.

*Reasoning about uncertainty:* understanding and using ideas of randomness, chance, likelihood to make judgments about uncertain events, knowing that not all outcomes are equally likely, knowing how to determine the likelihood of different events using an appropriate method (such as a probability tree diagram or a simulation using coins or a computer program).

*Reasoning about samples:* knowing how samples are related to a population and what may be inferred from a sample, knowing that a larger, well chosen sample will more accurately represent a population and that there are ways of choosing a sample that make it unrepresentative

of the population; being cautious when making inferences made on small or biased samples.

*Reasoning about association:* knowing how to judge and interpret a relationship between two variables, knowing how to examine and interpret a two way table or scatterplot when considering a bivariate relationship, knowing that a strong correlation between two variables does not mean that one causes the other.

The type of reasoning by Garfield, based on the concepts and key ideas in Statistics, are: data, probability, samples, sampling variability, inference, and association. The goals for students are achieved in introductory statistics simpler than in ASA, but covers all the big idea/ key aspects in Statistics.

### 3. DEFINITION AND DEVELOPMENT OF STATISTICAL REASONING

Reasoning skills role in understanding concepts and problem solving. Delmas (2002), separating three learning outcomes (cognitive) in Statistics, are literacy, reasoning, and thinking. Tasks that can distinguish three learning domains can be seen in Table 1 below:

Table 1. Tasks that distinguish learning outcomes in Statistics

BASIC LITERACY	REASONING	THINKING
IDENTIFY	WHY?	APPLY
DESCRIBE	HOW?	CRITIQUE
REPHRASE	EXPLAIN	EVALUATE
TRANSLATE	(THE PROCESS)	GENERALIZE
INTERPRET		
READ		

Source: Delmas, 2002.

From the table 1, reasoning asks students to explain why or how the results obtained, describes the process that occurs. According to Rumsey, Garfield, and Chance (Delmas, 2002), ‘the difference is not clear because of the overlap in the domain’. Often, the skills of the area included in the skills of others. However, from a learning perspective, it shows that the learning activities may have the potential to develop more than one such capabilities.

To describe the definition about statistical reasoning, Garfield, Delmas, & Chance (Ben-Zvi & Garfield, 2004) defined Statistical reasoning as the way people reason with statistical ideas and make sense of statistical information. This involves making interpretations based on sets of data, representations of data, or statistical summaries of

data. Statistical reasoning may involve connecting one concept to another (e.g., center and spread), or it may combine ideas about data and chance. Reasoning means understanding Reasoning means understanding the concepts and can explain why, how, and explain the process.

So the statistical reasoning is the ability of students to explain why, how about sets of data, representations of data, or statistical summaries of data. To develop statistical reasoning, Garfield & Ben-Zvi (2009), make a design model for improving students' statistical reasoning ability called Statistical Reasoning Learning Environment (SRLE). SRLE is a class of effective and positive statistics to help students develop statistical reasoning. This approach is called learning environment because that is interactive combination of text materials, classroom activities, and culture, discussion, technology, teaching approaches, and assessment. This model is based on constructivism learning model.

In a constructivist classroom teacher does not teach how to resolve the issue, but the present problems and encourage students to find their own way to solve the problems (Suherman, Turmudi, Suryadi, Herman, Suhendra, Prabawanto, Nurjanah, & Rohayati, 2003). The role of students in the setting of constructivism, is student centered. Students actively utilizing prior knowledge to forming new knowledge by students, either true or false. The role of the teacher, as a facilitator to correct misconceptions. Students are required to express their opinions according the level of thinking, or teachers make groups, and students learn from other students in a group setting to share information and develop a common understanding. Students must proactively engage and facilitate teachers support students so as not to be hampered in the formation of new knowledge. Maximize the principles of constructivism, which was originally expected misconceptions by students can be improved with active student involvement in learning.

### 4. ASSESSMENT OF STATISTICAL REASONING

When the lecturer wants to determine the skills of students in learning, it requires assessment. By conducting the assessment, the lecturer will know the difficulties experienced by students and may be a reflection of the lecturer. However, “assessment results are only estimates of what a person knows and can do” (Garfield & Ben-Zvi, 2008: 66). Definition about assessment proposed by (Berry & Adamson, 2011: 3), “assessment has a variety of connotations for different people, depending on the

nature of their participation in the assessment process". For schoolchildren, an impending examination, test or euphemistic quiz can be a cause for alarm and despondency; for teachers, there is the administrative burden of setting and grading assessments, with the concomitant concern that they will be judged on their students' results; for admissions officers in tertiary institutions and employers, assessments are required to provide important information for the purposes of selection; for government ministers, assessment results enable them to evaluate the effectiveness of the education system and how it compares with that of other states through the rankings in comparative studies. Assessment can be used for grading, selecting, diagnosing, determining mastery, guiding and predicting.

Thus, the assessment describes the various measures taken to collect and use information about knowledge, attitudes, or skills of a person. "The functions are mainly two folds: (1) for making judgments of the performance of individuals or the effectiveness of the system and (2) for improving learning" (Berry & Adamson, 2011: 5).

Popham (1994), divides into several assessment, ie select-response tests, tests of construct-response, performance assessment, portfolio assessment, and assessment of affective. Although statistical reasoning may best be assessed through one-to-one communication with student (e.g., interviews or observations) or by examining a sample of detailed, carefully designed paper-and-pencil instruments can be used to gather some limited indicators of students reasoning (Garfield, 2003: 24). From this, to measure the statistical reasoning can be used SRA. In addition, instruments have been developed to measure literacy, reasoning, and statistical thinking is *Assessment Resource Tools for Improving Statistical Thinking* (ARTIST). ARTIST instruments downloaded from <http://app.gen.umn.edu/artist/> with advance registration. After successful registration, will be obtained several components of matter that consists of the Comprehensive Assessment of Outcomes in Statistics (CAOS) which consists of 40 multiple choice questions and 11 multiple choice questions section is divided into key content Statistics, namely Data Collection, Data Representation, Measures of Center, Measures of Spread, Normal Distribution and Measures of Position, Probability, Sampling Variability, Confidence Interval-One Sample, Tests of Significance, bivariate Data, Quantitative, bivariate data, Categorical. Test instruments developed by type of statistical reasoning from Garfield (2003).

## 5. RESEARCH METHODS

This research uses descriptive method in order to determine the students statistical reasoning in Introductory Statistics. Subjects were students who have take the course of the school year 2014/2015, Mataram University, in West Nusa Tenggara, consists of 49 students, Nusa Cendana University, in NTT consists of 58 students, STKIP Garut, in West Java, consists of 50 students, and Galuh University in West Java, consists of 34 students. The sample total in this study was 191 students. Sampling was done by using purposive sampling. Purposive sampling is a sampling technique with particular consideration (Sugiyono, 2012). The consideration include: Introductory Statistics is an essential subject in Mathematics Education courses in Indonesia and has the same syllabus, researchers get a friend who teaches Introductory Statistics in various universities, both public and private college. This was done to compare the ability of statistical reasoning in public and private college students.

The number of incorrect could be a clue how far the student mastery of the material. The data collected from answers given test students on statistical reasoning. Instruments to measure the ability of statistical reasoning adopted from the problems that exist in *Assessment Resource Tools for Improving Statistical Thinking* (ARTIST) and *Statistical Reasoning Assessment* (SRA). Below in table 2 and 3 are given the relationship between the type of statistical reasoning and the instruments ARTIST, SRA, and the development instrument.

Table 2. The relationship between the type of statistical reasoning and instruments used ARTIST and SRA

The Type of Reasoning	ARTIST Component	Number of ARTIST	Number of SRA	Item
Reasoning about data	ARTIST Scale - Data Collection	1,5		1,7
Reasoning about representation of data	ARTIST Scale - Data Representation	7,12		7,8
Reasoning about statistical measures	<ul style="list-style-type: none"> <li>• ARTIST Scale - Measures of Center</li> <li>• ARTIST Scale - Measures of Spread</li> <li>• ARTIST Scale - Normal Distribution and Measures of Position</li> </ul>	<ul style="list-style-type: none"> <li>• 1</li> <li>• 1,4</li> <li>• 1,3</li> </ul>	<ul style="list-style-type: none"> <li>• 1</li> <li>• 7,5</li> <li>• 9,10</li> </ul>	<ul style="list-style-type: none"> <li>• 5,6</li> <li>• 7,8</li> <li>• 9,10</li> </ul>
Reasoning about uncertainty	ARTIST Scale - Probability	2,9		11,12
Reasoning about samples	<ul style="list-style-type: none"> <li>• ARTIST Scale - Sampling Variability</li> <li>• ARTIST Scale - Confidence Interval-One sample</li> <li>• ARTIST Scale - Tests of Significance</li> </ul>	<ul style="list-style-type: none"> <li>• 2</li> <li>• 3</li> <li>• 2,1,4</li> </ul>	<ul style="list-style-type: none"> <li>• 2</li> </ul>	<ul style="list-style-type: none"> <li>• 13</li> <li>• 14</li> <li>• 15</li> <li>• 16,1</li> <li>• 7,16</li> </ul>
Reasoning about association	ARTIST Scale - Bivariate Data, Quantitative	0,1		19,20

Table 3. Development of statistical reasoning test instrument

Item no.	Indicator	Item	MCQ	Yes/No	Yes
Measuring data type	1. Identifying the appropriate data type for a given situation (text, graph, or table).	1. Identifying the appropriate data type for a given situation (text, graph, or table).			12
Measuring data visualization	2. Interpreting data visualization (text, graph, or table).	2. Interpreting data visualization (text, graph, or table).			14
Measuring data analysis	3. Analyzing data visualization (text, graph, or table).	3. Analyzing data visualization (text, graph, or table).			16, 17, 18, 19
Measuring data interpretation	4. Drawing conclusions from data visualization (text, graph, or table).	4. Drawing conclusions from data visualization (text, graph, or table).			11, 12
Measuring data application	5. Applying data visualization (text, graph, or table).	5. Applying data visualization (text, graph, or table).			13, 14, 15, 16, 17, 18
Measuring data synthesis	6. Synthesizing data visualization (text, graph, or table).	6. Synthesizing data visualization (text, graph, or table).			19, 20

Table 5. Items with less than 60% of the student correct (adapted from Delmas et al. 2007 and Garfield, 2003)

Item	Type of Reasoning	Minimum Learning Objective
1	Reasoning about data	Ability to recognize data as quantitative or qualitative, discrete or continuous
2	Reasoning about data	Ability to recognize types of data: discrete, categorical, experimental, and other
3	Reasoning about statistical measures	Understanding the context when measures of central tendency about a data set
4	Reasoning about statistical measures	Understanding how to select an appropriate average
5	Reasoning about statistical measures	Ability to compare the statistical about scores contained in identical normal distributions
6	Reasoning about statistical measures	Ability to identify statistical distributions
12	Reasoning about sample	Knowing how samples are related to a population and statistical conclusions
14	Reasoning about sample (Confidence Interval - One sample)	Ability to calculate a confidence interval
15	Reasoning about sample (Confidence Interval - Two sample)	Ability to calculate a confidence interval
17	Reasoning about sample (Confidence Interval - Two sample)	Ability to identify the significance of a p-value
18	Reasoning about sample (Confidence Interval - Two sample)	Ability to identify the significance of a p-value
19	Reasoning about sample (Confidence Interval - Two sample)	Ability to identify about error type
20	Reasoning about sample (Confidence Interval - Two sample)	Ability to identify statistical significance with respect to correlation
21	Reasoning about association	Ability to recognize a relationship between two or more variables from a scatterplot

Here is some picture when the college students take the test.



## 6. RESULTS AND DISCUSSION

### 6.1 Results

This test is a 20 multiple choice test about statistical reasoning. The test is given to students who have taken Introductory Statistics. The sample totaled 191 students, consisting of 49 college students from the Mataram University; 58 college students from the Nusa Cendana University; 50 college students of STKIP Garut, and 34 college students of Galuh University. Tests conducted on October 29, 2014 at the Mataram University; October 31, 2014 in Nusa Cendana University and Galuh University, November 1, 2014 in STKIP Garut. The timing of the test as much as 60 minutes. Table 4 shows the percentage of students who answered correctly.

Table 4. Percent of students correct on the test

Item	Mataram University		Nusa Cendana University		STKIP Garut		Galuh University	
	Correct (%)	Incorrect (%)	Correct (%)	Incorrect (%)	Correct (%)	Incorrect (%)	Correct (%)	Incorrect (%)
1	51.31	48.69	41.38	58.62	42.00	58.00	35.29	64.71
2	28.77	71.23	31.03	68.97	34.00	66.00	23.53	76.47
3	71.23	28.77	68.97	31.03	66.00	34.00	76.47	23.53
4	40.84	59.16	37.93	62.07	38.00	62.00	32.35	67.65
5	33.51	66.49	35.29	64.71	36.00	64.00	27.06	72.94
6	50.26	49.74	42.03	57.97	43.00	57.00	38.24	61.76
7	60.21	39.79	57.97	42.03	58.00	42.00	51.47	48.53
8	78.53	21.47	76.27	23.73	77.00	23.00	70.59	29.41
9	53.40	46.60	51.70	48.30	52.00	48.00	45.88	54.12
10	53.40	46.60	51.70	48.30	52.00	48.00	45.88	54.12
11	67.54	32.46	65.52	34.48	66.00	34.00	60.29	39.71
12	33.51	66.49	35.29	64.71	36.00	64.00	27.06	72.94
13	42.41	57.59	40.34	59.66	41.00	59.00	34.71	65.29
14	42.41	57.59	40.34	59.66	41.00	59.00	34.71	65.29
15	31.41	68.59	33.51	66.49	34.00	66.00	23.53	76.47
16	61.26	38.74	59.16	40.84	60.00	40.00	55.88	44.12
17	53.40	46.60	51.70	48.30	52.00	48.00	45.88	54.12
18	53.40	46.60	51.70	48.30	52.00	48.00	45.88	54.12
19	53.40	46.60	51.70	48.30	52.00	48.00	45.88	54.12
20	53.40	46.60	51.70	48.30	52.00	48.00	45.88	54.12
Mean (SD)	48	52	48	52	48	52	48	52
Standard Deviation	24.22	25.78	23.33	26.67	23.20	26.80	21.04	28.96

Interestingly, the mean from public university (Mataram University and Nusa Cendana University) is almost the same, around 54.39 and 53.88. Same as, the mean from private university (STKIP Garut and Galuh University) is almost the same, around 38.10 and 37.06. Items about which less than 60% of students answered correctly for Public universities are also relatively the same, is item 2, 6, 9, 12, 14, 15, 17, 19, and 20. For private universities, items with less than 60% of the students correct answer is item 1, 5, 6, 9, 12, 14, 15, 17, 19, and 20.

And here is some items with less than 60% of the student correct.

6). A small object was weighed on the same scale separately by nine students in a science class. The weights (in grams) recorded by each student are shown below.

6.2; 6.0; 6.0; 15.3; 6.1; 6.3; 6.2; 6.15; 6.2

The students want to determine as accurately as they can the actual weight of this object. Of the following methods, which would you recommend they use?

- A. Use the most common number, which is 6.2
- B. Use the 6.15 since it is the most accurate weighting.
- C. Add up the 9 numbers and divide by 9
- D. Throw out the 15.3, add up the 8 numbers and divide by 8.

Questions relating to the reasoning about statistical measures. Related to the question, Garfield (2003: 27) reveals that misconceptions involving averages (averages are the most common number, fails to take outliers into consideration when computing the mean, compares groups based on their averages, confuses mean with median).

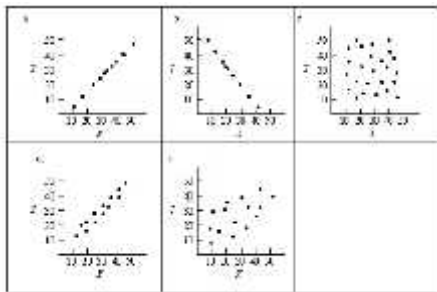
17). The following message is printed on bottle of prescription medication:

WARNING: For applications to skin areas there is 15% chance of developing a rash. If a rash develops, consult your physician.

Which of the following is the best interpretation of this warning?

- A. Don't use the medication on your skin, there is a good chance of developing a rash.
- B. For application to the skin, apply only 15% of the recommended dose.
- C. If a rash develops, it will probably involve only 15% of the skin.
- D. About 15 of 100 people who use this medication develop a rash.
- E. There is hardly a chance of getting a rash using this medication.

The question relating to the meaning of probability. This relates to the risk factors that may occur in a study.



20). Select the scatterplot that shows the strongest relationship between the X and Y Variables?

- A. a
- B. b
- C. a and b
- D. a and d
- E. a, b, and d

This question, of course, can be answered if the students have been accustomed to learning supported by technology, in this case by using the software.

## 6.2 Discussion

Of all the types of reasoning, it all still be difficulties experienced by students. From the results obtained, the mean <60. This indicates statistical reasoning skills is still low. Based on results, the lecturers should be emphasize statistical reasoning on learning process, not only skills and procedures, but students are also able to explain why and how the concepts and ideas of Statistics. One effort that can be done by setting constructivism learning. Of course, a good assessment that can measure students statistical reasoning in Introductory Statistics need to be improved continuously. Also about the only form of multiple choice, need to be made about the description so that the ability of the students can be measured properly.

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## A Study on Students’ Misconception about Chemical Equilibrium Subject at A Senior High School

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**Abstract:** Chemical equilibrium is often considered as one of difficult concepts in chemistry. According to the literatures, most students have different degree of understanding on chemical equilibrium and related topics leads them to misconceptions. The aim of this study is to investigate eleventh grade students’ understanding on chemical equilibrium and on related subject. Diagnostic test containing six multiple choices and four open-ended questions has been developed to investigate students’ misconception on chemical equilibrium and related subjects. The test was examined by two experts for its validity and its alignment to the instructional objectives. The test was distributed to 30 eleventh grade students from a senior high school found in Bandung. The data obtained from multiple choices and open ended questions were analyzed based on students’ understanding criteria of Sound Understanding (SU), Partial Understanding (PU), Specific Misconceptions (SM) and No Response (NR). The Results showed that students still have some misconceptions on definition of equilibrium state, factors affecting Le chateliers principle, relating Kc and Kp values and their expressions, effect of concentration on acid base reaction and common ion effect in equilibrium state, relationship between reaction quotient with equilibrium constant, and equilibrium expression for steps of reaction. Students have these misconceptions due to some possible factors. Such as teachers have lack of information on learners already know and how they acquire knowledge, students’ difficulty on relate the levels macroscopic properties of equilibrium to their sub-microscopic properties.

**Keywords:** Chemical equilibrium, misconception, student’s understanding.

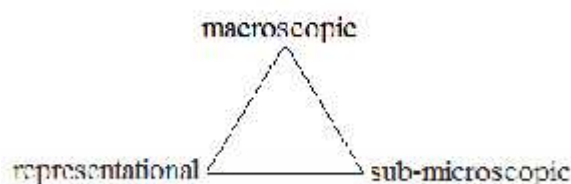
### 1 INTRODUCTION

Misconception is mismatch between what a person knows and what is known to be scientifically correct. It also refers to preconceived notions based on cultural influences or school made. School-made misconceptions are chemical misconceptions which are caused by inappropriate teaching methods and materials (H.Dieter B. et.al.2009). Personal perceptive could cause incorrect understanding of a specific process, concept, or idea is said to be misconception (David C. Swanson, 2011).

A number of literatures have identified common misconceptions held by students at the secondary level. Chemical equilibrium is one of the most difficult topics to learn (Butts & Smith 1987). Chemical equilibrium structures have many basic chemistry concepts which are abstract to understand due to chemistry teachers are not aware of student’s prior knowledge and words used in everyday language have different meanings (Finley et al. 1982;

A.Erdemir. et.al, 2000). According to Johnston (1991) the particular difficulties at secondary schools that cause school-made misconceptions are coming from the transition from the macroscopic level directly to the representational level as shown below. Students can’t identify substances from the macroscopic level with particles from the sub-microscopic level. Determining and overcoming these difficulties should be the primary goal of teaching chemistry (Ghassan Sirhan, 2007).

Fig.1 conceptual understanding of chemistry as learning model



Most students had common misconception on arithmetic relationship between the concentrations of



reactants and products which are concentrations of the reactants and concentrations of the products are equal (Mark W. Hackling A. & Patrick J. Garnett, 2007). This leads to failure to use concentrations (number of moles is used instead) for equilibrium-constant expression. Students believe that mass and concentration mean the same thing for substances in equilibrium systems (M. Kousathana et.al, 2001).

Some students considered that equilibrium constant for the reaction didn't affect with an increase in temperature. They believed that the equilibrium constant has a fixed value and are applying that idea to situations where it is not appropriate. In contrary others considered that the equilibrium constant is greater after increasing the concentration of reactant because this produced an increase in the product concentration (Mark W. Hackling & Patrick J. Garnett, 2007). Errors in the calculation of equilibrium constants had occurred due to the failure to use coefficient in Kc expression. (David C. Swanson, 2011).

Students have confusion on the different between rate reactions with equilibrium reaction as Mark W. Hackling A. & Patrick J. Garnett, (2007) addition of catalyst to equilibrium system affects that the rates of the forward and reverse reactions could be affected differently.

The results of whole studies listed above showed; students had different degree of understanding on different concepts of chemical equilibrium with different backgrounds of students. This study tries to explore the misconceptions of chemical equilibrium in one of senior high school found in Bandung city. It aimed to investigate eleventh grade students' understanding on and also conceptual difficulties on related subjects.

## 2 METHODOLOGY

Indonesia education system has three levels of education which are early childhood education, basic education and secondary education. Early childhood education includes kindergarten, basic education also incorporates elementary school (grade 1-6) and junior secondary school (grade 7-9) whereas secondary school include (grade 10-12), and higher education (university and colleges). Chemistry subject is given as science through integrating with other natural science subjects up to grade nine, but starting from grade ten up to twelve is given independently. The topic of the study I.e. chemical equilibrium is taken in grade eleven.

### 2.1 Sample

The sample under investigation comprised 30 students ranged from age of 16-17 years who are taken from one of senior high schools in Bandung.

The school was selected based on purposive sampling which is one of the levels 'A' in 2014 academic year. All students had included in the study of the topic under investigation at a fundamental level in grade 11.

### 2.2 Instrument

The study was applied chemical misconception test to collect data. Test containing multiple choices and open-ended questions has been developed in English version first and translated in to Bahasa Indonesia with help of two chemistry instructors based on the Indonesian chemistry syllabus to avoid language barrier of students who can understand the items easily. This helps to explore student's misconception on chemical equilibrium and related subjects easily. Multiple choice items were six in number most of them consisting of five distracters with one correct answer and require justification for each answer. Each distracter of an item was prepared in such a way that it was confronted with students' misconceptions. The open ended items had four in number which gives the freedom to write what they have in their mind which supports to dig out their understanding. The items were adapted from literature and designed by the author. The test was examined by two experts both of them have PhD in chemistry education and suggestions on the questions were taken in to consideration; its Content validity and its alignment to the instructional objectives. Moreover the experts were evaluating its affinity to explore misconception of the students on the topic and related topics. Test was also given after eleventh grade students studied the chemical equilibrium topic.

### 2.3 Data Analysis

The data obtained from multiple choices and open ended questions were analyzed based on four categories of students' understanding criteria such as Sound understanding (SU), Partial understanding (PU), Specific Misconceptions (SM) and No Response (NR). According to Abraham et al., 1992; these categories are detailed below.

- Sound Understanding  
Scientifically complete response and correct explanations.
- Partial Understanding  
Responses that included
  - Correct or partially correct explanation with wrong choice
  - Correct choice with wrong explanation.
- Specific Misconceptions:

Responses that included illogical or incorrect information including

- Wrong choice with wrong explanation.
- Correct or incorrect choice without explanation.
- No Understanding: students whose don't choose any response and make any explanations or repeat the question are label in this category

### 3 RESULT AND DISCUSSION

This study focused on the students misconception on chemical equilibrium of senior high school of grade eleven students. The study presented the misconceptions based on the data's obtained from open ended and multiple choice items with percentages of students who have engaged in answering the set questions are discussed in the three tables below.

Table 1 Definition of chemical equilibrium

	Category of students response							
	SU		PU		SM		NR	
	No of sts	%	No of sts	%	No of sts	%	No of sts	%
1	12	40%	10	33.3 %	8	26.7 %	-	-
2	2	6.67 %	4	1.33 %	21	70%	3	10 %

Item -1 which one is *true* about the Equilibrium state?

- A. The state of forward reaction is being faster than the reverse reaction.
- B. Condition at which reaction goes to completion.
- C. Condition at which the concentration of reactants and products equal.
- D. There is no change in chemical reaction.
- E. \*\* Back and forth reactions are constantly happening at an equal rate.

NB \*\* indicates correct answer of the item.

Item one investigates whether or not students could distinguish between reactions that go to completion and reversible reactions; may believe that the forward reaction goes to completion before the reverse reaction commence. The student responses of in each category for item one is shown in the table above, 40% of students responded in the category of *sound understanding*, 33.3% of them responded in that of *partial understanding* and 26.7% of them responded in that of *specific misconception*. Students whose answers were sorted in category of sound understanding defines the equilibrium is a dynamic process and explains that equilibrium occurs for reversible reactions when the forward and reverse reactions rates are equal and there is no net conversion of reactants to products. The equilibrium

reactions do not go to completion, all species from reactants and products exist at equilibrium.

Students who have categorized as partial understanding; equilibrium state is a condition of rate of forward and reversible reactions are equal in which reactants are consumed to products at the same time reversed in to products but it isn't the same as reactants transformed to products.

Students whose answers were sorted in category of specific misconception; incorrectly defines equilibrium state with scientifically unacceptable reason are listed below.

"Equilibrium state is a condition at which the concentration of products and reactants are equal. Due to this reason during chemical equilibrium no compositional change did occur i.e. physical change as a result no chemical reaction happened during reversible reaction. And others considered that the reaction goes to completion from reactant to products, but forward reaction goes to completion before the reverse reaction begins. In addition forward and reverse reactions are like weighing balance which has equal amount of the species comparing with the standard."

The conceptual difficulty about the state of equilibrium might be due to unable to recognize the definition which states that it is equal rate of forward and reverse reactions directly related with daily life of students of weighing, balancing and stability. This is the same with A.Erdemir.et.al (2000). Students had misconceptions in chemical equilibrium due to everyday terms such as equal, balanced are used in statements of equilibrium stated. Likewise during equilibrium condition reaction is not going to completion, this also leads them to conclude it is a physical change no compositional structure alters. Moreover the mis understanding of forward reaction goes to completion before the reverse reaction begins, is take place because of considering it undergoes in separated system rather than in closed system. Similar misconception have been reported by Gussarsky and Gordetsky, (1990) Secondary school students could hardly understand the dynamic nature of chemical equilibrium.

Item -2- in a closed system, the following equilibrium can develop between the compounds  $\text{PCl}_5$ ,  $\text{PCl}_3$ , and  $\text{Cl}_2$ .



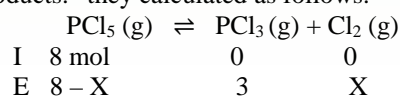
At the beginning of the reaction 8 mol of  $\text{PCl}_5$  are present, at this time  $\text{PCl}_3$  and  $\text{Cl}_2$  have not yet been formed. At equilibrium, 3 mol of  $\text{PCl}_3$  are formed. How many moles of  $\text{PCl}_5$  and  $\text{Cl}_2$  exist at equilibrium?

- A. 2 mol of  $\text{PCl}_5$  and 3 mol of  $\text{Cl}_2$
- B. 3 mol of  $\text{PCl}_5$  and 3 mol of  $\text{Cl}_2$
- C. 4 mol of  $\text{PCl}_5$  and 1 mol  $\text{Cl}_2$
- D. \*\* 5 mol of  $\text{PCl}_5$  and 3 mol of  $\text{Cl}_2$

E. 6 mol of  $\text{PCl}_5$  and 3 mol of  $\text{Cl}_2$ .

Item two examined whether the students have the misconception of equilibrium state means having an equal amount of concentration of reactants and products as well to differentiate equal rate and equal concentration of species.

As seen in table one above, 6.67% of students responded in the category of sound understanding, 1.33% of them responded in that of partial understanding, 70% of them responded in that of specific misconception, and 10% of them responded in that of no response. Students whose answers were sorted in category of sound understanding calculate the number of moles in equilibrium which is “not necessary to have equal number of moles of reactants and products.” they calculated as follows:



Since the coefficient of the species is the same, reversible reaction decomposes with equal rates, and then  $\text{PCl}_3$  and  $\text{Cl}_2$  have 3 moles each. whereas  $\text{PCl}_5$  8 mol - 3mol = 5 mol of  $\text{PCl}_5$ . Students whose categorized as partial understanding had explained that decomposition reaction of  $\text{PCl}_5$  completely transformed in to products of  $\text{PCl}_3$  and  $\text{Cl}_2$ . At equilibrium reaction Zero mole of  $\text{PCl}_5$ , 4 moles of  $\text{PCl}_3$  and 4 moles of  $\text{Cl}_2$ , formed from 8 mole of  $\text{PCl}_5$ .

Students whose answers were sorted in category of specific misconception; response with scientifically unacceptable reason are listed below.

“Total amount of species are the same on both sides of reaction which is 6 moles  $\text{PCl}_5$  is equals to the sum of 3 moles of  $\text{PCl}_3$  and 3 moles of  $\text{Cl}_2$ . In addition equilibrium  $\text{PCl}_3$  has 3moles while  $\text{Cl}_2$  the same number of coefficients which has 3 mole followed by sum of products become 6 moles. In the beginning of reaction  $\text{PCl}_5$  has 8 moles, then subtract it by total numbers of moles of products (8 mol-6mol = 2 mole). Moreover others also responded that in equilibrium, the amounts of species are the same. It has to be 3 moles of  $\text{Cl}_2$ ,  $\text{PCl}_3$  and  $\text{PCl}_5$  each. Equilibrium is occurred when the same amount exists on both sides of reactions.”

Students who have such misconception might be resulted from the definition of equilibrium which is rate of forward and reverse reactions are equal. Then the  $K_{eq}$  is calculated from the concentration of products and reactants thus if there are equal concentrations  $K_{eq}$  will be 1. Here students forget that  $K_{eq}$  is dependent neither concentration of product nor reactant. This is analogues to the literature by Mark W. Hackling A. & Patrick J. Garnett, (2007) which said most students had common misconception on the arithmetic relationship between the concentrations of reactants and products which are concentrations of the

reactants and concentrations of the products are equal; the misconception was obviously due to consideration of the coefficients in the chemical equation. This misconception gives to the considerable emphasis placed on reaction stoichiometry in introductory chemistry topics

Table 2 Applying Le Chateliers principle to predict direction of equilibrium to acid-base equilibria and common ion effect

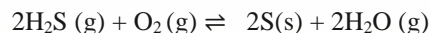
	Category of students response							
	SU		PU		SM		NR	
	No of sts	%	No of sts	%	No of sts	%	No of sts	%
3	-	-	2	6.67 %	27	90%	1	3.33%
4	1	3.33 %	2	6.67 %	27	90%	-	-
5	-	-	10	33.3 %	17	56.7 %	3	10%
6	2	6.67 %	11	36.6 %	15	50%	2	6.66%

Item-3 which of the following systems at equilibrium could be affected by changing the volume of container?

- $2\text{CrO}_4^{2-}(\text{aq}) + 2\text{H}^+(\text{aq}) \rightleftharpoons \text{Cr}_2\text{O}_7^{2-}(\text{aq}) + \text{H}_2\text{O}(\text{l})$
- $\text{FeO}(\text{s}) + \text{CO}(\text{g}) \rightleftharpoons \text{Fe}(\text{s}) + \text{CO}_2(\text{g})$
- $\text{SO}_2(\text{g}) \rightleftharpoons \text{S}(\text{s}) + \text{O}_2(\text{g})$
- $2\text{H}_2\text{S}(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{S}(\text{s}) + 2\text{H}_2\text{O}(\text{g})$
- Neither of them could be affected.

To look over students understanding about at what position changing volume of container can affect direction of equilibrium and further the relationship between partial pressure and volume in changing the position of equilibrium.

As seen in table two above, 6.67% of students responded in the category of partial understanding, 90 % of them responded in that of specific misconception, and 3.33% of them responded in that of no response. Students whose answers were sorted in category of partial understanding “The reactions containing substances in the form of pure liquid and solid have less effect on the position of the equilibrium because it has occupied less space than gaseous state. More over they believed volume of container affects only if excess water molecules presence in the equilibrium reaction.” They choice the reaction of



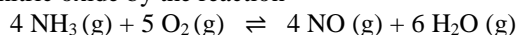
Students whose answers sorted in category of specific misconception; incorrectly explains the

effects of volume on equilibrium position with scientifically unacceptable reason are listed below

“When volume of the container increases the amount of substance also increases then equilibrium will shift to greater amount of moles. Moreover others responded that changing volume of container couldn't affect direction of equilibrium, a container is a place where the reaction occurs thus it couldn't have any influence in the given chemical reaction however factors such as pressure can affect the equilibrium.”

The students who have misconception on effect of volume on equilibrium might be coming from lack of prior knowledge of Avogadro's law which can relate mole and volume as stated in literature of A.Erdemir. et.al, (2000) chemistry teachers are not aware of student's prior knowledge and a common conceptual error thus causes some misconceptions regarding chemical equilibrium. According to Avogadro's law, the number of moles is directly proportional to the volume of the gas. There are 3 volumes (1 vol + 2 vol) on the reactant side and 2 volumes on the product side. The increase in pressure always affects the side that has more volume, and mainly they gave emphasis to physical behavior of gases not to the chemical property of the equilibrium caused by the change in physical behavior.

Item - 4 - In the first step of the Ostwald process for the synthesis of nitric acid, ammonia is oxidized to nitric oxide by the reaction



$\Delta H = -901.2 \text{ KJ}$  which of the following is correct alternative?

- Removing the concentration of  $\text{NH}_3$  shift the direction of equilibrium to right
- Adding Helium gas will shift the direction towards right.
- Addition of platinum-rhodium catalyst will proceed to form more concentration of  $\text{NO}$ . Decreasing pressure shifts the direction of equilibrium towards left.
- \*\* Increasing temperature leads to decrease equilibrium constant  $K_c$ .

To investigate students misconception on Le Chateliers Principle which is useful in predicting how a system at equilibrium will respond when certain changes are imposed?

To show effect of changing the concentration of a reactant or product, addition of catalyst, changes partial pressure of gases in direction of chemical equilibrium, and changing the temperature in  $K_c$  value.

As seen in table two above, 3.33% of students responded in the category of sound understanding, 6.67% of them responded in that of partial understanding, and 90% of them responded in that of specific misconception. Students whose answers were sorted in category of sound understanding

clearly stated how an equilibrium can be minimized which is disturbed by changing concentration, temperature and pressure, where the stress is diminished. However adding catalyst couldn't affect the position of equilibrium simply affects speed of both forward and reverse reaction in the same way. Moreover the value of  $K_c$  primarily depends on temperature; this reaction is exothermic reaction increasing temperature leads to decrease equilibrium constant  $K_c$  using van't Hoff equation. Students who were categorized under partial understanding explained that the position of equilibrium is affected by the add/remove concentrations and temperature, but they didn't explained it well. One of the students clarified their reason as follows: “While the reaction is exothermic reaction, as the temperature increases the equilibrium shifts in to left direction to minimize the stress of product side. This affects to increase concentration of reactants which leads to decrease value of  $K_c$ . Moreover addition of Pt-Rh catalyst speeded up the reaction and made it to increase the concentration of reactant and shift the equilibrium towards product side.”

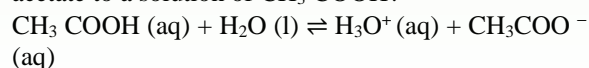
Students whose answers were sorted in category of specific misconception; incorrect conception or erroneous on Le chateliers principle with scientifically unacceptable reason are listed below.

- “Adding Helium gas affects to increase concentration of  $\text{O}_2$  which shifts direction of equilibrium to right.
- Addition of catalyst speeded up forward reaction that can form more concentration of nitrogen monoxide  $\text{NO}$ .
- Removing concentration of  $\text{NH}_3$  considers transforming to form new product that's why removing  $\text{NH}_3$  shift to right.
- Decreasing pressure shifts the direction of equilibrium towards left, because the reaction is exothermic; the product side has more heat stress thus to minimize the stress the reaction shift to left.
- Students were also found to possess about an increase in temperature always increases the value of the equilibrium constant for both exothermic and endothermic reaction.”

Students who have conceptual difficulty on  $K_c$  value it arises from inferring Le Chateliers principle using the rate reaction and thus confuse the rate and the extent of a reaction. Similar literature was studied by Anil C. Banerjee, (1991) Students and teachers believe that increasing the temperature in an exothermic reaction would decrease the rate of the forward reaction. Whereas the conceptual difficulties on effect of catalyst coming from adding catalyst only affects forward reaction which is also explained using the concept of rate of reaction, and as in item one explained above they believe that the forward and reverse reaction is occurred in different systems

this is the same as literature by Mark W. Hackling A. & Patrick J. Garnett, 2007 addition of catalyst to equilibrium system with the notion that the rates of the forward and reverse reactions could be affected differently. This probably reflects incomplete understanding by students of the existence of a common reaction pathway and transition state for the forward and reverse reactions. For those who have difficulty on addition of noble gases can undergo chemical reaction might arise from lack of knowledge about properties and stabilities of noble gases are chemically inactive or considered gases have affected by change in pressure.

Item-5- What is the effect of adding sodium acetate to a solution of CH<sub>3</sub>COOH?



To explore the students' conception in relating stress of concentration with the concept of common ion effect describes the effect on a solution of two dissolved solutes that contain common ion.

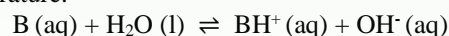
As seen in table two above, 33.3% of students responded in the category of partial understanding, 56.7% of them responded in that of specific misconception, and 10% of them responded in that of no response. Students whose answers sorted in category of partial understanding have responded adding sodium acetate to aqueous acetic acid caused to increase the concentration of acetate ion which has more stress in right direction, to minimize the stress the reaction shifts to left direction, and then increases value of K<sub>c</sub> because there is less concentration of reactants than concentration of products. Students whose answers were sorted in category of specific misconception had responded as follows. One of the student responses in this category is

- There is no sodium acetate substance in the reaction thus adding sodium acetate has no effect on the equilibrium reaction. It is spectator substance; no change can cause acetic acid.
- Aqueous of CH<sub>3</sub>COONa has acetate ion which can cause to increase the concentration of CH<sub>3</sub>COOH; as a result the equilibrium will shift to product side.
- It causes to increase concentration of H<sub>3</sub>O<sup>+</sup> which leads to increase dissociation of acetic acid.
- Excess concentration of H<sub>3</sub>O<sup>+</sup> react with CH<sub>3</sub>COO<sup>-</sup> then the equilibrium will shift to left direction.

This difficulty of students on the relating both common ion effect and Le chateliers principle might arise from lack of knowledge of dissociation of ionic compounds. They didn't really understand ions formed from dissociation of sodium acetate which can affect the dissociation of acetic acid. As the same time they considered that effect of concentration in

Le chateliers principle is only to the same molecule/compound not the common ion. In this case acetate ion is a common ion because it is "common" to both the acetic acid and sodium acetate solutions; that is, acetate ion from the acid enters a solution in which it is already present. The common-ion effect occurs when a given ion is added to an equilibrium mixture that already contains that ion, and the position of equilibrium shifts away from forming more of it.

Item - 6 - Consider the following reversible reaction in a state of equilibrium at a constant temperature.



When aqueous HCl is added to the equilibrium reaction what will happen to OH<sup>-</sup> concentration?

This item investigates students' misconception how Le chateliers principle could relate with acid base equilibria. As seen in table two above, 6.67% of students responded in the category of sound understanding, 36.67% of them responded in that of partial understanding, 50% of them responded in that of specific misconception, and 6.66% of them responded in that of no response. Students whose answers have sorted in category of sound understanding stated that when aqueous HCl acid is added, it produces hydronium ion to the system then H<sub>3</sub>O<sup>+</sup> reacted with OH<sup>-</sup> to form water; more OH<sup>-</sup> is consumed, to reestablish the equilibrium it shifts towards right side. Students who have partial understanding, responded as concentration of OH<sup>-</sup> decrease because OH<sup>-</sup> react with H<sup>+</sup> as result OH<sup>-</sup> is consumed but the equilibrium shifts to left direction to produce more water.

Students whose answers were sorted in category of specific misconception couldn't relate the acid base reaction with Le chateliers principle. Mostly students are familiar with effect of concentration in direction of equilibrium if the stress is coming from the same substance, but not in acid base reaction. Some of the respondents' reasons are listed below:

- Addition of HCl causes an increase concentration of H<sub>2</sub>O and water ionizes in to more OH<sup>-</sup>.
- Students thought that there are no hydroxide ions in an aqueous solution of hydrochloric acid in distilled water because the students failed to recognize the presence of the vital equilibrium present in aqueous ionic solutions.
- Concentration of OH<sup>-</sup> is constant because there is no OH<sup>-</sup> concentration in aqueous HCl.
- Addition of HCl doesn't affect system of equilibrium. While no HCl concentration in the reaction at all, thus OH<sup>-</sup> is constant.

The students have difficulty in acid base equilibria is the same as in common ion effect those realized that change in concentration could affect the equilibrium state if the same substance is present in the reaction

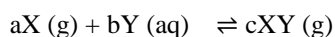
otherwise acid base reaction couldn't relate with the Le Chateliers principle. This is arising from lack of

	Category of students response							
	SU		PU		SM		NR	
	No of sts	%	No of sts	%	No of sts	%	No of sts	%
7	5	16.67%	2	6.67%	23	76.66%	-	-
8	-	-	8	26.66%	20	66.67%	2	6.67%
9a	2	6.67%	5	16.66%	20	66.67%	3	10%
9b	2	6.67%	9	30%	17	60%	2	6.67%
10	-	-	8	26.66%	20	66.67%	2	6.67%

knowledge of dissociation of aqueous acid/ base which can produce hydronium or hydroxide ion. Similarly it can be occur due to lack of practical works in chemistry it hinders interest of students as well as conceptual understanding. When well planned and effectively implemented, practical work is applied it can stimulates and engages students' learning at varying levels of inquiry challenging them both mentally and physically.

Table 3 Equilibrium constant expressions and Le chateliers principle

Item-7-In the reaction of “X” gas and “Y” aqueous gives “XY gas compound” at a constant temperature.



To have greater value of equilibrium concentration constant Kc than equilibrium partial pressures of Kp, the value of the coefficients should be?

- Number of moles of product is less than number of moles of reactants ( $C < a + b$ )
- Number of moles of product is equals to number of moles of reactants ( $a + b = C$ )
- Number of moles of product is greater than number of moles of reactants ( $C > a + b$ )
- Number of moles of product and reactants couldn't say ant thing about Kc and Kp.

To explore students' misconception about relationship between Kc the equilibrium values expressed as concentrations and Kp the equilibrium values expressed as partial pressure through the mathematical formulas of the constant value of Kc with Kp.

As seen in table three above 16.7% of students responded in the category of sound understanding, 6.67% of them categorized in partial understanding, 76.7%of them responded in that of specific misconception. Students whose answers were sorted in category of sound understanding clearly put the formula of Kc related with Kp;  $K_p = K_c (RT)^{c - (a + b)}$  prove from idea gas law; in which Kc has greater value than equilibrium partial pressure Kp while number of moles of gaseous reactants are greater than number of mole of gaseous product.

Students whose responses were categorized as partial understanding put the mathematical formula of  $K_p = K_c (RT)^{\Delta n}$  however they didn't elaborated how Kc can be greater than Kp.

As a result Kc has greater value than equilibrium partial pressures of Kp. Some of the students whose answers were sorted in category of specific misconception clarified their responses as listed below.

The constant values of Kp and Kc couldn't compare through coefficients of products and reactants. Because the values of those constant values are depend on temperature not in coefficient of products and reactants. Other respondents said that while number of moles of product are greater than to number of moles of reactants ( $a + b < C$ ) the Kc has greater value than Kp because the reactant occurred in aqueous is not included in calculating sum of moles of reactants. Simply counting the number of species of reactant and products in the chemical reaction, which has two numbers of reactants (X and Y), and one product are found in the reaction, there is more number of reactants than product.

Students whose faced difficulty to relate the formula of Kc and Kp might arise from lack of knowledge about the equation of idea gas law,  $VP = nRT$  and stoichiometry reaction relation of products and reactants. As model learning of chemistry stated by Johnston, 1991 and Gabel, 1993 Chemical knowledge is learned at three levels: “sub-microscopic,” “macroscopic “and “symbolic”, and the link between these levels should be clearly taught and also the interactions and distinctions between them are important characteristics of chemistry learning and necessary for achievement in comprehending chemical concepts. Therefore, if students possess difficulties at one of the levels, it may influence the other. Students have a problem in symbolic part which explains about equation. As the model of learning explains as one corner of the triangular relation missed the other corners would missed too. The mathematical formula of the ideal gas law is categorized under “representational” corner of a triangle without these corner students unable to understand the macroscopic and sub-microscopic concepts well.

Item- 8 - A 5.0 L flask is filled with 0.25 mol of  $\text{SO}_3$ , 0.50 mol of  $\text{SO}_2$ , and 1.0 mol of  $\text{O}_2$ , and allowed to reach equilibrium. At constant temperature, equilibrium Constant  $K_c$  is 0.12. To achieve equilibrium by using reaction quotient  $Q$ , which one is **correct** about the effect on the concentration of  $\text{SO}_3$ ?

- $2\text{SO}_3(\text{g}) \rightleftharpoons 2\text{SO}_2(\text{g}) + \text{O}_2(\text{g})$
- Decreases concentration of  $\text{SO}_3$
  - \*\*Increases concentration of  $\text{SO}_3$
  - Concentration of  $\text{SO}_3$  as it is

To explore whether students could have misunderstanding on the effect of concentration in position of equilibrium by associating concepts of reaction quotient and equilibrium-constant.

As seen in table three above, 26.66% of students replied in the category of partial understanding, 66.67% of them responded in that of specific misconception, and 6.67% of them in that of no response.

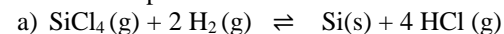
Students whose answers were sorted in category of partial understanding calculated the value of  $Q$  by converting the amount of mole to molarity, however failed how the reaction can become at equilibrium using concentration of  $\text{SO}_3$  whereas students whose answers sorted in category of specific misconception confused with the amount (moles) and concentration (molarity). They didn't convert the given moles to molarities which calculated the value of  $Q$  directly from the amount of moles than molarity. They have calculated following this procedure the value of  $Q$  became 4 which is greater than value of  $K_c$  thus to achieve equilibrium the concentration of  $\text{SO}_3$  required increasing until value of  $Q$  and  $K_c$  are equal. In addition other respondents calculated the value of  $Q$  without using coefficients still value of  $Q$  i.e. 0.2 is greater than  $K_c$  (0.12) then to reach at equilibrium needed to raise concentration of  $\text{SO}_3$ . One of the student responses in this category is:

"Both reaction quotient and equilibrium constant are the same, it didn't depend on initial concentration like  $[\text{SO}_3]$ ; primarily depend on temperature thus Concentration of  $\text{SO}_3$  will remain the same. Other respondents replied while Concentration of  $\text{SO}_3$  is raised  $Q$  will be less than  $K_c$  most of the students here mislead by calculating the concentration without converting the moles to molarity. The equilibrium system will shift to overcome the change finally more product will be produce which can increase value of  $Q$  than  $K_c$ . In addition when  $\text{SO}_3$  is more concentrated it caused a stress in left side of reaction then value of  $Q$  will be raised because of equilibrium system shifts to right to encounter the stress."

Students have the difficulty on the effect of change in concentration on the reaction quotient value with equilibrium constant is mainly arises from unfamiliarizing the formula of concentration

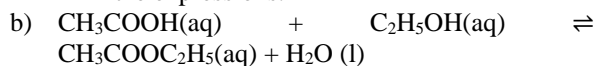
expressed by molarity and considering reaction quotient is not also depend on concentration like equilibrium constant values. In contrary A.Erdmir.et.al, (2000) claimed that Students solve problems successfully solving mathematical problems without understanding the chemical concepts behind their memorized algorithmic solutions. However in this study students have both mathematical and understanding the chemical concepts problems. Those who have calculated the value of  $Q$  without using coefficients might come from failed to use stoichiometrically relations of products and reactants. This is in analogues with the finding of David C. Swanson, (2011) mostly fundamental errors in the calculation of equilibrium constants had occurred due to the failure to use coefficients in  $K_c$  expression.

Item -9- Write expression of  $K_p$  and  $K_c$  for the following reversible reactions at equilibrium with constant temperature.



This is to investigate students understanding on expression of  $K_c$  equilibrium values expressed as concentrations and  $K_p$  equilibrium values expressed as partial pressures. As seen in table three above, 6.67% of the students have sound understanding that articulated the  $K_p$  and  $K_c$  correctly, expressed the equilibrium constants by excluding the solid concentration of silicon. Solid species couldn't include in the  $K_p$  and  $K_c$  expressions because, concentration of pure liquid and pure solid is equal to one so do not include pure solid or pure liquid in equilibrium expression. Only include gases and dissolved species that are in solution. 16.67% of them have partial understanding who expressed the  $K_p$  or  $K_c$  expressions correctly with wrong explanations and 66.67% of the respondents had specific misconception and 10% of students had no response. Students' misconception about  $K_p$  expression elaborated as follows:

- They didn't include the coefficients of hydrogen and  $\text{HCl}$  in the expression.
- Include the concentration of solid silicon in the expressions.



6.67% of the students have sound understanding that expressed the constant  $K_p$  correctly, by excluded the liquid concentration of water, 30% of them were responded under partial understanding, 60% of them have specific misconception and 6.67% with no response. Some of the students' explanation and expressions are written as follows:

- Impossible to express  $K_p$  because of two reasons first none of the species are in gas phase. The partial pressure is only includes

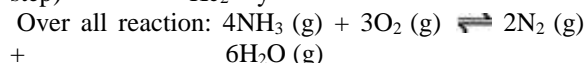
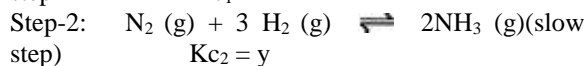
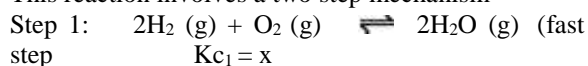
the species with gaseous phase. But here the species are aqueous and liquid. The second reason was liquid species which couldn't include in expression. They considered that aqueous phases are the same as liquid reactant.

- Involve all concentrations including pure liquid water in expression of Kc.

The difficulty of the students in Kp expression is due to lack of understanding of how products and reactants are stoichiometrically related which stoichiometry must be considered when forming the equilibrium equation. Likewise fundamental errors in the calculation of equilibrium constants had occurred due to the failure to use coefficients in Kc expression (David C. Swanson, 2011).

Item -10- Consider the reaction between NH<sub>3</sub> and O<sub>2</sub> to form N<sub>2</sub> and H<sub>2</sub>O

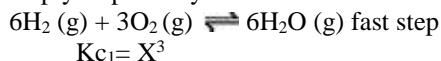
This reaction involves a two step mechanism



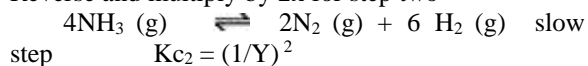
Write the Kc expression of the overall reaction.

As table three above, students' response to the expression of equilibrium constant to steps of reaction were; 26.66% of the respondents had partial understanding, they found Kc of overall reaction, however they didn't explain why they followed such way to calculate Kc.

Multiply step one by 3X



Reverse and multiply by 2x for step two



equilibrium constant for the overall reaction is the equilibrium constants for the elementary steps

$$K_c = K_{c1} \times K_{c2} = X^3 \cdot (1/Y)^2$$

66.67% of them had specific misconception and 6.67% of them no response. Students who have partial understanding claimed Kc expressed using the slowest step. The slowest step is used to determine Kc like rate law, expressed as follows

$$K_c = \frac{[\text{N}_2]^2 [\text{H}_2]^6}{[\text{NH}_3]^4}$$

However other respondent's stated equilibrium constant expression is expressed by using the overall reaction, because the overall reaction has an average speed of both fast and slow reactions. They expressed as follows:

$$K_c = \frac{[\text{N}_2]^2 [\text{H}_2\text{O}]^6}{[\text{NH}_3]^4 [\text{O}_2]^3}$$

Students with specific misconception expressed Kc equilibrium express the using the overall reaction by neglecting the elementary steps.

$$K_c = \frac{[\text{H}_2\text{O}]^6 [\text{N}_2]^2}{[\text{NH}_3]^4 [\text{O}_2]^3}$$

The student's difficulty in this item is unable to differentiate the rate (how fast) and extent (how far) of reaction simultaneously. Equilibrium applies to the extent of a reaction, the concentration of product that has appeared after an unlimited time, or once no further change occurs. Rate reaction applies to the speed of a reaction, the concentration of product that appear (or of reactant that disappears) per unit time. Just as reactions vary greatly in their speed, they also vary in their extent. A fast reaction may go almost completely or barely at all toward products. In the step of reaction the slowest step is the rate determining step, however for equilibrium constant first obtain the expression for the overall reaction combine the expressions for the individual steps. That is, overall reaction is the sum of two step reactions, and then overall equilibrium constant is the product of the equilibrium constants for the steps (fast and slow reactions).

## 4 CONCLUSION

Acknowledgements should be placed before the references section. Numbering is not necessary.

From the analyses of students' responses of the diagnostic test, it can be concluded that students have misconceptions in different areas of chemical equilibrium related topics, some of these misconceptions are parallel to those in the literature and others are identified by this study. The most significant misconceptions revealed by this study were:

- Equilibrium state is a condition at which the concentration of products and reactants are equal.
- The reaction goes to completion from reactant to products, but forward reaction goes to completion before the reverse reaction begins.
- When volume increases the amount of substance also increases then equilibrium shifts to greater amount of moles.
- Changing volume of container couldn't affect direction of equilibrium; a container is a place where the reaction occurs thus it couldn't have any influence in the given chemical reaction.
- Addition of noble gases can affect the concentration of gaseous species which can shift the reaction to the direction of the stress can be minimized.
- Addition of catalyst speeded up forward reaction that can form more concentration of product.



- An increase in temperature always increases the value of the equilibrium constant for both exothermic and endothermic reaction.
- Addition of common ion to a reaction has no effect on the equilibrium reaction. It is spectator substance; no change can be caused.
- Addition of acid to a reaction which has OH<sup>-</sup> does not affect system of equilibrium.
- The constant values of K<sub>p</sub> and K<sub>c</sub> couldn't compare through coefficients of products and reactants. Because the values of the constant values are depend on temperature not in coefficient of products and reactants.
- Both reaction quotient and equilibrium constant are the same, it didn't depend on initial concentration; primarily depend on temperature.
- Express K<sub>p</sub> only includes the species with gaseous phase not aqueous phase.
- For steps of reaction K<sub>c</sub> expressed by the slowest step similar to rate law expression.

The researcher suggests that the study should be conducted in different senior high schools found in the city with different instruments to collect validated data overall it will full and better work. Moreover exploring pedagogical content knowledge of chemistry teachers will also help to know the basis of the problem and to solve it at hand. For those who will desired to study in this area should investigate on how those already identified misconceptions can be overcome for quality and better chemistry teaching in class room.

## 5 ACKNOWLEDGEMENT

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**Appendix: Chemical equilibrium conceptual test**

**Instructions:**

- Thank you for your willingness to fill the questions
- No need of writing your name, but write your school name.
- Questions require you to circle for multiple choice answers and a reason out for your answer.
- Remember that more than one answer may be correct.

Name of school \_\_\_\_\_  
Age \_\_\_\_\_ sex \_\_\_\_\_

Item -1 which one is true about the Equilibrium state?

- The state of forward reaction is being faster than the reverse reaction.
- Condition at which reaction goes to completion.
- Condition at which the concentration of reactants and products are equal.
- There is no change in chemical reaction.
- \*\* Back and forth reactions are constantly happening at an equal rate.

Answer \_\_\_\_\_  
Reason out \_\_\_\_\_

Item -2 in a closed system, the following equilibrium can develop between the compounds  $PCl_5$ ,  $PCl_3$ , and  $Cl_2$ .



At the beginning of the reaction 8 mol of  $PCl_5$  are present, at this time  $PCl_3$  and  $Cl_2$  have not yet been formed. At equilibrium, 3 mol of  $PCl_3$  are formed. How many moles of  $PCl_5$  and  $Cl_2$  exist at equilibrium?

- 2 mol of  $PCl_5$  and 3 mol of  $Cl_2$
- 3 mol of  $PCl_5$  and 3 mol of  $Cl_2$
- 4 mol of  $PCl_5$  and 1 mol  $Cl_2$
- \*\* 5 mol of  $PCl_5$  and 3 mol of  $Cl_2$
- 6 mol of  $PCl_5$  and 3 mol of  $Cl_2$

Answer \_\_\_\_\_  
Reason out \_\_\_\_\_

Item-3 which of the following systems at equilibrium could be affected by changing the volume of container?

- $2CrO_4^{2-}(aq) + 2H^+(aq) \rightleftharpoons Cr_2O_7^{2-}(aq) + H_2O(l)$
- $FeO(s) + CO(g) \rightleftharpoons Fe(s) + CO_2(g)$

- $SO_2(g) \rightleftharpoons S(s) + O_2(g)$
- \*\*  $2H_2S(g) + O_2(g) \rightleftharpoons 2S(s) + 2H_2O(g)$
- Neither of them could be affected.

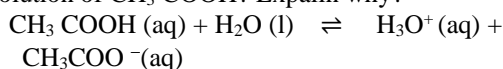
Answer \_\_\_\_\_  
Reason out \_\_\_\_\_

Item - 4 - In the first step of the Ostwald process for the synthesis of nitric acid, ammonia is oxidized to nitric oxide by the reaction  $4 NH_3(g) + 5 O_2(g) \rightleftharpoons 4 NO(g) + 6 H_2O(g)$   $H^\circ = -901.2 kJ$  which of the following is correct alternative?

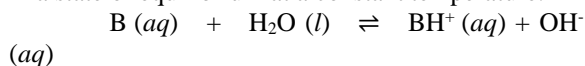
- Removing the concentration of  $NH_3$  shift the direction of equilibrium to right.
- Adding Helium gas will shift the direction towards right.
- Addition of catalyst will proceed to form more concentration of  $NO$ .
- Decreasing pressure shifts the direction of equilibrium towards left.
- \*\* Increasing temperature leads to decrease equilibrium constant  $K_c$ .

Answer \_\_\_\_\_  
Reason out \_\_\_\_\_

Item-5- What is the effect of adding sodium acetate to a solution of  $CH_3COOH$ ? Explain why?

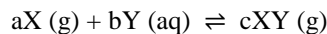


Item - 6 - Consider the following reversible reaction in a state of equilibrium at a constant temperature.



When aqueous  $HCl$  is added to the equilibrium reaction what will happen to  $OH^-$  concentration? Explain why?

Item-7-In the reaction of "X" gas and "Y" aqueous gives "XY" gas compound" Keep constant temperature.



To have greater value of equilibrium concentration constant  $K_c$  than equilibrium partial pressures of  $K_p$ ; the value of the coefficients should be?

- \*\* Number of moles of product is less than number of moles of reactants ( $C < a + b$ )
- Number of moles of product is equals to number of moles of reactants ( $a + b = C$ )
- Number of moles of product is greater than number of moles of reactants ( $C > a + b$ )
- Number of moles of product and reactants couldn't say anything about  $K_c$  and  $K_p$ .

Answer \_\_\_\_\_  
Reason out \_\_\_\_\_

Item- 8 - A 5.0 L flask is filled with 0.25 mol of SO<sub>3</sub>, 0.50 mol of SO<sub>2</sub>, and 1.0 mol of O<sub>2</sub>, and allowed to reach equilibrium. At constant temperature, equilibrium Constant K<sub>c</sub> is 0.12. To achieve equilibrium by using reaction quotient Q, which one is correct about the effect on the concentration of SO<sub>3</sub>?

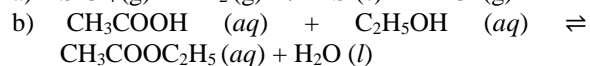
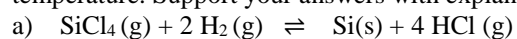


- A. Decreases concentration of SO<sub>3</sub>
- B. \*\*Increases concentration of SO<sub>3</sub>
- C. Concentration of SO<sub>3</sub> as it is

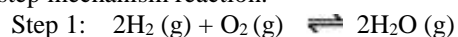
Answer \_\_\_\_\_

Reason out \_\_\_\_\_

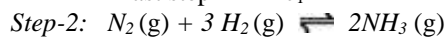
Item - 9 - Write expression of K<sub>p</sub> and K<sub>c</sub> for the following reversible reactions at constant temperature. Support your answers with explanation.



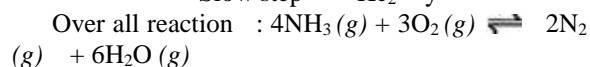
Item -10 - Consider the reaction between NH<sub>3</sub> and O<sub>2</sub> to form N<sub>2</sub> and H<sub>2</sub>O. This reaction involves a two step mechanism reaction.



Fast step K<sub>c1</sub> = x



Slow step K<sub>c2</sub> = y



Write the K<sub>c</sub> expression for the overall reaction.

## The Development of Experiential Learning Model in Entrepreneurship Course

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**Abstract:** Unemployment rate in Indonesia is increasing from time to time. One of the efforts to support job creation is by encouraging entrepreneurial interest among youngsters. Educational institution has the power of doing so by delivering entrepreneurship course. However, entrepreneurship education cannot be delivered by only giving theory in class but also by giving students experience on how they do their business or what we call a field practice. Therefore, an experiential learning model that could increase student interest in entrepreneurship is needed. The objectives of this research are to understand and to analyze 1) student typology 2) student interest on entrepreneurship before the implementation of experiential learning model and 3) to develop experiential learning model in entrepreneurship course. Research method used is Research and Development. The sample of this research is students who enroll entrepreneurship course in Management and Sociology Education Study Program, total of 165 students. The research shows that majority of students of Sociology Education Study Program are scholars while the majority of students of Management Study Program belong to Social Group as well as Creative Individualist. Student interest on entrepreneurship in both study program shows the similar result and it is considered not that high, with the highest index is on self efficacy while the lowest one is on feasibility dimension. It is needed to improve the syllabus of entrepreneurship course by concluding not only theory but also entrepreneurship field practice for students so that students will have an experience on how to run the business.

**Keywords:** experiential learning model, entrepreneurship, student intention

### 1 INTRODUCTION

According to Central Statistics Agency (BPS –*Biro Pusat Statistik*), in 2010, the unemployment rate in Indonesia reached 7.14% or 8.3 million of 116.5 million workforce. The number released by BPS, according to some observers, is actually undervalued. It means that the number is far greater because some indicators are not included. For instance, informal workers that are actually looking for work are considered as employed. The high unemployment rate in Indonesia is caused by several factors such as low levels of education, health, and lack of employment. The lack of employment is the most influential causes of unemployment and poverty. This is triggered by a lack of creativity and independence of the community to create jobs. They always depend on jobs availability. However, the available jobs will not always be able to accommodate the whole workforce because the labor force is higher than the labor need.

McClelland, a scientist from the United States (US), concludes that a country can be said prosperous

when it at least has a number of entrepreneurs as much as two percent of the population. According to the Minister of Cooperatives and Small-and-Medium Enterprises, Syarifuddin Hasan, the number of entrepreneurs in Indonesia in 2011 is only about 0.24 percent of the total population of about 238 million. The number is lower than the number of entrepreneurs in several other countries with high economic growth rates, such as the United States (11 percent), and developing country, such as Singapore (7 percent) and Malaysia (5 percent). The more surprising data came from BPS. It shows that the number of new entrepreneurs is only 0.18% of the total population of Indonesia. The figure is lower than the data sourced from the Ministry of Cooperatives and Small-and-Medium Enterprises ([www.kompas.com](http://www.kompas.com)).

The low number of entrepreneur in Indonesia is pushing the government to continue to make breakthrough in developing entrepreneurship activity. One of the efforts is the National Entrepreneurship Movement (GKW –*Gerakan Kewirausahaan Nasional*). The purpose of GKW is to enhance the

entrepreneurship spirit of the Indonesian people. The GKW is directed primarily to support national economic activity in promoting the improvement of people’s welfare that rests on four strategic pillars. They are

- a) to increase the high rate and quality of economic growth (pro-growth);
- b) to create and to expand employment (pro-job);
- c) to increase people’s welfare through programs of social safety net for the poor (pro-poor);
- d) to improve the quality of environmental management (pro-environment).

Other efforts made by the government to encourage entrepreneurship are through education policies. Various entrepreneurship programs initiated by the government through the Ministry of Education, like the inclusion of entrepreneurship into national curriculum, grants to support training for entrepreneurship at universities. One of the examples is the provision of grants for students through the Student Entrepreneurship Program (PMW –*Program Mahasiswa Wirausaha*) at the Indonesia University of Education. PMW has been started from 2009. The students who won the PMW program will be awarded a grant of 7-10 million dollars as the initial capital for pioneering efforts. Each year, the fund awards to nearly 100 students in average. Based on the preliminary study of 30 students, the majority of PMW winners have not been able to capitalize this grant effectively. This is because many winners were confused how to start their business when they obtain grant. Most of the students do not have a real picture or experience to run business. Most of them managed to win the program because they passed the stages of selection with high communication skills and promising business plan to be presented in front of the jury. In practice, they do not even have any experiences in running a business.

The essence of entrepreneurship is a creative and innovative thinking. Both of these elements cannot be given only in theories in classrooms. Students should be encouraged to understand and to feel or to be trained to think creatively and innovatively. Entrepreneurship requires a different way of teaching. Starting from providing motivation, examples, and the most important is the effort to practice because entrepreneurship cannot only be learned in the form of theoretical concepts on papers. Based on the phenomenon of the problems, it is necessary to reform and to improve the model of entrepreneurial learning from TCL (teacher-centered learning) to SCL (student centered learning). Lecturers do not only give verbal material, but also actively ask the students to involve. Therefore, the students can get the “real experience” on how to run a business. One of the models that is suitable to use in entrepreneurship teaching is experiential learning model. Experiential Learning Theory (ELT), which is

the basis of the model of experiential learning, was developed by David Kolb in the early 1980s. This model emphasizes a holistic model of learning in the learning process. In experiential learning, the experience has a central role in the learning process. The emphasis makes ELT different from other learning theories. The term “experiential learning” is used to distinguish it from cognitive learning theory, which tends to emphasize cognitive aspect rather than affective aspect, and behavioral learning theory that eliminates the role of subjective experience in the learning process (Kolb, 1984). Based on this background, the research is focused on “The Development of Experiential Learning Model in Entrepreneurship Course.”

The research questions of this study are as follows.

1. How is the typology of students taking entrepreneurship course in Management Study Program and Sociology Education Study Program?
2. How is the entrepreneurship intention of students prior to the model of experiential learning in entrepreneurship course in Management Study Program and Sociology Education Study Program?
3. How is the development of model of experiential learning on Entrepreneurship Course in Management Study Program and Sociology Education Study Program?

In general, this study aims to develop a model of experiential learning in the entrepreneurship learning process. In specific, the purposes of this study are to determine the following.

1. The typology of students taking entrepreneurship course in in Management Study Program and Sociology Education Study Program?
2. The entrepreneurship intention of students prior to the model of experiential learning in entrepreneurship course in in Management Study Program and Sociology Education Study Program.
3. The development of experiential learning model on Entrepreneurship Course in Management Study Program and Sociology Education Study Program.

## 2 THEORETICAL BACKGROUND

### 2.1 Experiential Learning Model

Experiential learning is a model of learning through concrete experiences, by way of role playing, simulations, and group discussions. The combination of “hear, see, and experience” enables experiential learning to affect the learning in three ways: changing cognitive structures, modified attitudes, and

expanded skill sets. Experiential learning focuses on individual learning and its environment. Learners can learn by observing and interacting directly with the material they are learning to provide opportunities to engage in an active learning. Experiential Learning Theory (ELT) model emphasizes a holistic model of learning in the learning process. In experiential learning, the experience has a central role in the learning process. The emphasis makes ELT different from other learning theories. The term “experiential learning” is used to distinguish it from cognitive learning theory, which tends to emphasize cognitive aspect rather than affective aspect, and behavioral learning theory that eliminates the role of subjective experience in the learning process (Kolb, 1984).

This theory defines learning as the process whereby knowledge is created through the transformation of experience. Knowledge is the result of a fusion between understanding and transforming experience (Kolb, 1984). Experiential learning can also be defined as the act to achieve something based on experience, which is continuously changing in order to improve the effectiveness of the learning outcomes itself.

Experiential learning emphasizes the strong desire of the student to succeed in learning. Motivation is based on the purposes to be achieved and the learning method chosen. The desire to succeed can enhance the student’s responsibility to conduct their study and they will be able to control their behavior. The model of experiential learning gives students the opportunity to decide the type of experience that will be their focus; the skill that they want to develop; and how to make the concept based on their experiences. This differs from the traditional learning approach where students are passive and teacher control without involving student in learning process. According to Baharuddin and Wahyu (2008: 166), learning through experience (experiential learning) refers to the process of learning that involves students directly in issue or the material being studied. Based on the concept of learning through experience, all activities of life experienced by the individual are learning tools that can create knowledge. Mardana (2005) suggested that learning from experience covers the link between doing and thinking. If the student is actively involved in the learning process, the students will learn much better. This is because in the process of learning enable students to actively think about what is learned and how to apply what they have learned in real situations.

From the above definition, it can be concluded that the model of experiential learning is learning as a process of constructing knowledge through the transformation of experiences. This model refers to the process of learning that involves students directly in issue or the material being studied. Thus, this

model of experiential learning takes advantage from student’s new experiences and of reactions to understand and to transfer of knowledge, skills, and attitudes.

Experiential learning model was introduced in 1984 by David Kolb. It defines learning as the process of how knowledge is created through the changes of experiences. Knowledge is caused by a combination of understanding and transforming experience (Kolb, 1984: 41). The excellences of the Experiential Learning Model are as follow.

1. Improving learner spirit as an active learner.
2. Creating a conducive learning atmosphere where learners rely on individual discoveries.
3. Bringing up excitements in the learning process where learning are dynamic and open from all directions.
4. Encouraging and developing creative thinking where learners are participated to find something.

The learning procedure in experiential learning consists of four stages: real experience stage, reflection observation stage, conceptualization stage, and implementation stage.

In the above stages, the learning process starts from concrete experiences. The experience is then reflected individually. In the process of reflection, someone will try to understand what is happening or what happened. Reflection is the basis for the process of conceptualization or understanding of the principles underlying the experience and forecasts the possibility of its application in the context of the new or the other situation. The implementation process is the situation and the context that allows the application of the concepts already mastered. The possibility of learning through real experiences then is reflected by reviewing what had been done. The experience that has been reflected then rearranged to form new understandings or abstract concepts that will be a guide for the creation of new experience or behaviors. The process of experience and reflection is categorized as a process of discovery (finding out), while the conceptualization and implementation processes are categorized in the implementation process (taking action).

## 2.2 Entrepreneurship

Actually, humans have talent and potential to be far more than what is expected and used. Therefore, an achievement of someone is not dependent on the extent of talent and potential, but also on how much and in what way the talent and potential are used. The nature and attitude will determine the success in the purpose of life.

Attitude is important for humans because its presence enable humans to interact with the surrounding environment without forgetting the

norms prevailing in the community. That attitude can be formed with the development of the individual and is met by some factors, both internal factors (including physiological and psychological factors), and external factors (including experience, situation, norms, and values in society). Suryana (2003: 1) states that the entrepreneurial attitude is not only owned by businessmen but can be owned by any creative and innovative thinking person among both businesses and the general public such as farmers, workers, employees, government, students, teachers, and leaders of other organizations.

Entrepreneurial attitude can also be formed by education and training of entrepreneurship because education and training is a way for humans to learn to be more advanced, independent, and creative. In addition, the presence of entrepreneurship education and training is expected to change both skills, knowledge, and attitudes. Alma (2005: 7) states that students should be given attitudes and behaviors to open a business, and then we will make them talented entrepreneurs. Riyanto (2000: 6) also states that entrepreneurial education and training is a kind of education that teaches people to be able to create their-own business activities. Such education is pursued by building faith, soul, and spirit; building and developing the mental attitude and the nature of self-employment; developing entrepreneurial thinking and spirit, promoting and developing the power of self-propulsion; Understanding and mastering the techniques in facing risks, competition, and a process of cooperation; understanding and mastering the ability to sell ideas; having the ability stewardship or management, as well as specific skills including mastery of specific foreign languages for communication purposes.

Entrepreneurship education, family environment, and activity in student organizations can be valuable to make young entrepreneur of educated persons. This is in line with the opinion of Alma (2005: 6) that transformation of knowledge entrepreneurship has expanded lately. Similarly, in Indonesia, entrepreneurial knowledge can be taught in primary schools, secondary schools, colleges, and various courses of business. Purnomo (2001: 15) argues that the basic self-employment is education, infrastructure, and training, Information, counseling, and guidance, management, and protection, and legal certainty, approach strategies, intrinsic appreciation of life, and Repair.

Entrepreneurship education and training is education that is oriented to the formation of entrepreneurial spirits: courage and willingness to face problems of life and living a natural and creative life, and to find solutions to overcome the problems, independent spirit, and not rely on others (jk\_stn@plasa.com). Through the entrepreneurship education and training, it is expected to result new

attitudes, skills, and knowledge. This is consistent with the objective of entrepreneurship education and training according to Soemanto (1999: 79): "Preparing individuals to responsibly obtain welfare with all aspects of personality development".

In line with the demands of rapid change in the paradigm of growth-equity shift and the change in the direction of globalization that demands excellence, equity, and competition, today there is a paradigm shift of education. According Suharto (1997: 4), the Entrepreneurship Education has been taught as a discipline that is independent, because entrepreneurial contains an intact body of knowledge and real (distinctive), that there are theories, concepts, and complete scientific method.

Entrepreneurial attitude is the basis for improving the success that is the basis for increasing success in various fields or vocational required in the broad life. So someone who has a mental attitude of entrepreneurs will have the ability to hard to reach his goals and needs, both for his own life and the lives of their families.

## 2.3 Previous Study

Based on Andari (2010), entrepreneurship education and training is one of the important parts to transfer knowledge, skills and entrepreneurial attitudes of students, in order to achieve the expected success of the goal of learning the various components necessary to support activities in the education and training such as materials, methods, instructors, facilities, and evaluation of learning. The entrepreneurial attitude of Vocational High Schools in Bandung may be formed through a process of education and entrepreneurship training. The influence of entrepreneurship education and training variables to the variable of entrepreneurial attitude in Vocational High Schools in Bandung is 52.5%.

Hendrayati (2011) in her study reveals many challenges faced by businessperson to maintain the viability of the business and achieve success. To overcome these problems and to realize the success of a business, of course, there should be real efforts on the part of businessperson. In order to truly be a successful entrepreneur, it requires a true entrepreneurship mental reflected in the operations of entrepreneurship characteristics: self-confidence, results-oriented tasks, risk-taking, the nature of leadership, originality, and oriented to the future to achieve business success. Development in the understanding of the characteristics and backgrounds owned by someone who wants to start a business is an important step to encourage an entrepreneurship potential and improve their probability of success. Based on statistical calculations by using path analysis, it turns out to affect the success of the entrepreneurship characteristics of nickel scrap



screen in Bandung either simultaneously or partially. Simultaneously, then the Entrepreneurship Characteristics Influence on Business Success is equal to 75.06%. Individually, then the sub-variables that most influence is the orientation of the task and the results of 23:22% while the smallest sub-variables that influence is on the future orientation of 1:18%.

Based on Andari (2012), the creative industries have been recognized by various parties. It is one of the main drivers of a country's economy. As we know, Indonesia Creative Industry does not only contribute to the Gross Domestic Product (GDP) but also a significant national job providers, increase in the value of exports, the creation of a positive business climate, building the image and identity of the nation, based on renewable resources, innovation and creativity which is a competitive advantage of a nation, and also provide a positive social impact. The role of creativity-based education institution is very significant, especially in response to the global increasing need to the results of the creative industries.

Based on the research by Hendayati (2011) and Andari (2012), the attitude and behavior of student entrepreneurship should be fostered by the entrepreneurship education both in intra education in schools and in practice in the industry. Entrepreneurship is a discipline that is not enough by theories derived from education, but should be applied through training. Entrepreneurial training provides opportunities for students to apply the material they have learned

### 3 METHODOLOGY

The research was conducted in April - November 2014. The study was conducted in the Management Study Program and Sociology Education Study Program of Indonesia University of Education.

A study needs a method to derive a conclusion. This study uses a method of research and development for a product or an outcome. In this regard, it is a learning model. This method consists of several stages, starting with the potential and problems, the design revision, data collection, product design, design validation, testing usage, product revision, and production.

This study analyzes data about the typology of students taking entrepreneurship courses, as well as interest in entrepreneurship prior to the implementation model of experiential learning.

The research subjects can be found in the sample population of this study. Population is a generalization consisting of the object or subject that has certain qualities and characteristics determined by the researcher to be studied and then drawn

conclusions (Sugiyono, 2009). Based on this definition, the population in this research is the entire students taking entrepreneurship courses at Management Study Program for a total of 75 students and Sociology Education Study Program for a total of 90 people.

The data collection technique is a process of procurement for the purposes of research in which the collected data describing the variables studied. The data were obtained through interviews with students taking entrepreneurship courses, observation on the object under study during the learning process, a questionnaire about the typology, students interest of entrepreneurship, and the literature on models of experiential learning and entrepreneurship.

## 4 RESULT

### 4.1 Profile of Management Study Program, Faculty of Economics and Business Education, Indonesia University of Education

Management Study Program is one of the non-educational study programs that was founded in 2002 under the Faculty of Economics and Business Education, Indonesia University of Education. Graduates of this study program will gain a degree in bachelor of economics. Entrepreneurship is taught in the study program as one of the compulsory courses given in semester 5. Currently, the number of students taking this course is as much as 75 students. From the observation, many students in this study program have an experience in running their own business. Some of those even participated in various entrepreneurship competitions in local, regional and national level.

### 4.2 Profile of Sociology Education Study Program, Faculty of Social Sciences Education, Indonesia University of Education

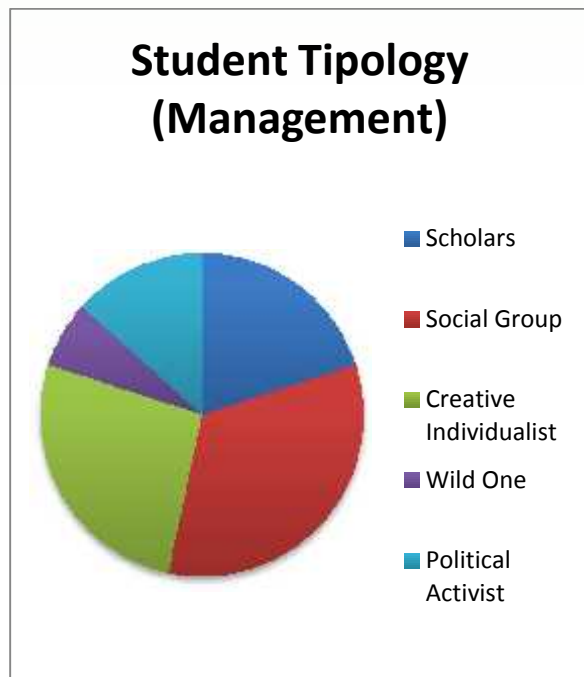
The Sociology Education Study Program is one of educational study programs that was founded in 2011 under the Faculty of Social Sciences Education, Indonesia University of Education. Graduates of this study program earn a bachelor of education. Entrepreneurship is taught in the study program as one of the compulsory courses given in Semester 3. Students that take this course are 90 students. From the observation, only a few students in this study program that has been trying to do the entrepreneurship.

### 4.3 Typology of Students

Based on the research instruments that have been developed previously, the typology of students is divided into the following.

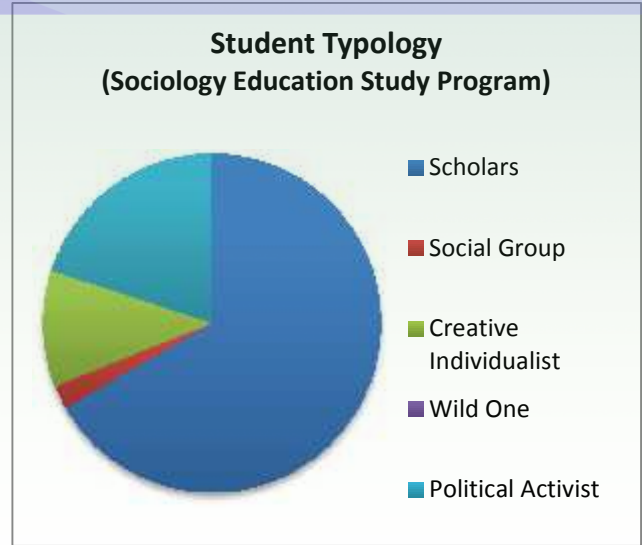
1. Scholars
2. Social Group
3. Creative Individualist
4. Wild One
5. Political Activist

Based on the results of the questionnaires it is known that the majority of students of Management Study Program is considered to be Social Group while the majority of the students of Sociology Education Study Program is considered Scholars. It can be seen in the following chart.



Grafic 1. Student Typology Management Study Program

Based on the graphic above, it can be concluded that majority of students are considered to be social group (25%), while creative individualist reached the second highest with 20%. There is 15% of scholars, 10% of political activist and only 5% considered to be the wild one. This means that majority of students love to socialize with others, like to engage in non academic activities on and off campus as well as making friends with others.



Graphic 2. Student Typology of Sociology Education Study Program

The result is different with student typology for Sociology Education Study Program which most of the students considered to be in a scholars group (60%). They love to study, they really consider on their academic performance and they measure their success by their academic achievement. Only 10% which belongs to creative individualist, 18% political activist, only 2% is in the social group and none of the student considered to be wild one.

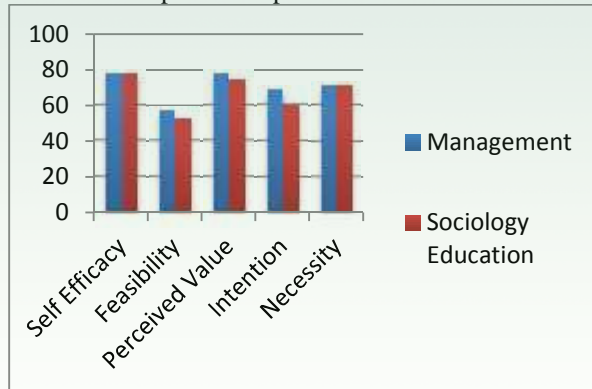
### 4.4 Entrepreneurship Intention

The research instrument was designed to determine the extent of the intention of the students to entrepreneurship. The questionnaire was given at the initial session before the Experiential Learning Model being implemented to the students. The assessed aspects are

- a) Self Efficacy;
- b) Feasibility;
- c) Perceived Value;
- d) Intention; and
- e) Necessity;

We can see the result from the table below.

Table 1. Entrepreneurship Intention of Student



The table shows that the overall index for entrepreneurial intention of student in Management Study Program is higher than the entrepreneurial intention of student in Sociology Education study Program, with the index of 71,18% and 68,26% respectively. This result is before the students go for a field practice. Questionnaires were given away on the second meeting of the course. The dimensions which have the highest index for students of Management Study Program is self efficacy (77,64%) as well as perceived value (77,60%), while the lowest one is feasibility (56,89%). This shows that the students realized the skills that they have and willing to use it for self development. Moreover, they have a good score in negotiation and leadership skills, as well as in creativity and innovativeness. The students are aware of the benefits of having their own business and they realize their role in their business. For intention and necessity dimension, the index is 68,88% and 70,4%.

The result for entrepreneurship intention of student of Sociology Education Study Program is almost similar. The highest index lies in self efficacy (77,56%) with perceived value in the second highest (74,44%). Necessity and intention scored 71,11% and 59,33%, while feasibility has the lowest index which is 52,59%. Based on the data we can conclude that self efficacy has the highest index and feasibility in the lowest in index, both for Management and Sociology Education Study Program. This shows that they realized that they have special skills but they don't see a certainty on how they will run the business and whether their business will success or not.

#### 4.5 The Development of Experiential Learning Model

In order to develop the experiential learning model in entrepreneurship course, several stages of implementation are conducted and the hierarchy in the course syllabus will eventually be spanned. Instead of giving theory in every meeting (16 weeks

of meetings), we conclude theory as well as field practice in the syllabus. Here is the detail:

- Session 1: Syllabus Presentation, House of Rules and Group Formation
  - Providing material to strengthen the understanding of the concept of entrepreneurship.
  - Distribution of the questionnaire that is related to typology and student entrepreneurship intentions. This week each group has begun to discuss what will they run.
- Session 2: Introduction on Entrepreneurship concept
- Session 3: Business Establishment
  - Providing material to strengthen the understanding of the concept of entrepreneurship
- Session 4: Business Plan
  - Providing material to strengthen the understanding of the concept of entrepreneurship
  - Each group is assigned to design a business plan
- Session 5: Business Plan Design
  - Assistancy on Business Plan Design
- Session 6: Business Plan Presentation
- Session 7: Mid-Term Examination  
Evaluation of entrepreneurship concept and business plan they have created
- Session 8-10: Field Practice  
Each group implement their business plan
- Session 11: Progress Report  
Each group makes progress report to be evaluated by a team of lecturers. This includes the course practice, challenges, and obstacles faced and the suitability of the implementation of the plan.
- Session 12-14: Field Practice  
Each group returns to the field to continue the practice of entrepreneurship based on input from the faculty team (based on the progress report given to the faculty team questionnaire on entrepreneurial intention after they undergo entrepreneurial practices
- Session 15-16: Final Presentation  
Each group presents the outcome of the entrepreneurial practices that have been implemented

Based on the observation in the field, students get an “entrepreneurship feeling” after they have experienced entrepreneurship field practise. Starting from designing business plan, until finally they practice what they have planned.

## 5 CONCLUSIONS

Based on the research results, there are several conclusions. They are as follow.

1. Student typology is divided into scholars, social group, creative individualist, wild one and political activist. The result shows that the majority of Management Study Program Students are in social group and creative individualist group, while most of students of Sociology Education Study Program are scholars.
2. The entrepreneurial intention index of the students of Management Study Program is higher than that of students of Sociology Education Study Program. It can be seen from its dimension, which are self-efficacy, feasibility, perceived value, intention, and necessity.
3. The implementation model of experiential learning in entrepreneurship courses is developed by combining theoretical concept of entrepreneurship and field practice to increase student interest in entrepreneurship.

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## The Application of Kaulinan Barudak in Lesson Study approach as a stimulator to Development Students' Emotional Intelligence

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**Abstract:** This study aims to describes lesson study group activities, and students' changing in emotional intelligence in teamwork. This is a type of descriptive qualitative study. In data collection, the researcher acted as the main instruments and supporting instruments, namely observation sheet of Lesson Study and collaboration development aspects. Technique of data collection was done through observation, visual documentation and video. Data was analyzed by qualitative data analysis techniques by using and analyzing the results of observation: whereas the quantitative analysis techniques conducted by using descriptive statistics. Description of the results showed that: the activities of students who performed are influenced by a) students' teamwork, b) students' understanding of Kaulinan Barudak. Students' development of emotional intelligence in team work showed 60% increased. The study recommended for (1) teachers can applied Kaulinan Barudak to increase students' emotional intelligence; (2) the government can improve Kaulinan Barudak in lessons which have relation with preservation of culture.

**Keywords:** Kaulinan Barudak, Lesson Study, emotional intelligence

### 1 INTRODUCTION

In this era of globalization, many emerging game, especially the modern game with some creativity. Along with the progress of course have an impact erosion of the traditional game, even if there is only they who live in the village. We need to preserve the traditional game, considering it was all inclusive cultural traditions and ancestral heritage. In addition it should also be imparted to the present generation of teenagers that we need to preserve these results as a cultural heritage.

In addition to preserving the ancestral culture, traditional game needs to be preserved because it provides many educational benefits for adolescents. Play a very significant to the development of adolescent physical, social, emotional, and cognitive. Playing is a way to explore and develop the motor skills of children, including understanding the values of life. Unfortunately, space is very limited play for teenagers, especially in big cities nowadays.

Modern games certainly have a different characteristic with traditional games. These differences will affect the character of a person, especially teenagers who are experiencing developmental.

Previously, small children fill the time with various games (kaulinan) to pass the time after learning or helping their parents. Sundanese culture, known as Kaulinan Barudak or children's games. with advances in technology, the spirit Kaulinan Barudak began to decrease and have some impact on the game that uses technology.

As a summary, the National Institute on Media and the Family (see [http://www.mediafamily.org/facts/facts\\_effect.shtml](http://www.mediafamily.org/facts/facts_effect.shtml)) suggests the following potential negative effects of inappropriate video games are over-dependence on video games could foster social isolation, as they are often played alone; practicing violent acts may contribute more to aggressive behavior than passive television watching. Studies do find that playing violent video games may be related to aggressive behavior; games can confuse reality and fantasy; academic achievement may be negatively related to over-all time spent playing video games.

### 2 LITERATURE REVIEW

#### 2.1 Kaulinan Barudak

Children games wellknown as Kaulinan Barudak in Sunda culture. In this part, we focus in one of Kaulinan Barudak. The game is Galah Asin. Galah Asin or in another area called Galasin or Gobak Sodor is a game similar regions of Indonesia, which is currently still can be encountered played elementary school children. This game is a group game that consists of two groups, where each team consists of 3-5 people. The core game is facing an opponent that can not pass through the line to the last line back and forth, and to win all members of the group must complete the process back and forth in a predetermined area of the field.

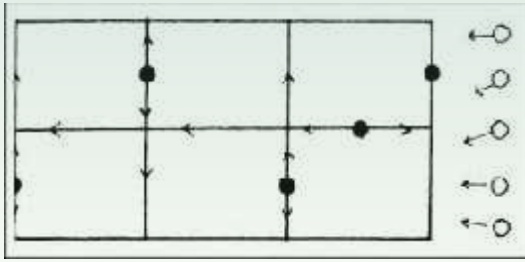


Figure 1. How to Play Galah Asin

The game is very interesting, fun and extremely difficult because each person must always be on guard and ran as fast as possible if necessary to achieve victory. Spiritual values in this game other than unity, we can also learn a compact cooperation between the guard and another guard that the opponent does not spiral out of control to get out of the confines us. On the other hand for the breakthrough that is accomplished, there are still many doors open if the perceived gap has closed. This game teaches how a group works together, also to understand each other.

## 2.2 Lesson Study

Lesson study is a professional development process that Japanese teachers engage in to systematically examine their practice, with the goal of becoming more effective. This examination centers on teachers working collaboratively on a small number of "study lessons". Working on these study lessons involves planning, teaching, observing, and critiquing the lessons. To provide focus and direction to this work, the teachers select an overarching goal and related research question that they want to explore. This research question then serves to guide their work on all the study lessons.

While working on a study lesson, teachers jointly draw up a detailed plan for the lesson, which one of the teachers uses to teach the lesson in a real classroom (as other group members observe the lesson). The group then comes together to discuss their observations of the lesson. Often, the group revises the lesson, and another teacher implements it in a second classroom, while group members again look on. The group will come together again to discuss the observed instruction. Finally, the teachers produce a report of what their study lessons have taught them, particularly with respect to their research question.

There are three steps in lesson study. First, research and preparation. The teachers jointly draw up a detailed plan for the study lesson. Second, implementation. A teacher teaches the study lesson in a real classroom while other group members look on. Third, reflection and improvement. The group comes together to discuss their observations of the lesson.

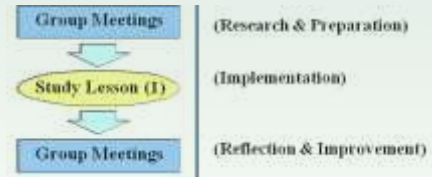


Figure 2. Steps of Lesson Study

## 2.3 Emotional Intelligence

Emotional Intelligence - EQ - is a relatively recent behavioural model, rising to prominence with Daniel Goleman's 1995 Book called 'Emotional Intelligence'. The early Emotional Intelligence theory was originally developed during the 1970s and 80s by the work and writings of psychologists Howard Gardner (Harvard), Peter Salovey (Yale) and John 'Jack' Mayer (New Hampshire). Emotional Intelligence is increasingly relevant to organizational development and developing people, because the EQ principles provide a new way to understand and assess people's behaviours, management styles, attitudes, interpersonal skills, and potential. Emotional Intelligence is an important consideration in human resources planning, job profiling, recruitment interviewing and selection, management development, customer relations and customer service, and more.

Emotional Intelligence links strongly with concepts of love and spirituality: bringing compassion and humanity to work, and also to 'Multiple Intelligence' theory which illustrates and measures the range of capabilities people possess, and the fact that everybody has a value.

The EQ concept argues that IQ, or conventional intelligence, is too narrow; that there are wider areas of Emotional Intelligence that dictate and enable how successful we are. Success requires more than IQ (Intelligence Quotient), which has tended to be the traditional measure of intelligence, ignoring essential behavioural and character elements. It means a high IQ rating, success does not automatically follow.

The five Components of Emotional Intelligence (Goleman, 1995) include first self-awareness, it is the ability to recognize and understand personal moods and emotions and drives, as well as their effect on others. Hallmarks of self-awareness include self-confidence, realistic self-assessment, and a self-deprecating sense of humor. Self-awareness depend on one's ability to monitor one's own emotion state and to correctly identify and name one's emotions.

Second, self-regulation, it is the ability to control or redirect disruptive impulses and moods, and the propensity to suspend judgment and to think before acting. Hallmarks include trustworthiness and

integrity; comfort with ambiguity; and openness to change.

Third, Internal motivation. It is a passion to work for internal reasons that go beyond money and status -which are external rewards, - such as an inner vision of what is important in life, a joy in doing something, curiosity in learning, a flow that comes with being immersed in an activity. A propensity to pursue goals with energy and persistence. Hallmarks include a strong drive to achieve, optimism even in the face of failure, and organizational commitment.

Fourth, empathy. It is an ability to understand the emotional makeup of other people. A skill in treating people according to their emotional reactions. Hallmarks include expertise in building and retaining talent, cross-cultural sensitivity, and service to clients and customers. (In an educational context, empathy is often thought to include, or lead to, sympathy, which implies concern, or care or a wish to soften negative emotions or experiences in others.)

Fifth, social skills. Proficiency in managing relationships and building networks, and an ability to find common ground and build rapport. Hallmarks of social skills include effectiveness in leading change, persuasiveness, and expertise building and leading teams.

In this part, we focus in social skill of emotional intelligence. The more spesific is leading teams or team work.

### 3 RESEARCH DESIGN

The respondents involve twenty students from ninth grade. The current study is based on data generated by a questionnaire. The questionnaire consisted of questions to explore the extent to which students' understanding of the *galah asin* and the increase students' ability to work in team. questionnaire processed with simple data processing to determine the effectiveness of the results of giant game salty through pre-test and post-test.

Lesson study used in this study to examine the practice, with the goal of becoming more effective. Lesson study involved five teachers. After the team was formed, made planning and selected a model teacher. after it was implemented in the classroom and outside the classroom to practice the game pole salty. after implementation is complete, conducted by a team reflection.

### 4 FINDING AND DISCUSSIONS

The relation between the respondents needed in the game Galah Asin. Proximity be a major factor for respondents to be able to bring out and enhance cooperation skills in the game. The relationship between the respondents tend not to be emotionally

close before Galah Asin done (25%). After the game done, respondents feel close to one another even though the level increase until (60%). This is consistent with that presented by Simon Priest in Misbach (1986) which states the outdoor education is a method of "learning by doing", which is a learning situation that participants will gain a better experience to develop skills of self and social skills, which can be concluded that the game can increase emotional closeness between players.

Team work skills are a must exist at the time will do the *galah asin* game. Before performing these skills, respondents need to understand the meaning of teamwork skills. Understanding of the notion of cooperation alone is not enough. Therefore, the ability to work together in groups is also required in addition to an understanding of the meaning of cooperation. This capability is needed so that when the game is done, the group can work together well. In addition to the ability to be able to work together, the respondents should know that it is actually in the game contains the value of cooperation. Researchers want to know how many respondents who find the value of cooperation before and after play.

It can be stated that the game requires skill in Galah Asin need good team work among the players. In addition, issues related to cooperation skills is understanding what it means to work together for each respondent. Can be seen, that the respondents did not know the meaning previously team work but after they play Galah Asin, they know what the meaning of such team work. Respondents were able to and can feel the skills of cooperation arising from the *galah asin* game. This statement can be seen from the chart above that the respondents are able and can find the value of working together as a whole (60%). This can be evidenced by Misbach (2006) in a research report that the role of traditional games in the social aspects that establish relationships, cooperation, social maturity train with peers and lay the foundation for practicing role socialization skills training with older adults, people. A similar sentiment was expressed by Iswinarti (2005) that the traditional game provide benefits for child development.

Reflection lesson study results showed that the students enthusiastic in participating in the activities. The students are actively involved in the activities. Shortage of lesson study this activity is the limit line easily lost because of trampled by students so that replaced using duct tape.

## 5 CONCLUSIONS

Team work is a skill that should be owned and understood by each adolescent. Because these skills are skills that will be taken continuously by each individual to the old days. Interpersonal skills can be enhanced cooperation through *galah asin* game. However, knowledge of adolescents against traditional games is minimal, therefore, the need for preservation in every school to boost their reintroduction heritage of our ancestors, especially the traditional game, which contains the values of life, especially team work. Lesson study is very helpful to the extent to which the effectiveness of the methods used and also increase cooperation with fellow teachers.

## 6 ACKNOWLEDGEMENTS

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## The Art of Connotation for Visual Texts through Lesson Study: A collaboration between two schools in Singapore

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**Abstract:** This article documents a parallel Lesson Study (LS) conducted in two different secondary schools in Singapore as part of a project under the Ministry of Education, English Language Immersion Programme (EIP) 2013-2014. Working collaboratively, a common area of concern in the teaching of the English Language was identified, namely visual literacy pedagogy - a key highlight of the Singapore English Language Syllabus 2010. To scaffold the process of thinking and analysing information in a systematic and logical manner, the Ethos, Pathos, Logos (EPL) framework was used to help students apply critical reading and viewing skills by focusing on implied meaning, higher order thinking, judgment and evaluation to the visual texts, which are essential 21st century skills. Though the theoretical underpinnings and framework for both LS were identical in both schools, each differentiated the lesson to cater to their respective learner profiles; one to 14-year old students consisting mostly of audio-visual learners and the other to 16-year old students who were more inclined towards cognitive processing of information. Research lessons were crafted using exemplars, video clips, and other resources. The outcomes clearly suggest students were more engaged and aware of the need to read and process visual stimuli critically in the real world. They recognised the interconnectedness of textual and typographical elements of a range of visual texts through the art of connotation. The process of crafting the focus, involving teachers in the process, implementing the research lesson(s), and learning from the post-research lesson discussion will be examined in the article.

**Keywords:** Lesson Study, Visual texts, Visual literacy, Ethos, Logos, Pathos

### I BACKGROUND

#### 1.1 Executive Summary

Two secondary school English Language teachers in Singapore were selected to participate in a week-long local English Immersion Programme (EIP, 2013-2014) organised by the English Language and Literature Unit of the Curriculum Planning and Development Division (CPDD). The programme seeks to provide participants with the opportunity to observe, learn and reflect on the pedagogy and programmes offered in several local and international schools in Singapore. After the attachment, the two teachers from School A and School B collaborated on a project to help their students ‘apply critical reading and viewing [skills] by focusing on implied meaning, higher-order thinking, judgement and evaluation’ (Curriculum Planning and Development Division, Ministry of Education, Singapore). More specifically, visual texts were chosen as the focus as ‘academic literacies in the twenty first century entails being able to navigate multiplicity, to critique representations in multiple modes, media and genres, and use of technologies in composing multimedia texts’ (Archer, 2012). Both teachers who have been

teaching for over a decade in the local schools in Singapore, saw the need to adjust and adapt their pedagogy to allow greater alignment ‘to the explicit teaching of the associated language features which in turn demands students’ acquisition of the metalanguage involved’ (O’Neill, 2012).

To equip students with the necessary metalanguage to analyse a visual text, the Aristotelian rhetorical appeals of Ethos-Pathos-Logos (EPL) framework was used. Based on Aristotle’s *On Rhetoric*, Ethos is ‘achieved by the speaker’s personal character when the speech is so spoken as to make us think him credible’ (Aristotle); Pathos when the speech stirs their emotions (Aristotle); and Logos ‘when we have proved a truth or an apparent truth by means of the persuasive arguments suitable to the case in question’ (Aristotle). More than a tool to analyze and evaluate visual texts, it also ‘provides our students with the critical vocabulary to transfer skills from the literary domain of literary analysis to the domain of composition’ (Kemp, 2001), allowing them to also create more effective visual texts of their own.

Though both schools shared the same EPL Framework, they differed in their adoption of the

pedagogical approach based on their students’ needs. School A’s class consisted mainly of 16 year old students who were being prepared for the high-stakes GCE O Level Examinations at the end of the year. The Professional Learning Community (PLC) team thus worked to craft a lesson explicitly focusing on helping the students to improve their understanding of the visual text assessment in the English Comprehension paper. School B’s class consisted of 14 year old students who were more inclined to respond positively to a hands-on delivery of concepts. The PLC team thus crafted their lesson using a video clip that required students to apply the rhetorical appeals.

## II THE LESSON

### 2.1 How to Teach the Lesson

#### 2.1.1 Research Lesson in School A

Prior to the lesson, the class of twenty six, 16-year old students were divided into seven groups, each consisting of an average of four members belonging to the same Co-Curricular Activity (CCA) group. Each CCA was tasked to bring a recruitment poster that they had used for the year’s CCA Recruitment Campaign. All posters were collected beforehand and kept by the teacher in preparation for the lesson.

The class began with a statement of the learning goals for the lesson. A Big Question was also asked to set students thinking: ‘Given that the purpose of a visual text is to communicate its message clearly and persuasively to its reader, what makes it successful?’ With that in mind, the EPL framework was introduced: Ethos the credibility of the message, Pathos the emotional appeal of the message and Logos dealing with the logical appeal of the message. Students were given examples of each rhetorical appeal, followed by a short quiz to check their understanding of the concepts.

Using a graphic organiser, the teacher then modelled using the EPL framework to deconstruct and critique of a visual text based on the appeal to its intended Purpose, Audience, Context and Culture. Students then used the EPL framework and the same graphic organiser to do the same for another visual text in their respective groups before finally attempting a third visual text individually to assess their personal learning. This first half of the lesson lasted 35 minutes in total.

Using their newly acquired skills, the students collaborated in their respective groups to analyze and evaluate the efficacy of their respective CCA posters using the EPL framework and the same graphic organizer. They then proposed three amendments to their original CCA poster before they started to create a new and improved version, which would be completed by and reviewed during the next lesson. This second half of the lesson lasted 30 minutes.

Students spent the final five minutes before the end of the lesson writing a reflection on the extent to which they have achieved the learning objectives. Their reflections were collected by the teacher and used to help analyze the impact of the lesson. Students were also tasked to complete the redesign of their CCA posters as homework and bring both versions for the next lesson for evaluation.

#### 2.1.2 Research Lesson in School B

Prior to the lesson, the class of forty, 14-year old students were randomly divided into seven groups, each consisting of an average of 6 to 7 members. The PLC team prepared seven visual texts, each differing in type, as well as a video entitled ‘SK-II: The Discovery - Japanese Bamboo Flute’ (Hooper) which captures the essence of EPL.

The lesson began with a pre-activity, wherein each group analyzed a different visual text to identify its purpose, which were collated and written on the whiteboard by the teacher. The learning goals were then introduced to students. Emphasis was also given on the purpose of the visual text – to allow the writer/reader to communicate messages in a persuasive manner, and that visual texts can be in both print and non-print form. This first part of the lesson lasted 10 minutes.

The word ‘SK-II’ was then written on the whiteboard to check on and bridge students’ schema through a word splash prior to showing them the video and eliciting information of the non-print visual.

The video was first viewed from the start to the end continuously. During the second viewing, it was paused at two separate points. At 0:26 seconds, students expressed their reactions to the girl wanting to explore the place where people do not grow old (to demonstrate how pathos is evoked). At 1:35 seconds, students identified the effects of rice wine. To demonstrate how Logos is evoked, the teacher also conducted a survey on how many students would consider buying the product at a later stage of their lives.

After the video was discussed, the EPL framework was then introduced and explained to students. To help students remember the framework, images were used to represent each rhetorical appeal: Ethos by the image of a doctor, Pathos the image of a heart, and Logos by the image of a brain. Following that, students were asked which rhetorical appeals were utilized in the SK-II video. This second part of the lesson lasted 20 minutes.

Subsequently, students’ understanding of the rhetorical appeals was assessed via a quiz, where each group identified the answers to three statements relating to EPL. They had to place the appropriate

image on their paper before holding up their answers for the rest of the class to see and comment.

After confirming the quiz answers, to check on students' understanding and retention of the concepts, students were then shown a poster which they had to analyse using the EPL framework based on the stylistic, textual and typographical elements. The teacher also modelled the process by analyzing the image in the poster, explaining that not every part of EPL is applicable to the textual and typographical features of a visual text. This final part of the lesson lasted 25 minutes.

Students spent the final five minutes before the end of the lesson completing a feedback form on their learning experience for the lesson. The feedback forms were collected by the teacher and used to help analyze the impact of the lesson. Students were then assigned a worksheet as homework to further consolidate and apply the concepts taught.

## 2.2 Student Learning Goals

Both School A and School B shared common learning goals; first, to identify features of the visual text; second to use the EPL framework to infer the ideas communicated by the author; and third to apply the EPL framework when annotating and deconstructing other visual texts. These served to help raise students' awareness of techniques utilised by the creators of visual texts. With careful examination of the elements of visual texts, it is hoped that students will be able to process questions that test their understanding of language used for impact. In the quest to achieve the desired objectives, students were expected to first understand visual texts, second to analyse the text in depth based on how they are put together and third to attain a set of critical skills that allows them to analyse both written and visual texts.

In addition, both schools seek to make the understanding of the EPL framework relevant to their students' lives. School A aimed to have students apply their understanding to improve their existing CCA recruitment posters to increase the enrolment rate of the following year's Secondary 1 students. School B sought to have students apply their understanding to critique advertisements in non-print media.

## 2.3 How the Lesson is Intended to Work .

School A's research lesson is designed to appeal to students' intrinsic motivation to do their best for their CCA. Through this, the learning of the EPL framework is made relevant to their daily schooling life, and thus becomes authentic. The lesson employed the lecture format for information transmission, followed by structured group work for collaborative learning. As students designed and

created a new and improved version of their CCA posters, they were also activating the highest-order thinking skill to Create through planning and producing in Bloom's Revised Taxonomy (Krathwohl, 2002).

School B's research lesson leveraged on the use of New Media to engage and stimulate students to not only think about the textual and typographical features of visual texts, but also infer and present their understanding of the concept of persuasion using EPL with greater depth, organization and structure of print and non-print visual texts.

## III THE STUDY

### 3.1 Approach

The two teachers focused on aligning a suitable and coherent framework (EPL) that could assist their students to gain greater familiarity with the metalanguage to unpack visual texts: Purpose, Audience, Context, and Culture (PACC) (Curriculum Planning and Development Division, Ministry of Education, Singapore). Observations made by the two teachers and feedback for from their fellow PLC mates clearly showed students were not clear and confident in analysing visual texts on their own.

Hence, each EIP teacher then worked with his/her school's PLC members to customize and refine their respective research lesson plans. While the process differed from the standard lesson study by virtue of the fact that the goal and pedagogical method were predetermined, each PLC team continued the process of crafting, brainstorming and tailoring the concept to the research lesson plan. After identifying the target class as well as the teacher conducting the lesson, the respective PLC teams brainstormed the best strategy to facilitate students' learning and maximize engagement based on the class learning profile. From there, the research lesson plans were formulated.

As there were some teachers in the PLC team who were unfamiliar with Lesson Study, they were introduced to the basics of Lesson Study using various resources such as a video interview (CBSNews, 2010) of Catherine Lewis on what Lesson Study is, as well as a series of videos on a Japanese Lesson Study, 'Can You Lift 100 kilograms?' (Komae School #7, 1998).

In addition, research lessons in both schools were not only observed by their own PLC members, but by teachers from the partnering school as well as CPPD Curriculum Officers. Each observer was randomly assigned to observe a specific group. Care was taken to ensure that all groups were observed by 1 to 2 observers. A running record template was given to all observers to use, in addition to a copy of the lesson plan and the seating plan. Before the

lessons commenced, observers were briefed on their roles and intent of the respective research lessons.

The post-lesson colloquium was held immediately after the research lesson. The teacher of the research lesson began by sharing his or her reflections on the lessons, after which each portion of the lesson was discussed by all observers.

### 3.2 Findings / Discussion

#### 3.2.1 School A

Firstly, students’ body language indicated that they were engaged throughout the lecture segment of the lesson. Distracted students were only distracted for a few minutes at most before re-orientating their attention to the teacher, while others were observed to be actively taking down notes of their own accord throughout the lecture. Observers attributed this to not only the variety and relevance of the visual texts used, but also to the fact that the lecture was regularly interspersed with opportunities for students to do both group work and self-assessment. This allowed students to evaluate their understanding and participate in the lesson instead of being passive recipients of information.

Secondly, observers agreed that during the activity segment, students in each group were actively collaborating to analyze and evaluate the efficacy of their recruitment posters, often questioning the efficacy of the words or graphics in their existing poster. This was followed by suggested changes to increase the impact of the visual text element in question, indicating the higher order thinking skills of analysing, evaluating and synthesising. Observers attributed this to the fact that group members all had a huge stake in the outcome of the activity, having a common desire to improve their recruitment posters to recruit as many new members as possible to their CCA. Hence, learning was authentic and applicable to their lives.

Thirdly, throughout the lesson, observers were pleasantly surprised to hear students use the specific metalanguage (Ethos, Pathos and Logos) correctly and with ease. This was unexpected as it was the first time that the students were exposed to these terms. Observers concluded that there were several reasons for this. Having Ethos being represented by a picture of a human figure, Pathos a heart, and Logos a brain in both the lecture slides and the graphic organizer helped students associate each rhetorical appeal to a specific picture. This was further reinforced by the following explanations of each rhetoric appeal in the graphic organizer:

- Logos (Logic): What LOGIC does it use?
- Ethos (Credibility): How can I TRUST what it is saying?

- Pathos (Emotions): What makes me FEEL for it?

Together with the quiz to test their understanding, students thus became familiar and comfortable with using the metalanguage. This indicates that complex terms can be made accessible to students using appropriate pedagogical strategies.

In terms of areas for improvement, observers noted that though the sample visual texts shown during the lecture were varied and interesting, which cognitively and affectively engaged students, the visual texts were primarily visual in nature. Hence, the observers recommended that the learning materials engage multiple senses in order to increase engagement of non-visual learners through the use of mediums such as videos.

In addition, observers provided several suggestions to help groups with their assignments. While the graphic organizer made groups analyse and evaluate their existing visual text according to its title, text and graphics, rubrics for each of these three components could have been crafted and given to students to help them analyse and evaluate the efficacy of their revised recruitment poster. This would also serve to help groups evaluate each others’ recruitment posters come the next lesson.

Lastly feedback obtained from students’ reflection on the extent to which they have achieved the learning objectives indicated that 25 of the 26 students indicated that the lesson has helped them to better understand and analyse the visual text more effectively. However, five students, including the remaining student who did not understand the use of EPL, indicated that they did not know how to use what they have understood from using the EPL to answer comprehension questions, since the questions do not explicitly question students about EPL. This indicates that the next lesson study cycle should explain the relevance of the EPL Framework as an aid to better understand the visual text, rather than being direct answers to comprehension examination questions.

#### 3.2.2 School B

Firstly, observers noted that the group dynamics played an important role in sustaining students’ attention to instructions and tasks. The element of surprise was maintained throughout the lesson as the teacher employed the means of calling on different groups to respond. The groupings were not random but were based on a good mix of gender and ability so as to allow as much equal participation as possible.

Secondly, in terms of student motivation, using an audio-visual (video) encouraged active student discussion as it appealed to their senses and retention. The observers noted that students were on task and clearly enjoyed working on and completing the given task with their teammates.

Thirdly, the behavioural data collected indicate that students displayed a greater sense of pride in fulfilling group tasks. They were also noted to be attentive as well as interested in the lesson. Many took the initiative to contribute willingly to the group tasks. They also took turns to present instead of relying on one presenter throughout the activities.

In terms of areas for improvement, observers reflected that a mix of more open-ended questions and guided questions would have helped students gain a better appreciation of visual texts. One example cited was that the question ‘Why are visual texts important in our lives?’ should have been used instead of ‘Where would you find visual texts in our daily lives?’ as the former would require students to analyze the textual and typographical features to justify their responses.

In addition, observers noted that whilst students were highly engaged in the different group activities, this came at the expense of time to end the lesson at a comfortable pace. It was recommended to narrow the class discussion to one learning activity and to allow students to critique the responses of another group’s answers to check their understanding and to extend their thinking on why they agree or disagree with another group’s answer.

Lastly, feedback collated from students indicated that of the 40 students present, 37 agreed that the lesson has taught them how to better understand a visual text using persuasive techniques like Ethos, Pathos and Logos, with three disagreeing. One recommendation was that students should be explicitly shown the interrelation between EPL and PACC when analyzing visual texts. This would leverage and build on students’ existing knowledge of textual analysis (PACC), allowing them to better utilize EPL to understand a visual text.

### 3.3 Conclusion

This lesson study was the result of the efforts of the teaching fraternity in Singapore to innovate and improve both curriculum and pedagogy. Without the initiative of the English Language CPDD to spearhead the English Immersion Programme (EIP), it would be highly unlikely for secondary school English Language teachers to be given the opportunity to learn and adapt good practices from a school for a full week and to receive tutelage under the Curriculum Officers who also acted as their critical friends. Through their guidance, the teachers were able to gain a deeper understanding of Lesson Study.

Most importantly, the Lesson Study benefitted the teachers involved in both schools’ PLC teams. Through the two EIP participants who served as the team facilitators for their PLC teams, other English Language teachers were introduced to the workings of Lesson Study. The opportunity to observe another teacher in action, as well as share their observations in a non-threatening environment during the post-colloquium allowed every member to reflect on how they each played an important part in owning and improving the lesson they had all collaborated on. Thus, learning is cascaded to teacher colleagues as well. The additional input through the representation from the other school as well as the CPDD curriculum officer allowed for a valuable external perspective to the lesson. Moreover, the Lesson Study cycle ensures that come next year, when the lesson is repeated for the next batch of students, they will receive an even more polished lesson.

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## Proposal of New Engineering Education Aiming at Innovative Products in the Globalization Era

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**Abstract:** This paper proposes a new type of engineering education for universities be introduced from the standpoints of innovative new products. Generally speaking, the development process for new products consists of four stages, namely, target setting, scenario establishment, structuring and validation. To meet several targets such as cost, weight and performance at higher levels, the process is divided largely into two phases. The former half of the process, target setting and scenario establishment plays a critical role in not only making the layout of the new products best but also allocating the functions of the parts of new products for meeting the targets. Without this phase new products would not be successfully developed as number one. Therefore, the former half of the process is the key to the innovation of the new products in the globalization era. Based on the experience of the author, he exemplifies development of vehicles which can meet both high safety performances and light weight. Afterwards, in engineering education this paper describes how the phase should be taught and learned. The phase is associated with innovative and creative researches. Our final goal is to light the fire of students's learning. The first, and most important, ability students should develop in the globalization era is the ability to "learn how to learn"- constantly absorb, and teach themselves, new ways of doing old things or new ways of doing new things. Authors strongly wish that students can acquire this ability and become self-educators and self-motivators to survive in the era.

**Keywords:** Engineering Education, Innovative Products, Development Process, Target Setting, Scenari Establishment.

### 1 INTRODUCTION

The author has been working for a certain automobile company for about 30 years. Based on his experience, it will be proposed that new engineering education aiming at innovative products in the globalization era be introduced in the education of universities as well as national colleges of technology. This paper proposes and focuses on the process of innovative new products and the process is to be taught in the lectures and graduation researches for university students.

There are so many types of researches and developments in automobile industry. However, this paper describes the examples on the development of safety performance of the vehicle since he has been engaged in this region until last year. Although examples cited here are associated with safety performance, the authors strongly believe that the way of thinking and the concept on developing the innovative products can cover other performances of vehicles.

The development circumstance especially for safety is becoming severer and severer all over the world in recent years. Safety performances of vehicles newly introduced into the market are

evaluated, for example, in the form of NCAP (New Car Assessment Program).

### 2 CURRENT STATUS AND ISSUES OF THE DEVELOPMENT OF AUTOMOBILES

Recently every automotive maker all over the world is focusing on high fuel consumption efficiency with combustion engine, Hybrid or Electric Vehicle in an attempt to be environmentally friendly to the earth. New technologies are making great progress. In order to develop such automobiles, it is essential that the vehicle weight itself should be reduced in addition to the development of highly efficient engines. Regarding weight reduction, material substitution is one of the ways to reduce the weight by adopting aluminium and other light materials such as plastics instead of iron. Some engineers are struggling to incorporate countermeasures into vehicles by balancing weight effects with costs. Others attempt to get an ideal crash pulse analytically based on mathematical models. However, few papers have discussed the vehicle framework from standpoints of safety performances and weight at the scenario stage.

## 2.1 Development Process

Basic development process consists of 4 stages, namely target setting, scenario establishment, structuring and validation. To make the development creative and innovative, the two processes of target setting and scenario establishment are extremely important.

## 2.2 Target Setting

First, target setting is explained. In the conventional development, the performance targets of newly developed vehicles have so far been set by researching the competitors so that the new vehicles can overcome those of the current competitors. However, it is extremely difficult to keep the higher performances than competitors in the sharply changing world.

Therefore, the targets of performances should not be BIC (Best in Class) but theoretical limits. The theoretical limits mean the highest targets introduced by theoretical approaches. Although the theoretical limits are the highest targets, the targets are essential to produce innovative products.

## 2.3 Scenario Establishment

A good scenario has a well-balanced way of thinking with respect to safety performances and weight reduction. Optimizations should be conducted at this stage. Although recent in-depth CAE (Computer Aided Engineering) technologies enable us to determine the structure with components targets, numbers of elements consisting of a vehicle are too large to optimize the vehicle as a whole. Therefore a simpler model should be developed for the optimal allocation of functions to each individual component on the framework of the vehicle.

The present paper involves the determination of the framework of the vehicle using the newly developed three dimensional spring-mass models at the scenario stage for the purpose of the optimization from the standpoints of safety performances and weight reduction.

## 3. INNOVATION OF PRODUCTS

### 3.1 Frontal Crash Test Modes

To assess the safety of occupants of a vehicle in a collision, cars are crashed into a barrier and onto each other to obtain the information and deceleration of the vehicle. The barrier tests employed in NCAP (New Car Assessment Program), namely the full width barrier and the offset deformable barrier, will be explained as follows.

### 3.1.1 Full Width Barrier (Full Lap)

This test is a 56km/h full width crash test into a rigid barrier. This rigid barrier represents either a rigid wall or a heavy truck. This frontal crash test is schematically represented Figure 1 (left). The full lap mode tends to give rise to high injury of occupants due to large deceleration of a vehicle. Therefore, the crushable body is preferable to make deceleration of the vehicle smaller.

### 3.1.2 Offset Deformable Barrier (ODB)

This test uses a deformable barrier. An offset deformable barrier (ODB) test involves impact with only the driver's part of the vehicle. The test speed is 64km/h for this 40% offset test. In an offset test there is a significant degree of deformation which makes it suited to evaluate injury to passengers from such deformations. The deformation aluminium barrier represents in its way the opponent's front-end in a frontal car-to-car collision. Figure 1 (right) represents schematically this test. The test mode makes the cabin compartment largely deformed. This leads to strengthening the cabin.

From the standpoints of lessening the occupant injury, therefore, it follows that the full lap mode needs the crushable body whereas the offset mode has the cabin strengthened. Basically, these two modes have the opposite countermeasures.

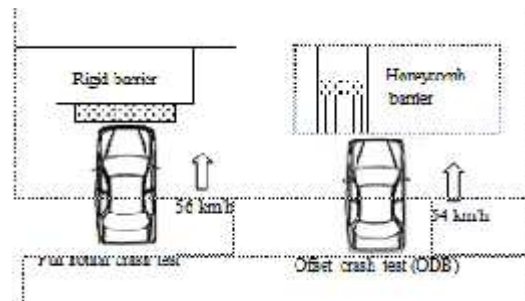


Figure 1 Full width barrier (left) and offset deformable barrier (right)

### 3.2 Spring Mass Model

The framework of the vehicle affects greatly safety performances as well as weight reduction. It is no exaggeration to say that safety performances and vehicle weight depend largely on the vehicle framework itself. Therefore when a new vehicle is designed, the skeleton of the vehicle should be optimized. In order to obtain the optimal solution, thousands of cases have to be conducted for the parametric study. However, in-depth CAE of full car models using FEM (Finite Element Method) is too complicated to adapt the optimization method to the full car model due to time-consuming calculations.

Simpler models are, therefore, essential to optimize the skeleton of the vehicle.

Figure 2 shows the schematic outline of spring-mass model. The three dimensional spring-mass model describes the main components of the vehicle using elements of springs and masses. The spring-mass model was produced, based on the skeleton of the current actual vehicle. The model for (a) full lapand (b) offset is shown in Figure 3. The model is composed of 60 mass and 75 springs. The 3D model sophisticatedly constructed by incorporating uncrushable components such as an engine and a transmission system enables us to reproduce the cabin deformation and the rotation of the vehicle.

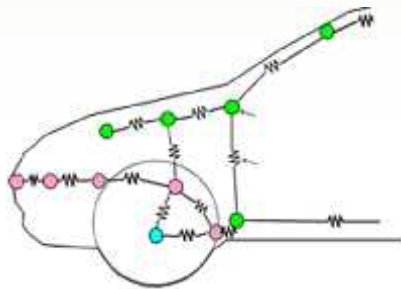


Figure 2 A schematic view of spring-mass model

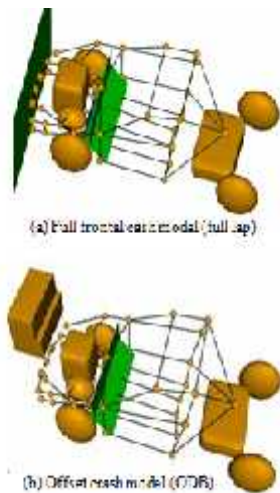


Figure 3 Spring-mass models for full lap and offset

### 3.2.1 Determination of Vehicle Framework

Two steps are taken to determine the framework of the vehicle. The first step is to establish the compatibility between the full lap and the offset mode for safety performances. The second step is the optimization of safety performances and weight reduction.

### 3.2.2 Compatibility between Full Lap and Offset

Figure 4 shows the bubble chart on the relationship between pulse index (PI) and dash intrusion for full lap mode at 56km/h, while the diameter of circle shows the dash intrusion for ODB mode at 64km/h. The vertical axis shows PI value for the injury indices and the horizontal axis designates dash intrusion. Both indices mean that the smaller or the lower is the better. For the offset mode, the larger size of the bubble indicates the larger dash intrusion. The smaller the bubble becomes, the smaller the dash intrusion becomes. Two solid lines in Figure 4 show target lines to be met. The zone where PI and dash intrusion are satisfied for the full lap mode and the offset mode, which is called OK area, should be enlarged from the robust perspective. However, it is found that the conventional model before improvement has the smaller OK area. This is due to the fact that safety performances rely upon front rails, which is hard to achieve a proper balance between front rails and the cabin compartment in strength.

In order to enlarge the OK area, therefore, a new concept is introduced. The new concept is shown in Figure 5, compared with the conventional one. The conventional structure has a single load path which depends largely on front rails. On the other hand, the new concept has multi-load paths. The loads generated during the crash are transmitted to the cabin through three paths, namely, the upper, the middle, and the lower. The new concept will be designed by putting the conventional one together with apron reinforcements for the upper, and sub-frame for the lower. The load path concept has been shifted from the concentrated single load path to the dispersed multi-load paths. Using the spring-mass model with the new concept, the optimization was conducted. The result is shown in Figure 6. Compared with the conventional framework, the new one gives the larger OK area. PI indices become lower at the full lap mode, and dash intrusions at the offset mode designated by smaller circles are improved as well. Owing to the new load path concept, loads induced during frontal crash are dispersed to more components of the vehicle. Therefore it follows that the multi-load path concept gives the higher compatibility to lessen an occupant injury for the full lap as well as to reduce dash intrusion for the offset.

So far using the multi-load path concept, safety performances on the full lap mode and the offset mode have become compatible. To establish the multi-load path concept, the two components; apron reinforcement and sub-frame are incorporated into the vehicle. This leads to the increase of the vehicle weight. The next step is, therefore, taken to optimize the safety performances and weight reduction.



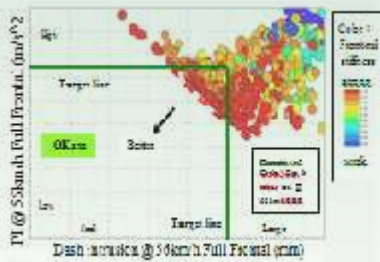


Figure 4 Bubble chart on relationship between injury indices PI (m/s<sup>2</sup>) and dash intrusions (mm) at 56km/h full lap and 64km/h ODB for the conventional concept

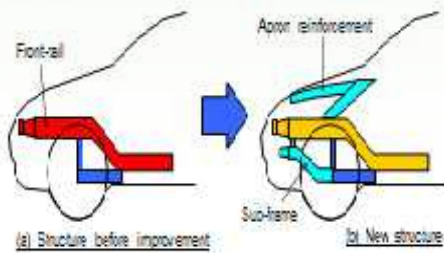


Figure 5 Difference of framework between the conventional concept and the new concept

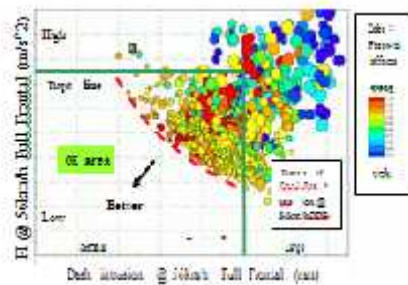


Figure 6 Bubble chart on relationship between injury indices PI (m/s<sup>2</sup>) and dash intrusions (mm) at 56km/h full lap and 64km/h ODB for the new concept

### 3.2.3 Optimization of Safety Performances and Weight Reduction

The next step is to find out the optimal solution with respect to safety performances and weight. The strength of each component is expressed as the function of tensile strength and material thickness related to weight. Safety performances can, therefore, be associated to weight.

The relationships between safety performances and weight are obtained by means of the multi-objective optimization method. Using this method, parametric studies were conducted for thousands of cases as shown in Figure 7. The horizontal axis shows the weight of the front body components associated with frontal crash. Regarding safety performances, the vertical axis indicates dash

intrusion for the offset mode (ODB) at 64km/h while diameters of the circles indicate pulse index (PI) for the full lap mode at 56km/h, which means that large circles have large PI values. As a result, the bubble chart clarifies the Pareto line to satisfy both safety performances and the front body weight. Based on the bubble chart, it is possible to determine the optimal solution to meet the targets regarding dash intrusion, PI value, and weight.

The final goal at the scenario stage is to optimize target characteristics from the standpoints of safety performances and weight reduction. According to the procedure mentioned above, the optimized target characteristics of each component of the vehicle have been determined in the form of material strength and crushable amount (displacement), as shown in Figure 8. Based on the target characteristics, the detailed structures can be determined efficiently.

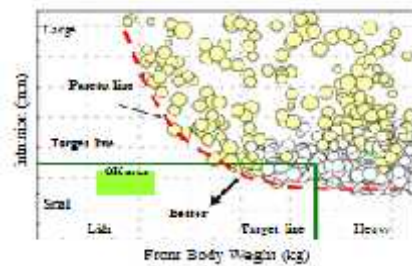


Figure 7 Optimization between safety performances and front body weight



Figure 8 Target characteristics (strength-displacement) of individual components of the vehicle

## 4. SMART ENGINEERS IN GLOBALIZATION ERA

As mentioned above, the development process for new products consists of four stages, namely, target setting, scenario establishment, structuring and validation. To meet several targets such as cost, weight and performance at higher levels, the process is divided largely into two phases. The former half of the process, target setting and scenario establishment, is the phase to Think. The latter half of the process, structuring and validation, is to Act. So far it was found that the “Thinking phase” is the stage which plays a critical role in not only making the layout of the new products best but also allocating the

functions of the parts of new products for meeting the targets. Without this phase new products would not be successfully developed as number one. On the other hand, the “Acting phase” is to determine the structure of the vehicle framework, based on the “Thinking phase”. Therefore, the “Thinking phase” is the key to the innovation of the new products in the globalization era.

Creating innovative products is essential to survive in the era of globalization since competitions become harder and harder in the global scale. What kind of students can survive in the flat world where we can get new information immediately wherever you may be? Goal image of smart engineers who can survive in the globalization era is the students who can learn the way of producing new products. The first, and most important, ability students should develop is the ability to “learn how to learn”- constantly absorb, and teach themselves, new ways of doing old things or new ways of doing new things. Students with curiosity and passion can become self-educators and self-motivators.

Therefore, the former half of the processes, “Thinking phase”, is the key to the innovation of the new products in the globalization era. The phase is associated with innovative and creative researches. In the phase, first clarifying the phenomena by experimental and numerical methods, then the

mathematically solved. The final goal is to find out the governed equations for the phenomena. This leads to determining the theoretical limits as target setting in the first stage of the process. Based on the Figure 8 Target characteristics (strength-displacement) of individual components of the vehicle solutions, the scenario to achieve the target will be established. Students are interested in clarifying the unknown or mechanism of the phenomena they are facing. Such students have the potential for being curious and passionate. From now on we are going to give the students the lessons to learn how to learn as incubation lessons. What are mentioned above will be done.

## 5 CONCLUSIONS

The present paper proposes a new type of engineering education for universities be introduced from the standpoints of innovative new products. The results discussed here are as follows.

- 1) The development process for new products consists of four stages, namely, target setting, scenario establishment, structuring and validation.
- 2) The former half of the process, target setting and scenario establishment plays a critical role in not only making the layout of the new products best but also allocating the functions of the parts of new products for meeting the targets.
- 3) Students are interested in clarifying the unknown or mechanism of the phenomena they are facing. Such students have the potential for being curious and passionate. Students with curiosity and passion can become self-educators and self-motivators.

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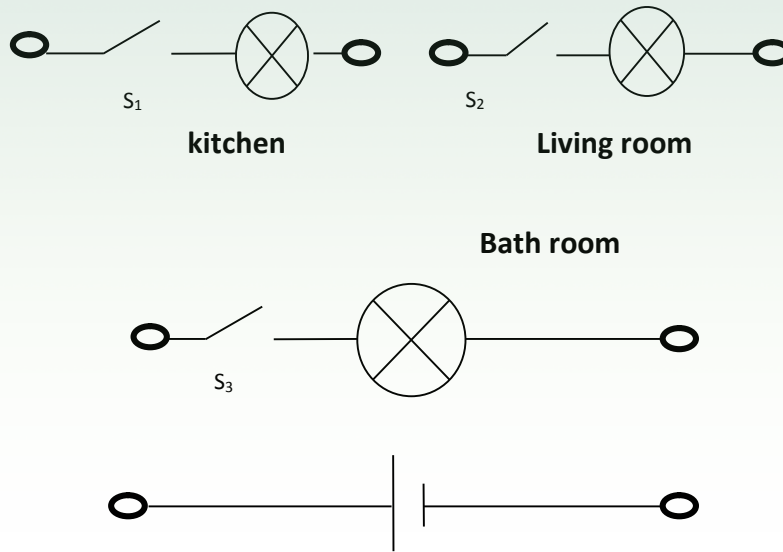


figure4.Circuit board

### 3.3 See session

In SEE session as shown in fig.5 we observe and analyze the video and record findings from observers. Our finding when viewing the video and reading the observations during introduction time in opening part as shown in fig.6 most students were participating actively in answering oral questions and exited by simulation. In main activity as shown in fig.7 all students directly engaged learning process in closing part as shown in fig. 8 teacher ask students to present their finding in front of the class and at the end teacher and students together summerized the lesson.



Fig .5 during see session

Based on Observer-1,observer -2, and observer-3and video analysis on Group -1 We found At the beginning when the group started to construct simple circuit they were confused about the red and black colors of the cable with the hole, which issued to connected one cable with another, most members of the group said the black cable

should fix with black hole others said black cable should connect with red at the end with most of the group agreed to connect black cable with black hole when they did it the lamp light up. But one student from the group wanted to test the connection black cable with red hole but rejected by some members of the group they said already the lamp is turned on but other members said please let us give him chance to let him try.They agreed the student to test it he connected the black cable with red hole and black hole with red cable at the end the lamp light up the group member admired him clap for him and they called him “good boy”. In this experiment the group realized that the color of the cable has not effect to make the lamp turn on. In this experiment what we have seen is first the group raised conflict ideas explained it with supported evidence and gave appreciation and value for those who gave solutions for the problem in democratic way. In this experiment we got findings which are not predicted during plan session because when we make the circuit board for learning material we didn’t give attention for the colors of cables but the students raised it as a problem and solved by themselves.

The students were actively engaged with the learning material. In their daily life the students use switch on and off lamps in their house without realizing it. After the lesson the students got experience on constructing simple electric circuits, series and parallel connection. They also identified the difference between series and parallel connection based on the brightness of the bulbs.

Based on Observer-4,observer-5,and observer 6 and video analysis.group 2were concentrated how to solve the problem and they have solved the four

problems, but observer-4 was focused on one student, who was not even touching the learning material but was taking careful observation on activities took place on the learning material by his group members, at the end when the teacher gave some written questions to be answered based on the experiment already they have done, in one question his group member answered it wrongly. Later on observer-3 asked him that question again orally he answered it correctly, based on his observation. This student couldn't share his idea to his group members for his different answer instead he changed his correct answer by the wrong one because he couldn't get confidence for convincing others.

Based on observer-7, observer 8 and video analysis on group -3 we found that group 3 faced two challenges, the first challenge was while they were constructing simple circuit; the group constructed simple circuit correctly, but the bulb didn't give light after that they discussed where is their mistake they asked the teacher to bring another new lamp and gave them. When they replaced it the lamp light up. From this group the observer found that a problem is existed the group discussed about it and put hypothesis then after tested it finally confirmed their hypothesis was correct. The second challenge was when they construct series circuit they were confused and their connection were wrong. Even both switches were switched OFF the lamps were giving light. After the teacher helped them to follow the procedures in the worksheet they easily correct it



Figure 6. Simulation in introduction



Figure 7. Cooperative learning among students



Figure 8 Students 's presentation in front of the class

The observers suggested that there had been lack of learning materials. All students couldn't get the same chance while constructing a circuit due to limited number of learning materials. in each group there were six students with one learning material. To overcome this barrier more learning materials should be needed for the next lesson. It shown several students still were very eager on engaging the learning materials they were not listen when one presents in front of the class. Therefore the teacher should take serious follow up on students to listen presentation

#### 4 CONCLUSION

Our findings shown that the students' engagement on the learning material, work sheet, and simulation was accomplished successfully. The lesson met the intended learning goals. The students could construct simple electric circuits, series circuit, and parallel circuit and its combination. They also developed understanding about; the materials they need to construct simple electric circuit, difference between open circuit and closed circuit, and the difference behavior of series and parallel circuits, The overall, our lesson shown a remarkable progress in students understanding by applying Inquiry strategy incorporating cooperative learning to enhance student's analysis of electric circuit

The recommendation are 1) if someone intend to use these learning materials, we suggested there should be enough learning materials therefore all student can engage. 2) To make the implementation effective teacher guidance through the process is needed. 3) because the learning material make all the student eager to explore, in the closing session when students present their result and teacher summarization in front of the class make sure all students are paying attention towards the presentation such as students sitting position, should facing in front of the class

## 5 ACKNOWLEDGEMENT

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# Dramatic Play Activity As A Strategy To Develop Children Understanding In Dinosaurs’ Extinction

## A Case Study at GagasCeria Preschool

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**Abstract:** Children can develop better understanding in any concept if it contextual and meaningful for themselves. As additional, children need to be active and enjoy their activities so that concept can be understood easily. Dinosaurs are fun concept for children in 4-5 years aged; they are very enthusiastic and curious on this theme. However, Dinosaurs is abstract concept to connect with real experiences of children. Teachers have to carefully designing the activities so children can get meaningful experiences during the theme. On this case study, the authors will describe about dramatic play activity that selected by teachers to provided the contextual experiences and real sense of the Dinosaurs’ extinction. Class teachers together with participants of Lesson Study discussed the goals of the activity, designed the narrative of the activity, and prepared the materials to support children activity. On post lesson discussion, we found the interactions between imagination, knowledge, and experiences during children dramatic play. Such activity gives benefits for children to develop better understanding about Dinosaurs’ extinction.

**Keywords:** Dramatic play, dinosaurs theme, develop children understanding, contextual experiences, preschool

## 1 INTRODUCTION

In one year term, GagasCeria Preschool has 6 big themes. One of the most favorite themes is a Dinosaurs theme which tells about time and place concept. The students of Awan class can be easily to know the kinds of dinosaurs including their names. The children also looks excited when they were playing the dinosaur’s miniature and playing the role playto show the dinosaur’s power. By the end of the theme, some childrens questioning this question, “Why the dinosaurs has no longer exist?”. This Lesson Study will try to answer the question, according to the question, we designed the strategy to develop children understanding the extinction of dinosaurs.

The dinosaur is a represent of the animal that lived in the past. By using animals as objects of learning, children are expected to be easier to understand the purpose of this theme. The consideration is the children aged 4-5 years are at the pre-stage of the operational cognitive development where the children have been able to understand the symbols. By manipulating symbols in so many ways, children at this age are thinking in a way that

has not been able to do by younger children, that is thinking about something that is not present in sight. (Piaget in Boeree, 2005). We represented the dinosaurs in symbols, such as picture, miniature and lettering.

On this theme, the children could be easy to know the kinds of dinosaur including their name. The children also looked enthusiast when they played a miniature of dinosaur and play dramatization by showing dinosaur’s power. In the end of the theme, there was a question by the children, such as, “Why the dinosaur has no longer existed?”. According to the question, we agreed to make a lesson study to explain about the concept of dinosaur’s extinction, to tell them the time concept that dinosaurs lived in the past.

## 2 A SCENARIO OF DINOSAUR’S THEME

On this Dinosaurs theme, the teachers agreed to introduce some major topic to children for seven weeks. Those topics are explore and find the dinosaurs in the land of Dinosaurs, the concept of

time, introduced similarities and differences between animals in past and present, and also introduced the allegation of the dinosaur’s extinction. Each topic started with brainstorming, namely the process to introduce of initial information about a topic.

### **2.1 Adventure to Dinosaur’s Land Topic (during 1 week)**

At the beginning of the theme, we asked the children to brainstorm about land dinosaurs (the room that we set as a dinosaur’s land) and found the dinosaurs that they want to know.

Their adventure started by following some mysterious footprints. Teachers formerly made a setting room as a land of dinosaurs. The room made with minimal lighting to get a threatening atmosphere. The room decoration was full of trees and hanging roots. Teachers also put some dinosaur’s miniature in the room. Then kids invited to enter the room to explore. Come into the land before dinosaurs, most of the children looked enthusiastic and curious to see the land of dinosaurs.

Some children were looked skeptical and tears when they were in the forest. Some children said that, “I don’t want to get in to the room.” Azki said with her fear face. Meanwhile, Takha’s face was almost crying and said, “That’s dark, I’m scared.” Some of the children actually looked enthusiastic and asked Azki and Takha to come and join into the land, “It’s okay to be here, don’t be afraid, there are a lot of dinosaurs here, come on!” said Elsa to her friends. Finally all of the children came into the dinosaur’s land and found so many kinds of dinosaurs. This condition increased their curiosity to know about dinosaurs that they found. The curiosity of the children seemed in some comments, such as, “Miss, I find a T-Rex, but what is this?” said Mike holding a miniature of triceratops, while Zahra said, “Miss, I don’t know any kinds of dinosaurs, but I want to buy some books of the dinosaurs.” and then Ariana asked this question, “Is this Stegosaurus, right? But why are they having different color?” When they built their own imagination, the teacher began to introduce the kinds of dinosaurs and including their physical features, their habitat, and the concept of time where they lived.

### **2.2 topic of time concept (during 1 week)**

In this topic, children were introduced about the concept of present, past time and also the concept of

the day in a week and the concept of yesterday, today and tomorrow.

### **2.3 Topic of Similarity and Difference of Animal in Present and Past (during 3 weeks)**

In the next topic, the teacher explained about the kind of dinosaurs, physical features and habitat of the dinosaurs. The teacher used some various playing methods to attract their interest to understand and actively involved in the class activities. Some of those methods were exploring the miniature’s dinosaurs, watching movie or video of dinosaurs, pairing a picture (between the name and the kinds of dinosaurs), making a dinosaur’s song, reading a dinosaur’s book, role playing of dinosaur’s life, pictorial, puppet’s storytelling, visiting to the dinosaur’s museum and. After the children know the dinosaurs, the teacher asked them to compare the characteristics of the dinosaurs with the characteristics of animal that lives in the present day.

### **2.4 Topic of The Assumption of Dinosaur’s Extinction (during 1 week)**

A topic about the extinction of dinosaurs was the last topic that we introduced. This topic discussed further more about the concept of place and time of the dinosaur’s life. In early of this topic, the teacher asked the children to watch a film that explained about the cycle of the dinosaur’s extinction, then provided some sequence pictures about the extinction of dinosaurs which will be arranged by the children.

## **3 USING LESSON STUDY TO IMPROVING CHILDREN UNDERSTANDING ABOUT THE EXTINCTION OF DINOSAUR**

The teacher found difficulty on the last topic, which was about how to introduce the concept of dinosaur’s extinction. After some playing methods are used to introduce the concept of dinosaur’s extinction, the teachers thought that children do not fully understand and get the concept. So we agreed to make an open lesson which consists of teachers, school leaders, and education expert, hoping that we could find some possibilities methods for the children to be more understand the concept of dinosaur’s extinction.



At first, we planned to design some activities for open lesson. We agreed to use a role play method about the extinction of dinosaurs in the group time. While in choice time, we opened some choices area, such as arranging the cycle of dinosaur's extinction in literacy area, pairing a dinosaur picture with their name of dinosaur in toys area, and digging some fossils of dinosaur's miniature in discovery area.

Based on our observations, the learning style of children majority were a kinesthetic visual study where they would be faster understand new information through visual stimulative (picture, video, photograph) and motion or direct experience or a kinesthetic felt (senses activity, dancing, and role play), so we decided to use a role play method as a compatible method for children to introducing the concept of dinosaur's extinction. This method facilitate the needs of kinesthetic visual learning style, because there are some move activities such as played act like dinosaurs that they had learned in the previous learning.

In addition, role play activities also facilitate children language development, because the children made a dialogue and expressed the character of the figure that they played. Another benefit of role play is expressing how the children play in their fun activity, pushing activity, the initiative and creativity of children so they can actively participate in learning, and also helps to deprive of a feeling of shame, indisposition and moodiness of the children (Setiyowati, 2013).

According to our discussion, finally we agreed to close choice time area, because the activity that activity in the area was less continuous with the aim of classical activity (group time).

### 3.1 Planning of Lesson Study

Before we designed activities, first we mapped out the goals we want to achieve. As the indicators, we made predictions about behavior and comments that might come from the end of learning as the target/goal this activity. Then on the next step after we made predictions comment, we made the scenario of dramatization activity. As well as making a movie plot, we divided it into a number of chapters, namely the peaceful phase, thrilling phase and extinction phase.

Phase of peace is a phase that the kids were playing the dinosaurs in the stable conditions that they might eat of his food freely, they would life peacefully and well being, because their demand is fulfilled. They were also able to interact with another dinosaurs well.

Meanwhile Thrilling phase is a condition where the earth struced by meteor rain. The forests were getting burned and some dinosaurs injured by meteor. When the time goes by, the food supplies of the herbivore dinosaur was gone. They ran around to save themselves. The last phase is extinction phase where gradually the herbivores dead. The carnivores also ultimately died because there was no longer another dinosaur meat they can eat.

After lesson plan described clearly in every steps, we continued prepared the materials and set room that will support situation of dramatization so that it felt more real by children. These are the material that we set:

- Chosed large room enough for children to move in dramatization.
- Made some life-set area of dinosaurs, such as : sea with pictures of fish, savannah, threes fruits, and pictures of wanted meat.
- Prepared meteors from red and orange balls.
- Prepared lights and wind setting.
- Prepared music effect which accordance for every phase of dramatization.

In this preparation of lesson study, we also determined some tools we used to measure how deep the concept absorbed by the children. We would ask children to draw dramatization situation that they had played then asked them to tell their pictures in front of friends, teachers and observers.

### 3.2 Topic of time concept (during 1 week)

The activity began with circle time. Children sang dinosaur's song, moved like dinosaurs, and played the guesswork game about dinosaurs. The teacher gave prolog that today children will be invited to the role play about dinosaur extinction. After that, dramatization started.

Teachers gave the children opportunity to choose their own dinosaurs characters that they would play. In that time we provided pictures of Triceratops, Brontosaur, Stegosaur, Pteranodon and for they stick in their clothes. After each child had their own dinosaur, the children were invited to sing and dance a dinosaur movement. The teacher repeated briefly stage by stage of dinosaur's extinction in the picture. Children were still focus while listening to the story. After that the dramatization began.

#### 3.2.1 Peace Phase

“Rawr, rawr, nyam..nyam”, said Rakha when he ate some meat.. “I want that meat too.” Said Rizki suddenly came to the crowd. Their body facedown like T-Rex who ate their hunted meat ravenously. After they had satisfied, Takha said, “ I have saturated”. “Lets move to other places” Zahwa added. Then they went to look for some meat in other places. In another side, there were Mike, Ghali and others T-Rex were struggling to get their food.

The Pteranodons such as Adzra, Sakhi and Putra were flying in the edge of the beach. When they saw some fish, Putra said “There are some food. Lets catch them!” Then Pteranodons caught some fish quickly and ate their hunted fish.

In another side of forest, the Brontosaurus were eating leaves and fruits from the tree. “Am, nyam..nyam.. The fruits are so delicious.” Said Dian to other Brontosaurus near her. Then Ken, the male Bronto, came closer and took the fruit that was hanged on the tree.

In the grass field, Triceratops and Stegosaurus were chewing green and fresh grasses ravenously. Kayla, female Triceratops looked so happy when she ate grasses. Her cheeks were puffy. It seemed that her mouth was full of food. When she was eating, Kayla consistently attached her three fingers on her forehead as Triceratops horn.

In that day all of dinosaurs lived quietly and peacefully. They got enough food. They also could take some rest comfortably and played with another until came one time that they have never taught before.

### 3.2.2 Thrilling Phase

At that time, the wind was blowing strong. Leaves and papers were flying into the air. Red and orange balls were thrown from all over the room as meteors which bombarding the earth. The dinosaurs was running arround to get a save place. “Aaa help, help. There’s meteor rain.” shouted Mike, the male T-rex. The dinosaurs felt so scared with that meteor rain. Some of them squated in the room corner as they crossed their hands over their chest. There were also dinosaurs that kept running to look for hiding places.

Suddenly, a T-rex fell because of raging meteors. He didn’t move. “T-Rex is faint” said Aretha, The female Bronto. Other dinosaurs spontaneously

approached T-Rex and tried to wake the predator. Some of them also became weak and some were walking with a limp because they got hit by a meteor. In the midst of heavy meteor shower that attacked the Earth, the dinosaurs continued to attempt to save themselves while also helping fellow dinosaur slowly until finally they fell asleep because of fatigue.

### 3.2.3 Extinction Phase

A few moments they were unconscious. When they woke up, the atmosphere was silence instantly. Butthen the forest, habitat they lived, has been ravaged. In the rest of the energy, they woke up and tried to save themselves. But that happenedoutside their imagination. The meteor rain happened again. This time, it was worse than before.

A meteor attacks over and over again. Fire blazed everywhere, burn all wood and foliage so that no leaves and wood anymore. The dinosaurs could no longer sustain their life. One by one dinosaur large bodied plant-eating died because could not escape from the fire. Overtaken by carnivore’s dinosaurs eventually was gone because there were no herbivores dinosaurs that they could eat. There were no more left over since the events of the meteor shower. The forest was once fertile have become a sea of gray. The lake was no longer watery. Unfortunately, there were no more dinosaurs on Earth. They have become extinct.

### 3.2.4 Review Activities (Through Pictures and Story Telling)

After pretend play, kids are invited to review the activities of dramatization by asking them to retell what they already do in that dramatic play. Children were also asked to tell the feelings they felt when played into adinosaur. To measure the extent to which children's understanding of the concept of dinosaur’s flow extinction, they were asked to draw the flow of dinosaurs’s extinction. They are allowed to choose the most memorable phase for them. After that, they told the picture they have made.

One of the student who was asked to tell the story is Keenan. “Bwonto (Bronto), Pteradon (Pteranodon), T-Rex and Stego. T-Rex eat meat. Brontosaurus eat leaves, then Stegosaurus eat leaves too. Pteranodon eat some fish. There are sun and cloud there. Then all dinosaurs feel happy.” Said Keenan when he told the story. Keenan could

describe and told the peace situation when dinosaurs have enough food to eat and could life calmly.

Another children’s picture that was selected to tell is Sigi’s work. He drew some big circles and some little circles and make random curved lines. Teacher confused with his simply picture because forms he made was unclear delineates dinosaurs. Finally teacher asked him to tell story. “This is the time when the meteor attack. Many of them run because of fear of being attacked. And then no food anymore, then the dinosaur run out.” The teacher asked how was his feelings when he became Triceratops who affected by meteor rain. Sigi said, “I’m sad because of hit by meteor rain.”

### 3.3 Reflection and Discussion: Post Lesson Discussion

According to lesson plans that we made before, we review indicators of children comments that we have written in the lesson plan and we have predicted will be out. We found that almost all of the predictions appear. In pretend play, there was children who commented, “Dinosaurs die because hit by meteor rain.” Venota said. There was also Zahra who commented, “The forest is burned out. Dinosaurs have no more food.” Others children gave various comment. Comments that were said by the children reflected that by dramatization, their language capability is developed. This is because when joined with other children in the dramatization, they will learn to choose and use the words that appropriate with the role that they played (Dodge, Colker & Heroman, 2011).

Mika’s comment that said, “T-rex hungry cause there’s no food so that he die.” appear in dramatization and on the work of a child. We saw activity that dramatization with support condition, children could living up the concept they being learned. The children began to understand the abstract concept.

We see that childrens can more understand the concept of the dinosaur’s extinction. It is visible from more varied work and stories that more complete and flows. Kim (in Bergen : 2002 ) declaring that child in dramatization of can tell the story more and has the ability to tell stories better. The ability to tell stories is necessary to improve the capabilities literacy. A child who performs dramatization can repeat the story more

actively and more complete. It is proven by the story of work from some kids who were more complete if it is compared with the stories work before they made. Child has own sense of the experience of being dinosaurs, so that when the storytelling they can express in a wider what they have experienced. This opinion was expressed also by Dheini (2008) that revealed that one of dramatization benefits is children can understand the contents of the story because play with it.

In post lesson discussion, we saw a child picture example which showed their understanding of the dinosaurs extinction. It makes us agree that dramatization activities with good setting of areas made an abstract concept be more meaningful and contextual for kids.

Based on the results of observations, children looked so animates the role that they played. There were some children who calmly eating grass while remains form horn in her head as triceratops. There were also a child ran in and out as with fear and hiding when meteor rain attacks. During extinct phase, some children pretend to be faintness dinosaurs and there were those who acted like dead dinosaur because he was simply not move.

They use imagination that there was in their minds to involve the life of the dinosaurs. This is in accordance with the definition of dramatization according to Depdikbud in Dhieni (2008) which said that dramatization is playing a role as people or object with the aim to develop imagination and inspiration. Dodge, Colker & Heroman (2011) revealed that, when children play a role, they created the image in their minds about the experiences that they have before and of the situation that they imagine. The outlook for this process is a kind of abstract reasoning.

Behavior that they show in dramatization, is an accumulation of experiences and knowledge which they got in previous lessons. The kids have taught about the type and the characteristics of each dinosaur. So that when they acted like dinosaurs, they could show the behaviors as dinosaurs characteristics they had known. Bergen (2002) said that the qualified pretend play is important facilitator from the perspective taking and further abstract reasoning. The division of time in the dramatization which is divided into three phases makes children easier to understand the process of the extinction of dinosaurs which occurred gradually.

We argue that the effect of dramatization of understanding abstract concept to the extinction of dinosaurs more easily understood children because children get direct experience of the situation of extinction that incremental supported by setting an area in accordance with the condition in every phase. In dramatization, it is visible relations between the imagination, knowledge and experience while children playing a role. So these activities can increase better children understanding about the extinction of dinosaurs.

#### 4 CONCLUSION

Lesson Study team that the election of dramatization method to introduce the concept of dinosaurs extinction is the right methods because with this method children can easily understand the process of the extinction of dinosaurs. Dramatization can develop some developmental aspects such as cognitive, languages, physical and social emotional. This is evident from children's expression of internalization when they played their favorite dinosaurs and commentaries in dramatization which is suitable with teacher taught. Beside of that, the results of work made more varied and more 'rich' than the work before. When they told the story, they could tell you with more spontaneous and more detailed. Because activities that they directly experienced more meaningful to them.

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## Lesson Study in Application of Faculty of Mathematics and Natural Science UNDIKSHA for Development Higher Order Competence and Local Wisdom and Local Genius

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**Abstract:** Activities Lesson study in the FMIPA Undiksha based on internal awareness to develop an innovative model in the professional development of teachers and lecturers in full in accordance with the context of the life of the Indonesian nation. This is done to increase the excellence and competitiveness by FMIPA Undiksha in the global competition. Implementation of lesson study in the FMIPA Undiksha based on the principles of professional development on an ongoing basis-oriented characteristic the following three: (a) Development of higher order competencies; (b) The utilization of information and communication technology (ICT), c) The development of local wisdom and local genius. Results of Lesson Study activities in the form of a real lecture preparation designed collaborative, collegial, and application of innovative learning with Higher Order Competencies, unchanged local wisdom and local genius, and the use of ICT had a positive impact on the learning process. It looks at several indicators such as the following. ( a ) Interaction between students occurs maximally means students are very active in university classes in accordance with the planning of the team. ( b ) The interaction of students with teaching materials is very good as a result of instructional materials prepared in the form of the Student Worksheet and other similar tasks that could challenge the ability of the student . ( c ) The interaction of students with lecture occurs maximally because lecturers are always ready to be a facilitator in the lecture. ( d ) The interaction of students with an excellent environment for learning environments have been designed in such a way that students can learn maximal. ( e ) a model motivated faculty to prepare higher quality lectures. ( f ) The creation of the exchange of knowledge about the students' understanding of thinking and learning . ( g ) the occurrence of collaboration and collegial fellow lecturers . ( h ) Reduce alienation lecturers from the community.

**Keywords:** Lesson Study; higher order competence; local wisdom and local genius

### 1 INTRODUCTION

In accordance with the demands of PP 19/2005 on Teachers and Lecturers, the increase in the professionalism of teachers and lecturers are intact and sustainable is an urgent requirement. One indicator of the professionalism of the faculty can be seen from the quality of her care lecture. Class is a core activity that determines the quality of education in universities. The role of the lecturer is crucial in the process and outcome quality lectures primarily as a facilitator and mentor students in the learning process. Preparation activities in the classroom that are designed and implemented so that the student can empower potential learning outcomes for the better.

During these innovations have been carried out by lecturers in the FMIPA- UNDIKSHA in lectures, for example through research and teaching program in get through various research grants and teaching such , PPKP, Grant A2, DUE -like, I- MHERE, SP4,

funds DIPA . Innovation lecture done by the lecturer during the time in order to research and evaluation after the study was over was done individually by the lecturer concerned, if there is one subject that was raised by more than one lecturer tends in practice carried out separately by dividing the study materials . Lecturers who together guide the team teaching university classes, but its implementation has not been optimized and limited to practical activities . These problems have been tried to overcome through the implementation of lesson study during the last 2 years.

Activity lesson study in the FMIPA- UNDIKSHA based on the internal consciousness to discover-develop an innovative model in the professional development of teachers and lecturers in their entirety in accordance with the context of the life of Indonesian people. This is done to increase the excellence and competitiveness of the FMIPA UNDIKSHA in global competition. The

implementation of lesson study in the FMIPA-UNDIKSHA based on the principles of professionalism in sustainable development-oriented characteristic of the following three .

- a) The development of competence is higher (higher order competencies); through lesson study that educators (teachers and lecturers) are expected and given ample opportunity to innovate collaboratively in order to achieve higher level of competence to increase competitiveness (competitiveness) graduates in this global era.
- b) The utilization of information and communication technology (ICT); through lesson study that educators (teachers and lecturers) are expected to perform a variety of innovations by utilizing ICT, especially in the enrichment of the learning resources, exchange of information and the utilization of shared resources .
- c) The development of local wisdom and local genius. Learning-oriented local wisdom and excellence is an appropriate strategy to increase the excellence and competitiveness of the nation. Because it needs to be grown and fostered a new awareness in order

## 2 IMPLEMENTATION OF LESSON STUDY

Lesson Study Period grants Ganesha University of Education was in 2009 to 2011. Coverage of the courses involved are four (4) departments in the Faculty of Mathematics and Natural Sciences ( Natural Sciences) UNDIKSHA and departments in the Faculty of Sports and Health (FOK) as well as a school that UNDIKSHA high School (SMA) UNDIKSHA Laboratory. Each department in the Faculty UNDIKSHA implement Lesson Study team for 2009 and 2010 is as much as two (2 ) teams per semester while for the third year as one team per semester , so that each department for three years is 10 ( ten ) teams or ten subjects , whereas in FOK conducted at the Department of *Penjaskesrek* is as much a team for 2010 and one for 2011 so the team during this grant there are 40 ( forty ) teams or courses in Natural Sciences and two (2 ) teams or eyes FOK while studying at the Laboratory School Lesson Study activities carried out with funds Faculty Community Service, so that is no longer funded by this activity. Lesson Study activities carried out in the four cycles of plan do see. Participation lecturer for three years in the Faculty already all involved in this team, although not all lecturers had become a model, while in FOK only involved five lecturers .

Implementation of Lesson Study that need to be reported on this occasion is the use of ICT, students

are required to become more ICT literate, as well as other characteristics of Lesson Study in UNDIKSHA that apply the advantage and local knowledge in the relevant courses makes students better understand the linkages science cultivated with wisdom and local advantages, especially in Bali

### 2.1. Progress And Result Have Been Achieved

Lesson Study activities at the FMIPA-UNDIKSHA in fiscal year 2011 can be grouped into two: workshops and implementation of Lesson Study . The results of the workshop are as follows ; a) Understanding FMIPA-UNDIKSHA lecturer about the concepts, principles and practice of Lesson Study has increased . This is demonstrated by the ability of the lecturer to explain the concepts , principles and lecturer lesson study was able to demonstrate the steps of Lesson Study well ; b) The ability of faculty to develop and implement innovative learning models through Lesson Study rise. This is demonstrated by the ability of faculty to develop and implement some innovative learning models such as cooperative learning models , learning cycle model, PBL, and Mathematics Learning Constructivist Perspective Oriented Cognitive Style and Culture (PMKGB) , and others ; c ) Ability to make the college lecturer charged local knowledge through Lesson Study rise. This is demonstrated by the ability of faculty in preparing learning device charged local wisdom such as : RPP , LKM , Hand Out , Textbook , and others .

The results of the implementation of Lesson Study activities activities that have achieved results are as follows : a) The ability of implementing lecture lecturer in charge of local wisdom through Lesson Study rise. This is shown by the integration of local knowledge in each lecture for faculty models tailored to the characteristics of each course . In addition to being able to implement local wisdom - laden lectures , lecturers are also able to develop a learning model that charged local knowledge ; b ) Collegiality among faculty increases. This is indicated by the good cooperation between the lecturers in the preparation of lesson plans, tools, and other lecture material . In addition , through collaboration in terms of improving the quality of learning will be increased collegiality among faculty , especially faculty who engage in Lesson Study activities . With Lesson Study activities will reduce the alienation of lecturers from the community so that there is no gap between lecturers between senior faculty with junior faculty and between superiors and subordinates . This leads to an increase collegiality among person in faculty ; c ) The ability of faculty in developing Higher Order Competencies students

increased . This is demonstrated by the ability of faculty in designing learning such as the preparation of lesson plans , MFI, Instructional Materials, Hand-out, and others have to explicitly load the Higher Order Competencies . In addition, the implementation of learning is also applied to the Higher Order Competencies as planned. One example is the use of Higher Order Competencies in terms of asking questions that do not just ask about the "what" , but has been asking questions about the " why " and " how " . This will affect the thinking ability of students leads to Higher Order Thinking. The ability of faculty in the use of ICT in learning activities is increasing. This is demonstrated by the ability of the faculty in using ICT not just as just like watching a TV show but has been used as cognitive tools ( Cognitive Tool) .

## 2.2 Best Practices

Having regard to the preparations made lecturer in Lesson Study activities are collaborative, collegial , and application of innovative learning with Higher Order Competencies, charged local knowledge, and the use of ICT had a positive impact on the learning process as follows .

- a) The interaction between students occur optimally means that students are very active in following the course in accordance with the planning of the team .
- b) The interaction of students with very good teaching material as a result of teaching materials prepared in the form of MFIs or other similar tasks that could challenge the ability of the student .
- c) The interaction of students with faculty occurs maximally because the lecturer is always ready to be a facilitator in the lecture .
- d) The interaction of students with an excellent environment for learning environments have been designed in such a way that students can learn masimal .

The impact of increasing the quality of learning is characterized in particular in the FMIPA-UNDIKSHA during and after the implementation of Lesson Study activities . In addition to increasing the quality of learning , there is also an increase in the quality of lecturers in the FMIPA-UNDIKSHA which is characterized by the following points .

- a) Motivated lecturers prepare a model for higher quality lectures .
- b) The exchange of experience among students membelajarkan faculty in a collegial group .
- c) The creation of the exchange of knowledge about understanding student thinking and learning .

- d) The occurrence of collaboration and collegial fellow lecturers .
- e) Reduce alienation teachers (from the community).

## 2.3 PROBLEMS IN THE IMPLEMENTATION

There are several obstacles encountered in conducting Lesson Study in Mathematics and Natural Sciences UNDIKSHA are as follows .

- a) The difficulty of presenting all team members complete at each of Lesson Study activities as a result of another task of the institute .
- b) Another difficulty is experienced in integrating local knowledge in a particular topic in courses on subjects such as calculus 2 at the Department of Physics , and several courses in mathematics education majors .

Efforts are being made to overcome the obstacles identified above include:

- a) By taking the course contact hours in the afternoon with fellow team members before discussing Lesson Study .
- b) Equalization of time before scheduling the course of lectures at the Faculty so that all the members are ready to Lesson Study in accordance with the schedule of lectures .
- c) Trying to bring a resource associated local knowledge and then discuss / match between local knowledge along with the lecture material resource.

## 2.2 Plans To Maintain Sustainability

Actions taken with regard to the planned program , among others, as follows .

- a) Implement the plan Lesson Study activities that have been planned in the proposal .
- b) In the long run this policy as a policy set faculties / departments that are supported by all parties , including funds / facilities needed .
- c) Lesson study used a model in coaching students in conducting lectures Teaching and Learning Strategies , micro teaching activities and PPL - Real on the ground , in hopes of fostering pattern himself as a candidate for a professional teacher, will be transmitted and continued after they became a real teacher in the school where they serve

### 3 CONCLUSIONS

Based on the above , it can be concluded that the Lesson Study activities can improve :

- a) Understanding lecturer FMIPA-Undiksha of concepts, principles and practice of Lesson Study,
- b) The ability of the lecturer FMIPA-UNDIKSHA in developing and implementing innovative teaching models ,
- c) The ability of the lecturer in FMIPA-UNDIKSHA laden lectures make the local wisdom,
- d) The ability of the lecturer FMIPA-UNDIKSHA to implement local wisdom and local genius,
- e) Collegiality among faculty ,
- f) The ability of the lecturer FMIPA-UNDIKSHA higher in developing competence ( higher order competencies ) students , and
- g) The ability of the lecturer in FMIPA-UNDIKSHA utilize ICT in learning

#### Recommendation

Based on the results and benefits derived through Lesson Study activities, it is recommended to continue the activities of Lesson Study in Mathematics and Natural Sciences UNDIKSHA and expand targeted to other faculty in Undiksha, as well as to high school



## Improving Students' Interactions In Learning Mathematics Through Lesson Study

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**Abstract:** This article reports a lesson study conducted to improve students' interactions in learning mathematics. Three aspects of students' interactions were assessed: 1) student-student interaction, 2) student-teacher interaction, and 3) students' interaction with learning resources. Three observers and a class of 30 students at PGSD FKIP Syiah Kuala University participated in the study. Prior to the study, the teaching and learning process in the class had been highly dominated by the teacher so that students' interactions were very limited. This condition may be the reason for the students' low achievement in mathematics. Implementation of various teaching strategies through lesson study was conducted as an effort to improve students' interactions. Data was gathered through documentation, observation, and reflective discussion with the observers. During lessons, the observers assessed whether the three aspects of students' interactions took place by giving scores: 1 (almost never), 2 (seldom), 3 (sometimes), 4 (often), and 5 (very often). In the first lesson, the students were asked to work in groups to solve a set of real numbers problems. Data showed that students' interaction with the teacher took place often, but their interaction with their peers and learning resources seldom took place. Despite the instruction to do group discussion, many students worked alone and only shared their answer when they were finished working individually. In the second lesson, Snowball Throwing was implemented. Data showed that the three aspects of students' interactions took place often. In the last meeting, modification of Two Stay Two Stray was employed as the teaching strategy. Data showed that the three aspects of students' interactions took place very often throughout the lesson.

**Key Words:** lesson study, students' interactions

### 1 INTRODUCTION

Basic Mathematics is a compulsory course for first-year students at PGSD FKIP Syiah Kuala University (Primary Teacher Training at the Faculty of Teacher Training and Education, Syiah Kuala University/Unsyiah). It covers number system and number operations among other contents. Good understanding of number system and number operations is crucial for learning other contents in the course and other mathematics courses offered at PGSD. Based on observations conducted at the beginning of Basic Mathematics course in 2013, it appeared that students' understanding of numbers was unsatisfactory. The students did not show thorough understanding of number system, number operations and their properties.

Students' achievement in learning is closely related to how teacher designs the teaching and learning process in the classroom (Wright, Horn, & Sanders, 1997). In Basic Mathematics course at PGSD FKIP Unsyiah, the class usually begun with material presentation by the teacher followed with group assignments and ended with a test which was designed to assess students' understanding of the material. The students would pay attention to the teacher's presentation and do their assignment diligently. But the teacher's domination may have diminished the students' interaction with each other and in turn, hindered students' learning.

Active learning approach proposes that students need to construct their own knowledge and experience it in order to fully understand the knowledge (Brown, 1994; Karpicke, 2012). Engaging students in mathematical activities is a crucial component of teaching mathematics because active learning is the core of meaningful learning (Prince, 2004). Through interactions in the classroom, students gradually build their understanding of mathematics. Therefore the teaching and learning process needs to be designed to assist the students make sense of mathematics.

Three consecutive lesson-study-based sessions reported in this article describe the implementation of active learning approach intended to improve students' interactions in learning real number system at PGSD FKIP Unsyiah. Three aspects of students' interactions were assessed: 1) student-student interaction, 2) student-teacher interaction, and 3) students' interaction with learning resources.

### 2 CONCEPTUAL FRAMEWORK

Lesson study is a continuous process of teachers' professional development through collaborative planning, implementing, observing, evaluating, and revising a lesson and sharing the results (Sato, 2011; Rock, 2003; Ibrohim, 2013; Chassels & Melville, 2009). Lesson study originated from Japan and widely accepted and implemented by educators

around the world. Mathematics teachers in Japan conducted lesson study in their classrooms aiming for two important goals: establish students' interest in mathematics and promote creative mathematical activities (Takahashi, 2006).

The collaborative process of lesson study follows the following stages: 1) formulate learning goals for students; 2) develop lesson plan to address the goals; 3) observe students' interactions during lesson and record students' works which show their understanding; 4) share data; and 5) discuss and analyze the data for next lesson revisions. The whole process is documented to enable the teacher and observers to critically reflect on their professional teaching and development.

### 3 LITERATURE REVIEW

Based on the constructivism philosophy that knowledge cannot be transferred but constructed by learners (Clements & Battista, 1990), teaching and learning process in schools and universities should be carefully designed to facilitate learners constructing their knowledge. Two most important aspects of knowledge constructions are: 1) learners build their knowledge based on their pre-existing knowledge, and 2) learning is an active activity not passive (Hoover, 1996). Even more important in students' learning process is collaboration (Sato, 2011). Through collaboration, students actively express and share ideas and construct their understanding. In other words, students learn when they collaborate.

In the learning process, students interact with the environment in the classroom: the teacher, peers, and learning resources. The quality of the interactions is highly influenced by the teacher's and the students' perspective of the classroom practices and norms (Cobb & Yackel, 1996). For example, students who are used to learn in a conventional classroom are usually confident answering a question asked by the teacher only when they are certain that they have the right answer. They are used to sit down quietly while the teacher is exposing them to content materials and are not used to being asked to express their opinions. These practices can be improved by implementing more interactive teaching and learning activities that allow students to interact with their peers, the teacher, and with the learning resources.

Students' interactions can be facilitated by engaging students to work in pairs or groups and presentations. Silver (2010) reported a study conducted in primary classrooms in America which employ active learning that about sixty percent of the activities in the classrooms is group work and twenty percent is students' explanation or presentation. In group work, students are given the opportunity to work collaboratively, share informations, and

improve their social skills such as respecting others and being tolerant. While during presentation, students improve their communication skills such as expressing ideas, giving statements, and responding to others.

### 4 LESSON STUDY

Lesson study is a professional development model implemented by teachers who are collaboratively and intellectually involved in the act of teaching for understanding aiming to improve students' learning (Lewis, 2002). In lesson study, teachers work together to discuss learning goals, plan lessons to achieve the learning goals, observe the delivery of the lessons, and discuss their observations to refine next lessons (Chassels & Melville, 2009). The practice of lesson study is not meant to criticize teachers, but it is to improve teaching practices (Ibrohim, 2013).

The phases of lesson study according to Lewis (in Ibrohim, 2013) are as follow: 1) forming the team; 2) determining the focus of lesson study: deciding the topic, lesson unit and its goals; 3) planning a lesson corresponding to the learning goals; 4) delivering the lesson and observing the delivery of the lesson; 5) discussing data gained from the observation during lesson delivery; and 6) planning what to do next based on discussion and reflection. In Indonesia, lesson study was introduced by experts from Japan through a development program of mathematics and science for elementary and high school at the end of 2004 (Ibrohim, 2013). A cycle of lesson study encompasses three phases: plan, do, and see.

Ibrohim (2013) explains further the three phases in lesson study: In phase 'plan', lesson study team identifies the problems occur in a classroom and design a good lesson plan to solve the problem. At this phase, lesson content is decided, fitting teaching method is selected, suitable learning sources are organized, and observation sheet is formulated. In phase 'do', model teacher delivers the lesson as planned. The other team members observe the teaching and learning process and make record of the lesson. During the delivery of the lesson, observers are not to interrupt in any way. In phase 'see', the team gathers together to discuss the teaching and learning process started with personal reflection by model teacher. And then one by one the other team members communicate their analysis based on their observation during the delivery of the lesson. Photos and videos are used to clarify statements. Next, the teacher or the team design next lesson plan.

Lesson study benefits all parties involved: the model teacher, fellow teachers, and the students. The model teacher gains advice, assistance, and

suggestion to improve his or her teaching practice; fellow teachers can learn from the observation and discussion processes. Chassels and Melville (2009) state that lesson study provides the opportunity for teachers to build a professional learning community, improve their knowledge of the curriculum and pedagogical knowledge, and develop critical, analytical, and reflective thinking. Lesson study also benefits students, especially preservice teachers. Rock (2003) reports her study on lesson study model for preservice teachers that the collaborative works enhanced preservice teachers’ knowledge, cooperative skills, and professionalism. The participants declared that lesson study gave them the chance to observe, analyze, and understand the development of a lesson plan.

## 5 METHOD

The study was conducted at PGSD FKIP Unsyiah at the beginning of odd semester in the academic year of 2013-2014 in Basic Mathematics Course. Four teachers (one model teacher and three observers) and thirty students participated in the study. The study was organized in three lessons. Each lesson contained the three phases of plan, do, and see as shown in the following figure.

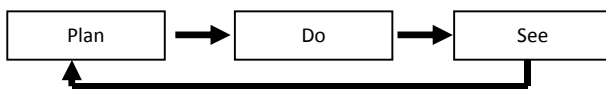


Figure 1. The Procedure of Lesson Study (Ibrohim, 2013)

Data collection for this study was gathered through documentation of teacher’s personal reflection, observation notes, and group discussion throughout the whole process of the lesson study. The focus for this study was students’ interaction: 1) student-student interaction, 2) student-teacher interaction, and 3) students’ interaction with learning resources.

First, the team carefully planned a lesson plan. Next, the model teacher carried out the lesson plan. During the delivery of the lesson, the observers recorded their observation on the observation sheet. Their observation focused on, but not limited to, students’ interaction. They were to give scores 1 (almost never) to 5 (very often) for the three aspects of students’ interaction according to the frequency of the aspects’ occurrence. After the completion of the lesson, all team members gathered in a colloquium to discuss the lesson. Firstly the model teacher submitted a personal reflection detailing her lesson study experience. Then the other team members were to elaborate their observation. The whole discussion was documented as well as the teaching and learning

process. The documents served as the foundation in the planning for next lesson.

## 6 DISCUSSION

### Lesson 1

As the focus of the lesson study was to improve students’ interaction, the team agreed to implement group work and group presentation in Lesson 1. The subject matter was Real Number System encompassing natural numbers, integers, rational and irrational numbers. The learning resources to be used were power point slides, hand-outs, and worksheets. The teaching and learning process in lesson 1 started with the teacher’s statements of learning goals continued with a number game to get the students motivated. Core activities started with teachers’ explanation followed with questions and answers. Then the students were asked to work in groups of 5. The students submitted their worksheets before the lesson ended. Group presentation was canceled due to time limit. The teacher spent more time than was planned in giving explanation at the start of the lesson and allowed too much extra time on the students’ demand in finishing their group task.

In phase ‘see’, the whole team agreed that students’ interaction in Lesson 1 was unsatisfactory. The teacher dominated most of the teaching and learning process. The model teacher expressed that she took a lot of time explaining subject content because the students’ mastery of prerequisite topics prior to learning real numbers was inadequate. She feared that lack of explanation would hinder the students from following the learning activities for the day. The observers argued that student-student interaction only occurred in the last thirty minutes when the students worked together in groups. Even then, discussion was not adequate. Many students did not join the work and merely relied on their friends in completing the group task. On the other hand, the interaction between students and the teacher was fairly satisfactory: the students paid attention to the teacher when she was explaining and they asked and answered questions offered by the teacher. As for the interaction between students with the learning resources, two observers gave score 3 which meant that the interaction only occurred occasionally that was when the teacher asked the students to pay attention to the power point slides. The other observer gave score 2 which meant that the interaction seldom occurred. According to the observer, few students actually paid attention to the learning resources.

During the colloquium session, the team agreed on improvement in teaching strategy to allow student-student interaction, better hand-outs, and better time planning. Special attention should be paid

to student-student interaction and time management. Getting students to get used to finish tasks on time is important. It is not only to make sure that every activity in the lesson plan is carried out, but it is a good habit that students and teachers alike should practice in their daily life.

## Lesson 2

The subject matter for Lesson 2 was real number operations word problems. This was an important and challenging topic. Students usually considered word problems to be difficult and hence lost interest in learning them. On the other hand, word problems hold a very crucial role as a bridge to connect mathematics with real world (Haghverdi, 2012). Word problems present mathematics in real life context. Students' fear of word problems can be reduced if they can see that word problems help them understand the use of mathematics in real life. In planning Lesson 2, the lesson study team intended to give a guessing game at the beginning of the lesson to engage students in learning number operations word problems.

The teaching strategy to be implemented was a modified Snowball Throwing model as an effort to improve student-student interaction. After the guessing game, the teacher would expose the learning objectives for the day which were to solve number operations word problems. Then the teacher would invite the students to collaboratively solve five word problems in front of the class. After that each student would be asked to create two number operations word problems and write them on a piece of paper. The paper would be folded and thrown to other group to be solved individually by the members of the group. After the word problems were solved in a given time, the paper would be returned to the original owner for checking. And finally all papers would be submitted to the teacher. Group presentation would be done by calling a member of every group to present their work in front of the class. The class would be ended with individual evaluation for ten minutes.

Phase 'do' for Lesson 2 was started by dividing the students into five groups of six. The teaching and learning process went nearly according to plan. The opening guessing game caught the students' interest that they actively offered their answers to the question. Visual illustration also helped in engaging the students. On the other hand, the next activity which was the snowball throwing activity took more time than expected because the students needed more time in designing and answering word problems, and also in checking their friends' solution to the word problems. This caused less time for the remaining activities. As a result, group presentation done hastily with no spare time for questions and answers; classical conclusion at the end of the class was

executed hurriedly; and only one out of two planned problems was given for individual evaluation.

Observation showed that the execution of Lesson 2 was better than the previous lesson. The model teacher stated that the students were actively involved in learning and their interactions were improved. On the other side, as the students were not used to word problems, they seemed to find it difficult to design and answer word problems hence they asked for more time to do the task. However, the lesson study team agreed that interaction among students took place very often throughout the lesson. But improvement is needed so that students could collaborate better. The students were not used to communicate freely in a class. Therefore lesson plan revision was needed to allow students to experience a more collaborative learning.

The atmosphere of the class during Lesson 2 seemed to be enjoyable, students participated actively, and the teacher did not dominate the teaching and learning activities. Through the activity of trading word problems, the students shared their existing knowledge. This is a good exercise to help the students be aware of what they know and what they need to learn more. It also helps the teacher to see what the students already understand. During Lesson 2, the interaction between the students and the teacher was satisfactory: the students listened intently to what the teacher had to say and they actively answered questions. During the lesson, the students did not only learn from hand-outs provided by the teacher, but also from their peers through snow ball throwing activity.

Based on the observation, the lesson study team agreed that there were some aspects that needed improvement: 1) students' communication with each other; 2) the teacher needed to be more precise with the time so that the activities designed in the lesson plan could be completed well in order to achieve planned learning goals; 3) provide flipcharts for the students to write their work on so that they would not need more time to rewrite their answers on the board while doing their presentation. There was another finding during Lesson 2: there were some students who were used to ask directly to the teacher whenever they found something they did not understand without trying to figure out it for themselves first. The team worried that this habit may influence students' self confident, collaboration, and their analytical thinking. Therefore, the teacher needed to remind the students to always read information carefully, and practice to understand them on their own carefully.

**Lesson 3**

In phase ‘plan’ for Lesson 3, the team designed the lesson plan to teach properties of real numbers. Modification of Two Stay Two Stray was chosen as the teaching strategy where every student would be given the opportunity to play their role actively in giving information to their peers and also carefully listening to their peers’ explanation. It was crucial to ensure that all the groups would be heterogenic in order to avoid the low achieving students to be selected into the same group. Based on previous observation that the students needed a lot of time in finishing group task, more time was allotted for group work for Lesson 3. Flipcharts were prepared for the students to write their work on. Two worksheets were designed to guide the students in doing their task. The first worksheet was aimed to help students understand the properties of real numbers and the second worksheet was to assist students in visiting other groups.

Phase ‘do’ for Lesson 3 was started with the teacher’s explanation on learning goals for the day. Then the students were divided into two main groups where each group consisted of three smaller groups A, B, and C each consisted of five students. The teacher then gave explanation on one property of real numbers which was the closure property. This activity was followed with questions and answers. Next, the students were asked to work in groups.

Before start working on their task, each member of the groups was given a specific task. First, every group worked on their group completing a worksheet in a given time. Then, three members stayed in their group to explain their work to visitors from other groups while the other two members strayed to other group to listen carefully to the group’s explanation. Then every group member returned to their own group to dispatch information they received from the group that they had visited. The last activity was group presentation.

Observation showed that the execution of Lesson 3 was a lot better on the whole than the previous lessons. The model teacher reflected that each student seemed to study seriously and took responsibility of their own role during the stay and stray activities. The opportunity to share information to others and listening to others’ explanation was conducted sincerely that they must have learnt a lot from each other. The observers agreed that interaction between the students took place very often throughout the lesson. Every single student participated actively playing their role in learning, listening to others’ explanation, and giving explanation to others. Having given a specific job to accomplish, all the students participated seriously during group discussion to make sure that they fully understand the content so that they could pass the information satisfactorily. During presentation, the student who represented their group delivered their conclusion adequately and responded well to other students’ questions and responses. The interaction between the students and the teacher was also satisfactory where the students, as in previous lessons, paid attention to teacher’s explanation, asked questions, and actively answered questions proposed by the teacher. Students’ interaction with learning resources was adequate through hand-outs and worksheets.

During phase ‘see’ for Lesson 3, the lesson study team agreed that the minus thing during the delivery of the lesson was the time management. As in Lessons 1 and 2, group works proved to take more time than anticipated. However, everyone’s time discipline has improved in Lesson 3 so that every planned activity could be completed.

Data shows that there were improvements in students’ interaction in learning mathematics through lesson study at PGSD FKIP Unsyiah. The following table describes those improvements.

Observed aspects	Scores (Lesson1)	Scores (Lesson2)	Scores (Lesson3)
1) Student-student interaction	2	5	5
- Observer 1	3	5	5
- Observer 2	2	4	5
- Observer 3			
2) Student-teacher interaction	4	4	5
- Observer 1	5	5	5
- Observer 2	3	3	5
- Observer 3			
3) Students’ interaction with learning resources (hand-outs, worksheets, etc)	3	4	4
- Observer 1	3	4	4
- Observer 2	2	4	5
- Observer 3			

Each group worked on different task. Group A discussed about commutative properties, group B discussed about associative properties, and group C discussed about identity and inverse properties.

Table 1. The Improvement of Students’ Interactions in Lesson Study Based Learning.

Note: 1 = never; 2 = seldom; 3 = sometimes; 4 = often; 5 = very often

Students' mastery of subject content during the lessons was also assessed using individual assessment instruments given at the end of Lessons 2 and 3. The result showed that 86.7% of the students could answer the assessment in Lesson 2 correctly and 93% in Lesson 3. This information shows that the students understand more when they interact more.

As supporting data, students' responses were also collected at the completion of Lessons 1, 2, and 3 in order to gain insight into how the students felt about participating in a lesson study based learning. The questionnaire asked students' opinion if the teaching and learning process was interesting. For Lesson 1, twenty nine students said that the lesson was interesting because the teacher's explanation was clear and concise that they could understand easily and the mathematical problems were challenging. For Lesson 2, twenty nine students declared that the lesson was interesting because they got to work in groups, decipher and solve word problems, and try to make their own word problems but they wished for more time finishing their work. One person consistently said that the lesson was less interesting because he felt that he could not keep up. For Lesson 3, seven students said that the lesson was very interesting because the activities were varied and fun; twenty two said it was interesting because they got to learn from their peers and the subject content was new to them; and one student still felt that the lesson was not interesting because he was not used to explain knowledge to other people.

Although there was one student who seemed to struggle participating in the study, but he showed improvement in every lesson. He was very quiet and not active during Lesson 1. In Lesson 2, however, he showed more confidence. He stayed close to a friend that he was apparently comfortable with to ask for help when he needed it and the friend was always helping. This showed that the student had initiative to improve himself. Finally in Lesson 3, where every individual was given a certain task, he worked hard to do his task as good as he could. At the end of the lesson, he appeared to be relieved that he managed to complete his task along with the other students.

During colloquium, fellow teachers who acted as observers during the lessons declared that open lessons gave them opportunity to reflect on their own teaching practice and students' learning that they also intended to improve their lesson designs. They agreed that lesson plan revisions were very crucial in determining students' activities. Time management and active learning were very important to make sure that students could learn enjoyably and meaningfully. Teachers needed to facilitate students' interactions in order to help the students build their own knowledge.

## 7 CONCLUSIONS

Lesson study experience enhances academic and social achievement of teachers and students alike. This study provides significance evidence that personal reflection, discussions with colleagues, continuous lesson plan revisions, and listening to students' opinions can improve teachers' teaching practice which in turn could contribute to the improvement of quality of education in schools and universities in Indonesia. Collaborative work between teachers helps maintain good practice of placing students at the core of every learning activity in order to help the students actively construct their knowledge, be aware of their own knowledge construction, and take responsibility in it. Teaching and learning process should provide opportunities for students to make sense of knowledge and learning experience through interaction with each other, with the teacher and learning resources.

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## Lesson Study Solution of Learning Economic Improvement in SMAN 1 Wringinanom Gresik

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**Abstract:** There were many factors cause the low the quality of education. Based on the results of the national examination in 2010, subjects still low, one of these subjects economy. Of factors causing the low test scores national among the learning process in class who not optimal, competence teacher low, device of learning (standard processes), standard education facility and infrastructure and eight educational standards as a whole not fulfill ideal standards. Settlement problems done through priority scale. See the condition in SMAN 1 Wringinanom district Gresik, priority solving problems through improving the learning process in class. Improvement a learning process in class performed with the lesson study. Stages as done 'plan' through focus group discussion 'do' through the learning in the classroom and 'see' do reflection the observation in class. The lesson study exercised effective improve the education quality through improving the quality of learning in class. All parties involved give a positive response really hope can be tried in future time

**Keywords:** Lesson study, learning, economy, high school

### 1. INTRODUCTION

The implementation of the ASEAN Economic Community in 2015 demanding the quality of its human resources ASEAN members should have a good competence. Good competence will be able to win the competition in the region

Indonesia as one of the ASEAN member countries, in the year 2015 will certainly face more severe competition. Currently Indonesia, including the State, who has abundant human resources aspects of the amount, according to data from the Central Bureau of Statistics, (2010) the number of Indonesian population as much as 237 641 326 the soul. The large number of people who do not have a high value, if it has high competence. Improved human resource competence continuing through the development of education. Since the reform era in the development of the education sector has increased significantly. Improvement on all elements of the education system continues to be done.

According Basaruddin, Chan, 2013 describes the Organisation for Economic Cooperation and Development (OECD) periodically measure the quality of education in the country through a program suatau for International Students Assessment (PISA), which measures three basic capabilities, namely reading, math, and science. The results of PISA

2000, 2003, 2004, and 2009 consistently showed, the quality of education in Indonesia is far below the OECD average. Even the test results in 2009 showed that Indonesia was under Cambodia.

According to the Law of the Republic of Indonesia Number 20 Year 2003 on National Education System Article 3 which states that: The National Education serves to develop the ability and character development and civilization of dignity in the context of the intellectual life of the nation, aimed at developing students' potentials in order to become a man of faith and devoted to God Almighty, noble, healthy, knowledgeable, capable, creative, independent, and become citizens of a democratic and accountable. According the Act education should be able to develop the potential of students to even become a man of faith and devoted to God Almighty, noble, healthy, knowledgeable, capable, creative, independent, and become citizens of a democratic and accountable. Indonesian human resources when appropriate with these provisions, is expected to compete in the global era.

The results of the study W.S., Rustono. (2008). among others, an increase in students' ability to apply learning strategies is also a good response from students and teachers on the implementation of Lesson Study in primary schools.



Research Hakim, et al. (2011), describes some basic competence on subjects national tested in 2008, 2009 and 2010 achieving consistency acquire low value. Results of teacher competency test subjects in school national tested the sample in the study Hakim, et al. (2011) obtained an average value of 60, meaning that the teacher's competence can not be considered good. this affects the learning process is done in the classroom.

Conclusions from the study Hakim, et.al (2011, factors that cause the high-low competence mastery of high school students on subjects that national tested, covering all eight national education standards, proving the quality of education is still not able to meet the quality standards education. the recommendations of the study Hakim, et al. (2011), the model it is possible to improve the quality of education that can be done is to improve the implementation of the learning on the subject teachers who national tested.

Darmadi, et al. (2011), Nur, (2011) and Sanusi (2011). That did the Do stage can improve the quality of learning in the classroom. The results of the study Winarsih, (2012) describes the lesson study can improve profesional teachers, improve the process and student learning outcomes. Haryanti, et al. (2013), describes the Lesson study helps faculty and students in learning effectively and efficiently can improve critical thinking skills.

Research Suprpto, (2013) an increase in the competence and professionalism of teachers, improving the quality of processes and outcomes, and the development of democratic learning based on constructivism.

Refers to the phenomenon and the results of these studies Improvement Solutions Learning Lesson Study Economics in SMAN 1 Gresik Wringinanom.

## 2. RESEARCH METHODS

The method of research is a Lesson. Following the steps as follows: first prepare the necessary instrument activities, both to validate the instrument by experts in this regard will be made by the research team, the third stage of coordinating with related parties for the implementation of activities. The next phase of implementation in collaboration with the principal, subject teachers (through MGMPs subjects Economics, and the last stage of evaluation feedback from representatives of teachers and other interested parties).

Lesson Study Implementation Phase include: 1). Activity Focus Group Discussion (FGD), followed by all subject teachers in the sample schools and the UN Department of Education; 2). Implementation of learning observation and reflection, discussion and deepening / recharging materials needed based on the observation; 3). Analysis of student learning

outcomes from the implementation of observation of the implementation of learning.

Draft Evaluation through: 1). Assessment IPKG 1, the completeness of the data analyzed by the percentage of the learning device. Especially for the ability of teachers to develop lesson plans lesson plan are classified as follows: Very well, if  $r \geq 4$ ; Well, if  $3 \leq r < 4$ ; Medium, if  $2 \leq r < 3$ ; Less, if  $1 < r < 2$ ; Very less  $r = 1$ ,  $r =$  the ability of teachers to develop lesson plan (RPP). 2). Assessment IPKG 2, data on the results of classroom observations were analyzed with the following criteria: Very well, if  $m \geq 4$ ; Well, if  $3 \leq m < 4$ ; Medium, if  $2 \leq m < 3$ ; Less, if  $1 < m < 2$ ; Very less  $m = 1$ , with  $m =$  the ability of teachers to teach. 3). Ask for feedback and input from representatives of the participants at the end of the activity (reflection). 4). The response of students towards learning undertaken by teachers.

## 3. RESULT AND DISCUSSION

The location is at the stage of research carried out at the Department of Education Plan Gresik, which was attended by the research team; Chairman / caretaker Economics MGMPs subjects; Principal / representing SMAN 1 Wringin Anom SMA PGRI Kedamaean, SMA YPI Darussalam Cerme Gresik; Economics Teacher subjects came from three sample schools; School Trustees; and the Department of Education (Secondary and Vocational Education) Gresik

### 3.1. Plan

Place the first Implementation Plan activities implemented in Gresik District Education Office on Saturday November 3, 2012 at 8:00 to 12:00 pm. Participants were representatives of the Economic MGMPs SMA Gresik, 4 school superintendent in Gresik, as well as representatives of the school teachers among other samples Wringinanom SMAN 1, SMA and SMA YPI PGRI Kedamean Darussalam Cerme.

Event activities begin with the opening of Plan/briefing, followed present information about lesson study, the procedures for implementation, and preparation of the device followed by a question and answer. This was followed by direct determination of the model teacher participant, determination of SK/KD and materials shall be in accordance with the low value of the National Examination, then participants will be selected to compose the discussion of matter lesson plans with guidance from the facilitator.

The agreement subjects the model teacher Economy Class XII: Sri Wulandari, S. Pd., M.Pd. of SMAN 1 Wringinanom. Plan activities continued with the revision and refinement of the device in

accordance with the advice of teachers and friends advice lecturers.

Of the activity in this group appeared several problems, including (1) Teachers are still hesitant in the preparation of lesson plans, (2) Determination and selection of learning scenarios according to the nature of the material to be delivered.

Solutions were made, namely: (1) RPP directed learning according to the assessment format IPKG 1, (2) Use of media owned and optimize its use in meteri to be practiced to make it more interesting. Assessment results Processing Standards (Completeness Learning Tool) Subject Economics in SMAN 1 Wringinanom data obtained Hakim, et al. (2012) following the completion of learning from data obtained in the subjects of Economics prior to service activities for completeness learning device based assessment IPKG 1 of 2.1, meaning being, and after the service activities obtained values of 3.59 including both criteria, it showed no change and improving the quality of learning devices.

### 3.2. Do

The "do- See" begins with a briefing held at SMAN 1 Wringinanom started at 08.00 and was opened by the Vice Principal of SMAN 1 curriculum areas Drs. Imam Hadi, MM, then performed some guidance related to the implementation of lesson study in the classroom as well as how to fill out observation sheets provided by the researcher. Attended by participants of the lesson study consisted of a team of researchers; XII class model teacher, Vice Principal of SMAN 1 Wringinanom teachers, Observer (subject teachers SMA PGRI Kedamaean Economics, SMA YPI Darussalam Cerme Gresik); and Supervisors.

As the core of the event is the presentation of RPP Briefing by the model teacher of SMAN 1 Wringinanom class XII will be conducted open lessons. After a short break right in the open class to implement the lesson. The workshop participants acting as an observer. Open lesson Do-see done in class XII with 36 people and the number of students led by teacher models. Open lesson done this time is metri cost of goods sold in a trading company with direct instructional model.

Results of classroom observations about the learning processes Hakim, et al. (2012), the data obtained in the classroom learning process in SMAN 1 Wringinanom average value IPKG 2 subjects before the implementation of the Economics of 3.07 and an increase in research activities is 3.64 with a percentage of 91%. This is because teachers try to make learning better and do the maximum with the variation of methods, media and evaluation.

Observations Activities Students in the Learning Process (Do) the second stage of Lesson Study. Hakim, et al. (2012) obtained observations of activity in the social studies class XII students of SMAN 1 Wringinanom in Economics lesson, students begin to concentrate when studying the early events of all students of 30 people that is equal to 100%, the core activities of the observation of as many as 29 students or 96.66% concentrate on learning and concentration that is not only one student or 3.33% and closing as many as 6 people do not concentrate their study in the amount of 20%.

Results Response Students in the Learning Process (Do) in Lesson Study. Hakim, et al. (2012), the subjects in class XII Economics Wringinanom SMAN 1 states that there are 30 students delighted in learning, motivation, and were actively involved in learning by 100% and the students do not find it difficult to learn, the material is too dense and does not feel disturbed in learning as much as 100 % answered no.

### 3.3. See

Advantages of the teacher during the learning process that we can emulate. In taking questions from students with patience and diligence of the students replied to understand.

Valuable experience gained from this learning activity. Can answer all questions about the students both in the book as well as in everyday life.

Based on the minutes of reflection (see) Lesson Study there is some input/suggestions from observers, among others, there are still some students who are not the focus, but students are asked to do in front of no one having trouble, as well as teachers are less able to provide feedback and to give attention to students is uneven. The responses of teachers regarding the implementation of learning models is that he said that no difficulty in teaching the material cost of goods sold in the trading company.

From the implementation of Lesson Study in SMAN 1 Wringinanom for Economic subjects, that most of the students of class XII IPS is pleased to Economic lessons on that day, because the student response data no student is annoyed. Although there are still students who are passive, but no students who have difficulty in accepting material or in doing exercises.

Stages of Lesson Study: Plan, Do, and See proven to improve learning in particular Economics in SMAN 1 Gresik Wringin Anom, this is consistent with studies that have been carried out by a senior official, et al. (2011), Nur (2011) and Sanusi (2011). conducting phases Do can improve the quality of learning in the classroom. Winarsih research results, (2012) describes the lesson study can improve

professional teachers, improve the process and outcomes of student learning. Haryanti, et al. (2013), describes the Lesson study helps faculty and students in learning effectively and efficiently can improve critical thinking skills. The research of Suprpto, (2013) an increase in the competence and professionalism of teachers, quality improvement processes and learning outcomes.

#### 4. CONCLUSIONS

Implementation of Lesson Study has been carried out well and responded very well by the parties involved. The effectiveness of the application of the model implemented in Lesson Study to improve the quality of education can be considered successful. This is evidenced from the results of most of the increase related to the quality of the learning, classroom management, observation of student activities, and student response to learning, and the results of the reflection is done. Habituation make improvements of learning by observing student activity (do) in the stages of lesson study, is a very effective way to provide feedback to teachers, schools and education authorities to improve the quality of education, because this model does not directly blame the teachers or the school or department. Because based on observations of student activity. Reflection is done with a relaxed atmosphere and help each other to improve learning is a place of learning to all those involved.

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## Implementation of Lesson Study in Teaching Assessing Learning (Case Study at Biology Department the Education Faculty of Almuslim University)

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**Abstract:** The study was conducted due to the low quality of teaching and learning process in Assessing Learning. The aims of study were to develop the lecturer’s professionalism, to enhance the quality of the students in learning, lecturer performance in teaching and learning process, and collegiality among lecturers. The study was conducted in 4 cycles. Each cycle consisted of 3 steps, namely plan, do, and see. In planning, a lecturer team held a discussion to prepare a lesson plan. Then, in action, the lesson plan which had been prepared was implemented in teaching assessing learning. In this step involved observers to observe teaching and learning process. In See (reflection) step, the lecturer and observers reflected on the lesson that had been implemented, and then the results were analyzed to improve teaching and learning process in the next cycle. The results of this study showed an improvement in teaching and learning process in each cycle. The study also indicated an improvement on the students to share their ideas in the class. Therefore, the students learned effectively.

**Keywords:** Lesson study, assessing learning

### 1. INTRODUCTION

The study was motivated by the problems that occur in teaching and learning process. The learning process in teaching assessing learning tends to decline in the last two years. It was shown from the students had difficult in generating the ideas in learning process. Therefore, the students were passive in learning process and the interaction in teaching and learning activity focused on the lecturer.

Due to those problems above, students’ outcome in assessing learning course were declined. In addition, the students tend to unable to achieve predetermined competences of the lecture. Therefore, the lecturer needs to improve and enhance teaching and learning process by develops their professionalism. One of the strategies that improve the quality of teaching and learning process was lesson study. Lesson study provide the lecturer to collaborate with another lecturer were acted as observers in teaching and learning activity (Groningen & Sarah, 2012)

Lesson study is a school-based, collaborative and professional development which is introduce by Japanese teachers to develop their teaching and learning in the classroom. Lesson study involves a number of teachers meeting frequently on planning, implementing, observing and reflecting “research

lessons” (Stigler & Hiebert, 1999). According to Lewis & Tsuchida (1998, cited in Rock & Cahty, 2005),

Research lesson are actual classroom lessons, taught to one’s own students, that are (a) focused on a specific teacher-generated problem, goal, or vision of pedagogical practice, (b) carefully planned, usually in collaboration with one or more colleagues, (c) observe by other teachers, (d) recorded for analysis and reflection, and (e) discussed by lesson study group members, other colleagues, administrators, and/or an invited commentator.

Generally, the purpose of the paper is to present lecturer professional development which is developed by the group lecturer of Education Faculty of Almuslim University. Specifically, the aims of the study are to develop lecturer professionalism, to enhance the quality of student learning, lecturer performance in teaching and learning process, and collegiality among lecturers.

### 2. METHOD

The study was conducted in 4 cycles. As can be seen in Figure 1, each cycle consisted of 3 steps, namely plan, do, and see (Saito, *et al.*, 2005, cited in

Santayasa, 2009). In planning step, a lecturer team held a discussion to prepare a lesson plan. Then, in action step was implemented the lesson plan had been prepared in previous step in teaching and learning process. In this step involved observers to observe teaching and learning process. The last step was see (reflection), in this step the lecturer and observers reflected on the lesson that had been implemented, and then the results were analyzed to improve teaching and learning process in the next cycle.

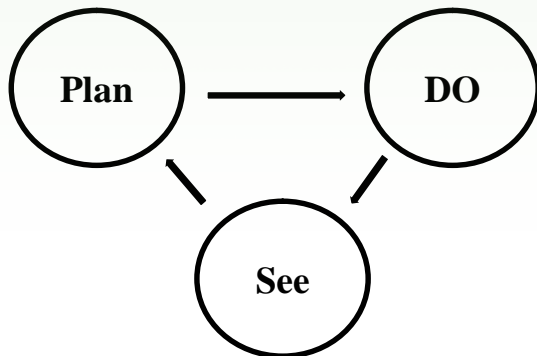


Figure 1 Cycle in lesson study

The study involves a group of lecturers. According to Cerbin and Kopp (2006) said that lesson study teams usually consisted of 3-6 instructors from the same discipline although there could be interdisciplinary teams. Therefore, a group of lecturers in this study consisted of 5 lecturers at Biology Department the Education Faculty of Almuslim University.

### 3. FINDING AND DISCUSSION

#### 3.1 The Description of First Cycle

##### 3.1.1 Planning and presenting the lecture

This study was conducted in assessing learning course of Biology Department the Education Faculty of Almuslim University. The concept that was taught in the first cycle was evaluation in Education. In planning step, a model of lecturer spent his time to plan the lecture. The lecturer prepared lesson plan which included contents and pedagogy, power point, and worksheet.

The model of lecturer then presented and discussed the lesson that had been prepared to the group of lecturers. The members of group proposed several feedbacks to improve the lesson which has been prepared.

The next step was open lesson or implemented, the lecturer asked the students to recall or to brainstorm their memory about definition of

evaluation, measurement, assessment, and test in individually. Based on the result of the students' brainstorm their ability, the lecturer asked the students to formulate about definition of evaluation, measurement, assessment and test in group.

After they had finished their worksheet about definition of evaluation, measurement, assessment and test, the lecturer asked the students to take the conclusion about the advantages and purposes of evaluation in Education in group. After the students discussed in group they should presented their task to another group. The presentation was done through gluing all of the result in the wall. And then, each group should visit and read the result of the other groups. After they read, if the students had the suggestions for the other groups, they should write their suggestions on the paper of the group that they gave the suggestions.

The last step was took the conclusion. In this step the lecturer asked the students to take the conclusion about the material had been they learned. And then, the lecturer gave reinforcement toward the conclusion of the material given. Before the lecturer finished the lecturing, the lecturer asked the students to answer the formative test had been prepared in planning step.

##### 3.1.2 Observing and reflecting the lecture

Open lesson in the first cycle was observed by three observers. Based on the observation, the lecturer and observer did the reflection of the activities. The result of the first cycle as follows below:

1. The students learn the theory only, was not to solve the problems
2. The lecturer had the mistake in giving students' worksheet in groups.
3. Only one student that was active in group 2.
4. Some of the students used hand phone for sending the message.
5. One student came late to the class.
6. Some of the students did not understand what they should do.
7. The students had difficult in giving the ideas.

#### 3.2 The Description of Second Cycle

##### 3.2.1 Planning and presenting the lecture

Second cycle was focused on the materials about the principles of evaluation and clarification of evaluation based on the function of its. Second cycle was conducted to repair the weaknesses in the first cycle. There were some suggestions of the observers in improving the teaching and learning process in the second cycle, such as:

1. The students should can solved the problems were they faced.
2. The lecturer should ask to the students were not use hand phone while they learning in the classroom.
3. Each student in group should have job description.
4. To make the lecturer and also the observers had known the students, the students should use badge.
5. The lecturer must give the name of groups, to make the lecturer organize the students in learning.

In conducting the second open lesson, the lecturer had prepared students’ worksheet that contained of the problems that had been solved by them. The lecturer asked the students to match between two sentences had prepared, so that the students can understood the materials about the principles of evaluation and clarification of assessment based on the function of its. The task can be seen in Figure 2 and 3.

After the students had finished their worksheet in groups, they wrote the result of their job description on the paper. And then, each group should patch the paper on the wall. Then, two of members of each group should stand for in front of their paper on the wall. Those students should present their result of work to another group that visited their group.

### 3.2.2 Observing and reflecting the lecture

As previous cycle, in this cycle also was observed by the observer. There were some notes

were found by the observer during teaching and learning process, such as:

1. The students were active during learning activity.
2. There were some groups did not finish their work on time.
3. The students did use other references in finishing work in groups. They only use the literature had been given by the lecturer. So, the lecturer asked the students to bring another reference or literature for the next meeting.
4. The paper used by the students in writing the result of the discussion was little, so made the students had difficult in looking the result of another group.

Based on the reflection above, concluded that there were some improvement in teaching and learning process than the first cycle.

## 3.3 The Description of Third Cycle

### 3.3.1 Planning and presenting the lecture

In this cycle the materials were given was same in the second cycle about the principles of evaluation and clarification of assessment based on the function. But, the students was conducted was different unit in the second cycle. This suggestion was suggested by the lecturer toward the students two weeks before implemented was conducted, so the students can brought the suitable references were

Ukuri prosedur pembelajaran berikut.

1. Berikan pengertian prinsip-prinsip evaluasi (kolom kiri) berdasarkan kalimat-kalimat yang berada dalam kolom sebelah kanan.

Prinsip-Prinsip Evaluasi	Pengertian
1. Shahih/valid	a. Evaluasi merupakan suatu komponen yang tidak terpisahkan dari kegiatan pembelajaran
2. Objektif	b. Evaluasi didasarkan pada data yang mencerminkan kemampuan yang diukur
3. Adil	c. Evaluasi tidak menguntungkan atau merugikan peserta didik karena kebutuhan khusus serta perbedaan latar belakang agama, suku, budaya, adat-istiadat, status sosial ekonomi dan gender.
4. Terpadu	d. Didasarkan pada prosedur dan kriteria yang jelas tanpa dipengaruhi oleh subjektivitas evaluator.
5. Terbuka	e. Evaluasi dilakukan secara berencana dan bertahap dengan mengikuti langkah-langkah yang baku
6. Menyeluruh & berkesinambungan	f. Prosedur evaluasi, kriteria penilaian, dan dasar pengambilan keputusan dapat diketahui oleh pihak yang berkepentingan.
7. Sistematis	g. Evaluasi dapat dipertanggungjawabkan baik dari segi teknis, prosedur maupun hasil.
8. Beracuan kriteria	h. Evaluasi mencakup semua aspek kompetensi dengan menggunakan berbagai teknik penilaian yang sesuai untuk memantau perkembangan kemajuan peserta didik.
9. Akuntabel	i. Evaluasi didasarkan pada ukuran pencapaian kompetensi yang telah ditetapkan

Figure 2 Students’ worksheet of Evaluation of Instruction

will up there were groups only a half had finished their work.

1. Berikan pengertian jenis-jenis evaluasi berdasarkan fungsinya (Tabel A) berdasarkan kalimat-kalimat yang ada pada Tabel B (satu jenis evaluasi dapat terdiri dari lebih satu kalimat pada tabel B).

TABLE A	
Jenis-jenis evaluasi berdasarkan fungsinya	
1	Diagnostik
2	Formatif
3	Sumatif
4	Selektif
5	Penempatan

TABLE B	
Pengertian	
a	Berfungsi agar guru dapat memperbaiki program dan strategi pembelajaran yang digunakan dalam proses pembelajaran.
b	Penilaian yang dilaksanakan pada akhir unit program.
c	Penilaian berorientasi pada produk, bukan proses
d	Penilaian yang dilaksanakan pada akhir pembelajaran, untuk melihat tingkat keberhasilan pembelajaran itu sendiri.
e	Tujuannya untuk mengetahui hasil yang telah dicapai oleh peserta didik selama program berlangsung.
f	Contohnya, Seleksi penerimaan mahasiswa baru (SPMB) di Perguruan Tinggi.
g	Penilaian berorientasi kepada proses pembelajaran
h	Penilaian yang dilakukan untuk tujuan seleksi.
i	Peaksanaan yang dilaksanakan untuk mengetahui kelemahan-kelemahan peserta didik serta faktor penyebabnya.
j	Penilaian yang ditujukan untuk mengetahui ketarampilan prasyarat yang diperlukan bagi suatu program pembelajaran dan penguasaan belajar seperti yang diprogramkan sebelum memulai kegiatan belajar untuk program itu.
k	Dilaksanakan untuk keperluan bimbingan belajar, remedial dan lain-lain.
l	Dengan perkataan lain, penilaian ini berorientasi kepada kesapan peserta untuk menghadapi program baru dan kecocokan program belajar dengan kemampuan peserta.
m	Soal disusun agar dapat ditemukan jenis kesulitan belajar yang dihadapi peserta didik.

Figure 3 Students' worksheet of Clarification of Assessment based on the Function of its

asked by the lecturer in teaching and learning process took place. Thus, the lecturer prepared the paper was bigger than the second cycle to make the students easy in working the students' worksheet and also in presenting. Besides that, in the process of the instruction the lecturer also remembered the students to manage the time to be effective in working students' worksheet.

### 3.3.2 Observing and reflecting the lecture

Observation in the third cycle was observed by two observers. There were some suggestions were given by the observer in this cycle, such as:

1. The problems were given did not make students to think creatively.
2. The students were not active in learning activities.
3. Some groups did not understand about of each job description.
4. There were some groups did not manage the time was given, when 5 minutes the time

5. Less in giving reward by the lecturer toward the groups or the students had finished the work was good.
6. Require to be emphasized to the students that when their presentation not merely read the result of the discussions but also have to present of it.
7. Not all of the students had read the directions of students' worksheet in beginning work in group.

## 3.4 The Description of Fourth Cycle

### 3.4.1 Planning and presenting the lecture

In the fourth cycle the materials had been taught was focused on evaluation in instruction. Implemented in this cycle was done based on the result of reflection in the third cycle. Therefore, in planning in this cycle had prepared students' worksheet that contained the problems that should

solve by the students in group. The problems were solved by the students using mind mapping strategy. The students were hoped can think creatively in

doing the task or students' worksheet by using mind mapping. There were some vocabulary that must form in main mapping by the students (see Table 1).

Table 1. Vocabulary that must form in main mapping by the students

Isian	Meniru
Kompetensi	Pilihan Ganda
Afektif	Menggunakan
Objektif	Mengingat
Bloom	Menjodohkan
Menganalisis	menciptakan
Tulisan	Naturalisasi
Menerapkan	Tes Standar
Menerima	Mengevaluasi
Mengerti	Menanggapi
Benar Salah	Menganalisis
Psikomotor	Menjadi Pola Hidup
Mengingat	Menghargai
Subjektif	Mengevaluasi
Menerapkan	Revisi Bloom
Buatan guru	Tes Hasil Belajar
Lisan	Essay
Kognitif	Merangkai
Mensintesis	Mengatur Diri
Ketepatan	Memahami

Main mapping had been arranged, should wrote by the students on the paper had been prepared by the lecturer. And then, each group must present the result of their work in front the class. Then, the lecturer asked the students to take the conclusion. After that, the lecturer gave reinforcement toward the materials were given and discussed. The lecturer think this was important if there were students was not understand yet about the material had learn.

### 3.4.2 Observing and reflecting the lecture

In observing step there were two observers. There were some problems were found by the observer in this cycle, such as:

1. There were students' uses the first language when they discuss the task in group.
2. There were two groups not finish the task when the time was up.
3. There were two students in different groups were not active while in doing the task.

## 4. CONCLUSION

The results of this study were showed had the improvement in teaching and learning process of each cycle. The study also was indicated the improvement on students in sharing their ideas in the class. Therefore, the students learned effectively.

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## The Development of Learning Devices of the Environmental Science Course Through Lesson Study Activities

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**Abstract:** This study is aimed to develop the learning devices of the environmental science course through Lesson Study Activities in Biology Education Program of Hamzanwadi School of Teaching Training and Education (STKIP) of Selong. Learning devices developed consist of: syllabus, lesson plans, students worksheet, handouts, and learning instrument. Learning devices which are developed used the Problem Based Learning model combined with Group Investigation which is aimed at improving the critical thinking ability, the cognitive learning outcomes, and the attitudes toward the environment. The subject of the Lesson Study activity I was the second semester students of Biology education program 2012/2013 consisted of 25 people, while the subject of the Lesson Study activity II was the second semester students of Biology education program 2013/2014 numbered 73 people which consisted of two parallel classes. Lesson Study (LS) team of the environmental science course involved six people, consisting of one lecturer model and five observers. The implementation of LS I was 4 cycles and LS II was 16 cycles, in which each cycle consisting of three phases namely Plan, Do and See. The research instrument consisted of: observation sheets and questionnaires to know the learning process which had been carried out and the development product outcomed through LS activities. The data of the learning process related to the process and the learning devices developed were analyzed by qualitative descriptive. Based on the results of Plan, Do and See, there were several findings and improvements, namely: the determination of the appropriate time allocation at the beginning, core, and closing activities, the more communicative of the tasks on the students worksheet so that the students understand what is implemented, the use of the media needed to give the reinforcement to the students, it is necessary to use of technique such as direct designation which makes the students become more active, the learning which involves the students through direct investigation to the object learned can improve the students' learning motivation, the learning which involves the students to solve the environmental issues that are contextually is able to train the critical thinking ability of the students and change the attitudes as well as their views on the environment, the cooperative learning can grow the togetherness among the students, the learning which is carried out through LS as the learning mean for other lecturers which are involved in it and as a mean to develop the better learning.

**Keywords:** Development, Learning Devices, Environmental Science, Lesson Study

### 1. INTRODUCTION

One of the learning standard process mentioned in the Nasional Standards for Higher Education (SNPT 2014) is the plan of the learning process. The plan is outlined in the learning devices compiled by a lecturer or a group of lecturers on a subject.

Based on the observations in biology education program of Hamzanwadi STKIP of Selong, the learning devices of the environmental science course have not been made by the lecturer itself. The syllabus used all this time is taken from the internet without considering whether the materials are appropriate or not with the conditions in East Lombok region. Besides, the process teaching and learning during this time is still conventional, which means that the students are not actively involved in the learning process and have not been trained to solve the

problems that exist in their surrounding. The learning still tends to be teacher centered in which the lecturer as a source of information and the materials being taught are still just a concept which has no relation to the real life.

Especially on the subject of environmental science course which is the subject of expertise in biology education program, the lecturer never use the environment as the learning source whereas the natural potential of East Lombok is very appropriate with the materials of the course. The materials on the environmental science are: natural resources, biodiversity, environmental pollution, environmental degradation, and environmental health.

According to the conditions explained, it needs to be developed the learning devices which are appropriate with the potential environment in East Lombok region through Lesson Study (LS). Lesson Study is one of the development efforts to enhance the

learning process performed by a group of teachers/lecturers collaboratively and sustainable in planning, implementing, observing and reporting the learning outcomes (Syamsuri & Ibrahim, 2008). Hopefully, through the Lesson Study, the quality of teaching in biology education program in general and the environmental science courses in particular, which is still low can be improved. The involvement of other lecturers as the LS team in preparing the lesson plans at the *Plan* stage will train them in designing the course plan that is taught so that the learning devices can be designed by themselves, not just copied and paste from the internet that do not appropriate with the conditions in the college itself. Through Lesson Study, the lecturers can learn together from each other from the learning process implemented, starting from learning designing, learning implementing, including the concepts taught up to the learning outcomes so that the quality of teaching can be improved. The learning devices developed refer to the model of Problem Based Learning combined with Group Investigation which consist of: syllabus, lesson plans, students worksheet, practicum instructions, handouts, assessment instruments of critical thinking ability, instrument of cognitive learning outcomes and attitudes instrument towards the environment.

The syntax model of Problem Based Learning combined with Group Investigation is elaborated in the learning devices developed in the environmental science course that is expected to be able to improve the critical thinking ability, the cognitive learning outcomes, and the attitudes towards the environment.

## 2. RESEARCH METHODS

This research is the development of the learning devices of Problem Based Learning model combined with Group Investigation used to improve the critical thinking ability, the cognitive learning outcomes, and the attitudes towards the environment for the biology students of Hamzanwadi STKIP of Selong. The development of the model refers to the model of Borg & Gall (1983) which is carried out through the Lesson Study activities. The procedural steps are described as follows.

### 2.1 Research & Information Collecting

The stage of needs analysis is set the subject related to the devices to be developed, the literature search, the initial observation, and the designing of research framework. Furthermore, the essential elements related to the product to be developed are collected and analyzed for the purposes of development.

### 2.2 Planning

The planning implemented covers: formulating the objectives to be achieved with the products developed, estimating the funds, manpower, time and capabilities, and arranging the work procedures which cover: (a) the formation of Lesson Study Team, (b) the determination of the place of the meeting, and (c) the planning of meeting schedule.

### 2.3 Developing

The developing of the initial product in the form of the learning devices which consist of: a syllabus, lesson plans, students worksheet, practicum instructions, handouts, and learning instrument. The results of the initial product development are in the form of the draft basic (prototype) of learning devices. Learning devices that were developed using the Problem Based Learning model combined with Group Investigation.

### 2.4 Field Trial

The field trials which were carried out cover: the beginning of field trials through the expert validation, the main field trials and operational field trials which were conducted through Lesson Study activities. The field trials which were conducted was aimed to get the product in the form of effective and acceptable learning devices and able to improve the critical thinking ability, the cognitive learning outcomes and the attitudes towards the environment. The main field trials and operational field trials were conducted through Lesson Study I and II. The design of the implementation of Lesson Study are shown as in Figure 1.

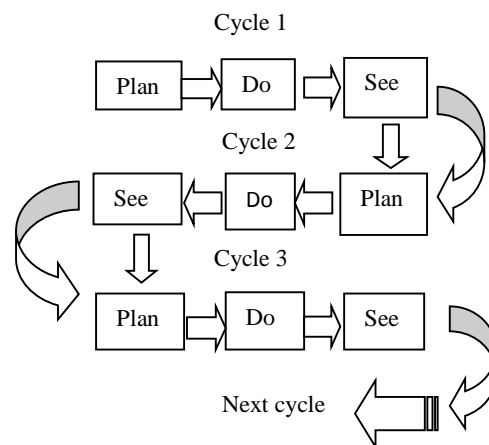


Figure 1. The model of the implementation design of lesson study in the environmental science courses.

The tried subject of the main field test through Lesson Study activities I was the second semester students of biology education program 2012/2013 consisted of 25 people. While, the tried subject of the operational field tests which were conducted through

Lesson Study II was the second semester students of biology education program 2013/2014, consisted of two parallel classes with 73 people. The research instruments were the questionnaires and observation sheet used to collect the information about the learning process that has been conducted and the learning devices that had been developed. The data analysis used was descriptive qualitative technique. The data obtained are the data of learning process that had been implemented through lesson study activities, questionnaire data from the students towards the learning process which had been implemented and learning devices that had been used and the description of the results of the product that had been developed.

**2.4.1 The Process of Development of Learning through the Stages of Lesson Study Activities**

The process of development of learning in Lesson Study activities I was performed 4 cycles. Cycle I discussed about the material of Global Environmental Issues, Cycle II discussed about the material of the Environmental Degradation in East Lombok region, cycle III discussed about the Environmental Pollution which was done through practicum activities, and the Environmental Health.

The process of devices development through Lesson Study activities II was conducted in 16 cycles on two parallel classes. Cycle I discussed about the material of the Ecosystem Components that was taught in class II B, Cycle II discussed about the material of Ecosystem Components that was taught in class II A, Cycle III discussed about the material of Relationships among Organisms that taught in class II B, Cycle IV discussed about the material of Relationships among Organisms that taught in class II A, Cycle V discussed about the material of Biogeochemistry cycles that taught in class II B, Cycle VI discussed about the material of Biogeochemistry cycles that taught in class II A, Cycle VII discussed about the material of Natural Resources that was taught in class II B, Cycle VIII discussed the material of Natural Resources that was taught in class II A, Cycle IX discussed about the material of Global Warming that was taught in class II B, Cycle X discussed about the material of Global Warming that was taught in class II A, Cycle XI discussed about the material of Environmental Degradation that was taught in class II A, Cycle XII discussed about the material of Environmental Degradation that was taught in class II B, Cycle XIII discussed about the material of Environmental Pollution that was taught in class II A, Cycle XIV discussed about the material of Environmental Pollution that was taught in class II B, Cycle XV discussed about the material of Environmental Health that was taught in class II A,

and Cycle XVI discussed about the material of Environmental Health that was taught in class II B.

**3. FINDINGS, DATA ANALYSIS AND PRODUCTS REVISION**

**3.1 Findings and Trial Data Analysis**

Based on the findings of Plan, Do and See which were conducted by a team of LS every cycle in Lesson Study activities I, there are some things found, namely: (1) Cycle I: the instruction on students worksheet number 7 that discussed about the material of Global Environmental Issues was not clear so that the students had not been able to analyze the issues displayed in the video, the time management was not in line with what was planned in lesson plan at the Plan time, (2) Cycle II: The students had not skilled in conducting the discussions, there were many students' misconceptions about the material of the Environmental Degradation, it still needs a technique in order to motivate the students to be active in the learning process, (3) Cycle III: the students' misconceptions still occur in the material of Environmental Health, Cycle IV: the equipments and the materials listed on the practicum instruction were adjusted with the equipments and the materials provided in the laboratory, the students had not been skilled in making the glass slide and doing observation through a microscope.

Based on the learning process that had been carried out, it was obtained the data of the students' questionnaire towards the learning process which had been conducted and learning devices that had been developed through the LS activities I as in Figure 2.

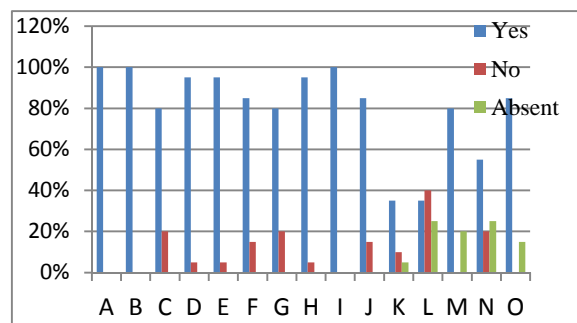


Figure 2. The students' response towards the learning process that had been conducted and learning devices that had been used in the activities of Lesson Study I

**Notes:**

- A = Learning which had been carried out was interesting.
- B = Learning was fun

- C = Learning was easy to understand
- D = Students were motivated to learn
- E = Learning encouraged the students to cooperate with other friends
- F = Learning encouraged the students in independent learning.
- G = Media used was interesting
- H = Media used can help the students to understand the material that learned
- I = Materials written in the students worksheet assisted in learning
- J = Materials written in the students worksheet were easy to understand
- K = Tasks in the students worksheet provided learning challenges.
- L = Assessment and evaluation were conducted transparently
- M = Assessment was appropriate with the material that learned.
- N = Assessment instrument was easy to understand its point.
- O = The questions in the test were appropriate with the competencies required.

The results of the questionnaire towards the learning process that had been implemented through a Problem Based Learning model combined with Group Investigation and learning devices that had been developed in the LS activities I showed that the interesting learning, challenging, motivating the students to learn, training the students to think, training the students to solve problems, training of critical thinking and encouraging the students to cooperate with thier friends when doing an investigation group. Through syntax found in PBL combined with Group Investigation, the students were trained ranging from planning investigation activities that will be carried out, doing an investigations to find out the environmental problems in the region, analyzing and finding the solutions to the problems encountered, as well as presenting what they had been done. This will train the ability to understand, apply, analyze, evaluate and even to create a product from the waste that causes environmental pollution (Supramono 2005, Paidi, 2008, Selcuk and Gahin, 2010). While, the task which was always done in a group would encourage the students to cooperate with the group's friends (Arnyana, 2004; Slavin, 2005). The results of the questionnaire towards the students worksheet which were less clear will be improved at a later stage.

Based on the results of Plan, Do and See which were conducted by a team of LS for each cycle, on the Lesson Study activities II, there were some things found, namely: (1) Cycle I: The learning indicators and learning objectives found in the students worksheet 1 should be adjusted to the lesson plan, the task written on the students worksheet number 4: based on the results of the group investigation, do you

find a balanced ecosystem? It should not be used since the indicator of "balanced" was not clear, it was necessary to determine the time allocation for each group which presented the results of its investigations for 10 minutes of each, (2) Cycle II: the use of time allocation was not in accordance with the plan because of that it was necessary to reduce the number of groups from the eight groups into six groups, there was a misconception on the students, (3) Cycle III: there were two groups who made mistake to report their investigatigation, namely group 3 and 4, they should report the Relationship among Organisms but they reported about the Relationship Between Components of Biotic and Abiotic, (4) Cycle IV: there was still a misconception on the students towards the material of Relationship among Organisms, (5) Cycles V: the distribution of the topics discussed for each group of the students was adjusted to students worksheet 4, namely: group I: Nitrogen-sulfur-water, group II: phosphorus-sulfur-water, group III: carbon-sulfur-water, group IV: carbon-sulfur-nitrogen, group V: phosphorus-nitrogen-water, and group VI: carbon-nitrogen-water, the students' mastery towards the materials was still lack, (6) Cycles VI: the students had not been able to associate three biogeochemical cycles requested, (7) Cycle VII: an indicator of competence and learning goals found in the students worksheet 5 were adjusted to lesson plan, time allocation was adjusted to the material discussed: 5 minutes of initial activities, 75 minutes of core activities and 10 minutes of final activities, the indicator of competence number 8 was repaired for its editorial, (8) Cycle VIII: there were still some students who were not active during the learning process, the solution was that the lecturer model approached the pasive students, the capability to argue, providing the solutions, asking the questions continuously trained to provide the opportunities to the students through discussions and presentations, (9) Cycle IX: a video about the Impact of Global Warming which was played at the beginning and at the end of the learning was seen to motivate the students, it was shown on the students concentration when they watched the video carefully, some students who previously did not dare to argue had begun to dare to give their opinion, (10) Cycle X: the direct appointment technique to the students who asked questions and gave opinions was aimed to provide the opportunities to the passive students to be more active, (11 ) Cycle XI: the students seemed motivated during the learning process since the materials discussed related to the issue that had been observed in East Lombok region, (12) Cycle XII: there was interaction among the students when discussing the environmental issues in East Lombok region, the students were motivated to give their opinion related to the issues encountered during the investigation, (13) Cycle XIII: asking and answering technique needed to be defined so that all students

involved in the discussion, it was used the term of questioner and compulsory responder, the overall students's sitting position was changed into "U" shape that looked more interactive, (14) Cycles XIV: some students who was never active become more active during the learning process because the material discussed covered the issues encountered in their environment although there were some students who still had low ability to ask, (15) Cycle XV: the indicator competency number 3 at Basic Compe-tetion 5: **feeling responsible** towards the environmental health which began from self, family environment to the society was changed to: **grow a sense of responsibility** for the environmental health which began from self, family environment to the society, presentation technique was implemented in two sessions, the first session by group 1, 2 and 3 and the second session followed by groups 4, 5 and 6. Each session was given time allocation for 35 minutes with question and answer process, (16) Cycle XVI: the students had been able to provide the solutions to the problems found in their surrounding environment, the students who was never active become more active with direct appointment technique, the learning which took the real problems encountered in the environment motivated the students to learn.

Based on the learning process which had been carried out, it was obtained the data from the students'questionnaire towards the learning process that had been carried out and the learning devices that had been developed through the LS activities II as shown in Figure 3.

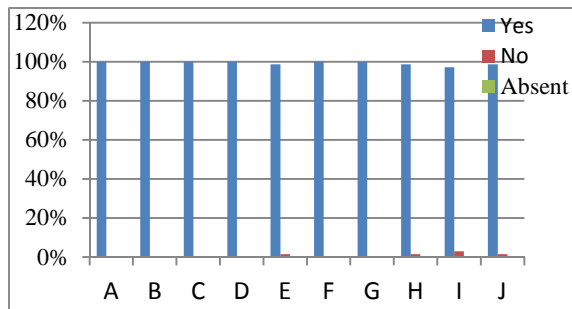


Figure 3. The students' response towards the learning process that had been carried out and the learning devices that had been used in the Lesson Study activities II

**Notes:**

- A = Learning which had been carried out was interesting and challenging.
- B = Learning activities motivated to learn
- C = Process of learning trained oneself to think critically and solve problems
- D = Learning activities trained oneself to express opinions.
- E = Learning activities encouraged to cooperate with friends

- F = Process of learning made the students understand the environmental issues in their region.
- G = Media of learning used was interesting and eased to understand the material that learned
- H = Hand outs used helped in understanding the subject matter
- I = Students worksheet used was easy to understand
- J = The questions provided were related to the issues in East Lombok region (contextual).

The results of the questionnaire towards the learning process that had been carried out through a Problem Based Learning model combined with Group Investigation and learning devices that had been developed in the LS activities II showed the better results than before, as shown in Figure 2, that was the learning which had been conducted was interesting and challenging, motivating to learn, training to think critically and solving problems, training to express opinions, encouraging the cooperation with other friends, making the students understand about the environmental issues in their region, media of learning used was interesting and eased to understand the material learned, hand out helped in understanding the subject matter, the students' worksheet was easy to understand and the questions provided were related to the issues in of East Lombok.

**3.2 Products Revision**

Based on the development that had been carried out, it was presented a revised product that had been carried out, as shown in Table 1.

Table 1. The Learning Devices Before and After Revision.

No	Learning devices	Before revision	After revision
1	Syllabus	Indicator number 11 on Basic Competence 1, material: The Energy Transfer in Ecosystems, namely analyzing the forms of energy transfer in the ecosystem.	Indicator number 11 on Basic Competence 1, material: Energy Transfer in Ecosystems, namely analyzing forms of energy transfer in the ecosystem integrated to the material of Biogeochemistry Cycle with the indicators: describing the relationship between biogeochemistry

			cycle with energy transfer in the ecosystems.			Do you feel the heat lately? Then, the rainy season and the dry season often do not fit with the month estimated, do they? Do you also see the Darmawangi beach where the water has begun to rise? Motivating the students by saying: the earth's temperature that we life has begun to rise, you can imagine the impact, it is very terrible, isn' it?	students by playing a video about global warming.
		The learning experience in the indicator number 1, 2 and 3, Basic Competence 3, the material of the Global Environmental Issues is: finding a solution through group discussion to solve the environmental issues encountered, which were found both in their own environment and globally.	The learning experience in the indicator number 1, 2 and 3, Basic Competence 3, the material is a Global Environmental Issues: <ul style="list-style-type: none"> <li>• Conducting the investigations in the East Lombok region to discover the impact of global warming.</li> <li>• Discussing the results of the group investigation about the environmental issues encountered and discussing how to solve them.</li> </ul>				
2	Lesson Plan	The lesson plan of the third meeting with indicator: energy transfer in ecosystems	The lesson plan of the third meeting with indicator: energy transfer in ecosystem is integrated into the lesson plan 4 about the biogeochemical cycles material into the indicator: describing the relationship between biogeochemical cycle and energy transfer in the ecosystem.				
		Initial activities in the lesson plan for the indicator number 1 up to 4 are written: <ul style="list-style-type: none"> <li>• Brainstorming:</li> </ul>	Initial activities in the lesson plan for the indicator number 1 up to 4 are written: <ul style="list-style-type: none"> <li>• Motivating the</li> </ul>				
				3	Students Worksheet	Task number 4 on the the Students worksheet 1 is written: based on the results of the group investigation, do you find a balanced component?	Task number 4 on the Students worksheet 1 is removed
						The task number 4 on the Students Worksheet 4 is written: write the results of your group discussion and make it in the form of group papers.	The task number 4 on the Students Worksheet 4 is written: Make it in the form of pictures displayed with power point.
						The tasks number 1 and 2 on the Students Worksheet 7 are written: (1) find the information with your group from various sources about the environmental issues that are global, national, and local, (2)	The task number 1 and 2 on the Students Worksheet 7 are written: (1) Discuss with your group the relationship between global warming and coastal erosion in East Lombok region based on the results of

		discuss with your group about the environmental issues which are global, national and local by grouping each of them on a table.	your investigation. (2) Make an analysis about the causes of global warming that occurred at this time. (3) Describe the impact of global warming for life. (4) What solutions do you offer to solve the causes and impacts of global warming?
4	Practicum Instructions	The equipments used for practicum consist of: a light microscope, dry ice, tweezers, hand counter, water bath, glass objects and glass cover, and the pipette.	Alternative 1, The equipments used for practicum consist of: a light microscope, dry ice, tweezers, hand counter, water bath, glass objects and glass cover, and the pipettes. Alternative 2, the equipments used are: light microscope, tweezers, hand counters, glass objects and glass cover, pipettes, test tubes, graduated cylinder, tripco concentric ring, burner bunsen. Graduated cylinder, tripco concentric ring, and burner bunsen are as a substitute of water bath.

Through the Lesson Study activities I and II, it was generated the learning devices that can improve the quality of learning from conventional learning, lecturer-centered, teaching concepts into contextual learning, student-centered, learning to train the ability to argue, analyzing the environmental issues that exist in the students' environment surrounding. This is in line with the statement of Lewis (2002), Sadia (2008), Santyasa (2009), Yumiko and Johanna (2010), that the

Lesson Study is one of the activities aimed at improving the quality of learning and LS can be the basis of learning development.

#### 4. CONCLUSIONS AND RECOMMENDATIONS

Based on the research and development that had been carried out, it can be concluded:

- a. Through the Lesson Study activities, it was obtained the learning devices which based on the implementation of the learning process which was observed and discussed based on the issues encountered by the team of Lesson Study and preparation of the standard device that had been set by the government.
- b. The process of planning, observation and reflection of learning carried out during the activities of LS can be a means to train the lecturers who involved in this activities to review the learning process which was carried out in other subjects.
- c. The development of learning activities through Lesson Study can be done on other subjects in order to improve the quality of learning.

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## Improving The Students' Ability In Critical Thinking At Mechanics Subject Through Lesson Study

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**Abstract:** Based on writer observation in learning teaching process in University Almuslim, shown that the majority of learning still use the conventional method and lecture's oriented. This made students felt bored in accepting lesson and did not give the chance for the students to generate the ideas such as critical thinking. The results of previous research shown that the learning model can improve the students' critical thinking. Therefore, through Lesson Study had been done in Physical Education Program, the writer had done the research to improve students' critical thinking with the aim of to know the improvement of students' critical thinking in studying mechanics through lesson study. In this research the writer used descriptive qualitative method by using Classroom Action Research Procedure. The data obtained by using instrument such as critical thinking test, observation sheet to the teachers and students activities and questionnaires. This research had done to the fifth semester 2013/2014, consists of 36 students. The result shown that the students can improve their skill in critical thinking after the implementation of lesson study. It can be shown of the result in the first cycle there are 7 students were succeed, while in the second cycle there are 33 students were succeed. The result of the lectures and the students' activity also shown that 87% succeed, it is mean that the lecture and the students' activity in criteria good level. Thus, the results concluded that physics learning through lesson study had improved the students' critical thinking in mechanics lesson.

**Keywords:** Critical thinking, Lesson study, Mechanics

### I. INTRODUCTION

Education is something that should be run by the human being from obstetrical until passed away. Long life Education can be gone through formal and non-formal Education. In formal and non-formal Education, such as Elementary School, Junior High School, Senior High School and University. Generally, will give the consequence of quantity form or percentage criterion for each the concepts and the students' ability. These matters make formal Education as a process management of study or Education which is very base on the way in teaching of a educator or teacher. One of the participants is the students. The students also should have the certain skill in expecting the work, so that will support them in working to be the professional worker. The students' ability can be in low or high level. All of depending on the students' skill it self that had learn from the Elementary school until University. In the principal the students always dealt with demand in high critical thinking level, while, in teaching and learning process the lecturer is not give the chance for the students to improve their ability in high critical thinking, so that by itself the ability of students can be low in thinking something. The ability in high critical thinking of the students can improve through the various kinds of the materials or instructions in the

curriculum at Physics Program Education by using the appropriate method or model of the instructions. The ability in high critical thinking of the students also can improve in science instructions. The creativities of the students and the lecturer in preparing the instruction that oriented in high critical thinking of the students are needed. According to Yerigan (2008) states that "the active students can improve their interaction between another student and had high critical thinking in learning the instructions". But, the writer found during teaching and learning process at Physics Program of Almuslim University, shown that many of the lecturers still used the conventional method, such as; speech method in teaching. Kristianingsih et al (2010) said that "caused by the teacher during teaching the instructions used the speech method, so, the students difficult in generating the ideas in improving the application of the concept in their life or in the reality of their life". This activity is different with the purpose of Physics Program in improving the students to master the concepts and can solve the problems in science in their daily life. In fact, the instruction of Physics easier to reach by the teacher or lecturer, as long as the lecturer should lead the students to be active in learning the instruction. The writer's experience during became the head Physics Program at Almuslim University Bireuen Aceh, shown that the lecturer was not care

about the inquiry or problem learning as the fundamental in teaching and learning process. The lecturer still used the conventional method in teaching and learning process as the solution in teaching. It caused the students got a good score “A” only 10% of 40 students as sample. This fact also caused the students’ low ability in high thinking level, which ought to as the students, they should improve their high thinking level such as critical thinking.

Based on the experience and also Lesson Study was accepted by Faculty of Teacher Training and Education of Almuslim University since 2011-2014, the writer and some lecturers work together in creating the new instructions and the writer hopes can improve the mind set of the lecturers and the students in teaching and learning process. The instruction is an instruction that forward the lecturer’s active in preparing the material and media of the instruction and also the students should be active to find out pedagogic concepts through the media had been prepared by the lecturer. The model of the instruction is “Lesson Study”. Lesson Study is one of the models that are active and collaborative in teaching the instruction to be better. Through Lesson Study the lecturer can find out the weakness during teaching and learning process, the lecturer can revised all the problems through the information of the observer. Lesson Study also can make the students more active in the activity in group. Therefore, Lesson Study is a good solution to apply in teaching the instructions at Physics Program which during the time the students were not active to generate ideas, especially in high critical thinking.

Considering to the mechanics is one of the lesson that contains the materials is integrated to other lessons at Physics Program. Hence, the mechanics is as choice in applying Lesson Study. In applying Lesson Study at Physics Program of Almuslim University become a research caused the following problems:

1. How Lesson Study model is used to improve the fifth semester students’ ability in Mechanics?
2. How is Lesson Study model can improve the lecturer and the fifth semester students’ activity in Mechanics?
3. How do the students’ respond toward the implementation of Lesson Study in Mechanics?

Based on the problem above, the writer has some purposes of the research as follows:

1. To know Lesson Study model improve the fifth semester students’ ability in Mechanics.

2. To know Lesson Study model improve the lecturer and the fifth semester students’ activity in Mechanics.
3. To know the students’ response toward the implementation of Lesson Study in Mechanics.

Lesson study is one of the models to make the teacher want to change the way in teaching. Historically Lesson Study is not a model in teaching from Indonesia, but come from Japan. For the first time Lesson Study implemented in Japan in 1990, and than lesson study had been implemented by another country, one of the country is Indonesia. Nevertheless, applying lesson study in Indonesia is not familiar yet, especially at Elementary School teacher, Junior High School teacher and Senior High School teacher. Even though, lesson study is not only the way how to teach the lesson by the teacher but also by the lecturer. According to Rustopo (2007), said that lesson study applied as model to guide the students in improving the students’ ability in applying strategy. So, lesson study can be a model to improve the students that will be the teacher through collaborative instruction and should be continued, depending on the principles of the collaborative in helping each others teacher in improving the teaching and learning process. The principles such as collaborative, continue, and teaching group. Teaching group is used in improving the students’ ability in learning the instruction by the lecturer. Various problems were faced by the lecturer in teaching. Those problems made most of the students had low ability in critical thinking. Based on the fact above, the writer used Lesson Study as a solution to solve the problems in teaching and learning process. Sudrajat (2008) states that “lesson study is one of the efforts in increasing the teaching and learning process through collaborates by a group of teacher”.

Based on the quotation above, the writer concluded that lesson study need teacher team work to reach the target of the study. Moreover, Sudrajat (2008) said explained the purpose of lesson study as follows:

1. To obtain a good comprehend about the students and the teacher in teaching and learning process.
2. To obtain a good result and can be beneficial for another teacher in teaching the instruction.
3. Can improve the instruction systematically through inquiry collaborative.
4. To develop the knowledge of pedagogic, a teacher can learn from another teacher.

Based on the quotation above, can conclude that lesson study model is suitable to be applied to improve teaching and learning process.

### 1. The purpose of Lesson Study

Based on the description of previous point had shown that there were some big purposes of lesson study. Sudrajat (2008) states the purposes of lesson study as follows:

- a. The teacher can evidence the progress of the job.
- b. The teacher can obtain the feed back from the other teachers.
- c. The teacher can expose the result of lesson study.

### 2. Steps of Lesson Study

Mustikasari (2008), states that lesson study is a model in creating the professional teacher through the activities or steps of lesson study and developing the quality of the teachers and students in teaching and learning process. The steps of lesson study are follows: Plan, Do, and See. According to Rahayu (2012) states that in doing lesson study there are three fundamental steps such as; the first, identification the theme of the research. The second, doing the research based on the research theme. And the last is reflecting after done the research. Explanation above shown that in implementing lesson study had three steps that should be followed by the teacher. These steps are integrated with other steps in implementing the lesson study. The process of implementing lesson study as illustrated in this following figure:

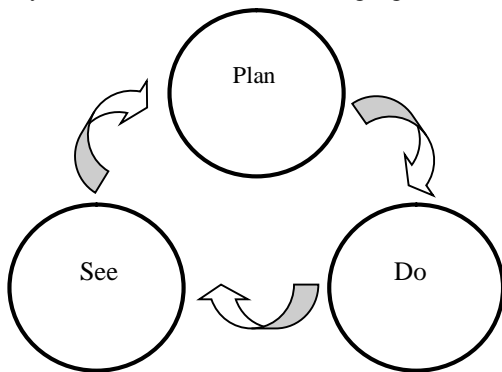


Figure 1 Cycle in lesson study

Where :

1. In stage *plan* the lecture or teacher and observer collaborate to discuss about the solution in solving the problems were faced by the students in the class.
2. In stage *do* the lecture or teacher perform the instruction focused on students centered, while another lecturer or teacher is the observer and should observe all of the activities of the students in learning.

3. In stage *see* the lecture or teacher and the observer formulate the reflecting after done the activity.

### 3. Definition of Critical Thinking

The ability of critical thinking is the ability that should have by the students in critical thinking. Without this ability students had difficult to analyze all of the material concepts in physics. Hassoubah (2002) states that the ability of critical thinking is the process to make the logic decision about something that can be trust. Moreover, Khanafiyah (2011) said that “the ability of critical thinking is the skill of a person in using critical thinking in analyzing the arguments and give the interpretation based on the truth apperception or logical reasoning”.

Based on definition above, states that all of the students had the ability of thinking, but in getting the knowledge the students should not have the appropriate way or method, subsequently, the students did not improve their ability in critical thinking and they did not become a good teacher and can not be professional in their job. According to Setyorini (2011) said that critical thinking can be classification in several skill such as; analysis, focus, observe, hypothesis, assumption, review, take the conclusion, and reflection. Moreover, Sarwi (2012) supposed that five skills in critical thinking, namely 1) giving simple explanation (elementary clarification). 2). Giving depth explanation (in-depth clarification), 3). Making the decision or assessing (judgement). 4). Making the conclusion (inference) 5).Strategic steps (strategies).

## II. RESEARCH METHODOLOGY

This research was conducted at semester III consisted of 40 students in physics program of Almuslim Universitas. There are some factors in this research, such as; firstly, the ability of students’ critical thinking was measured by giving test. Secondly, the activity of the lecturer and students was measured by giving the observation sheet. And lastly, the students’ respond was measured by giving questionnaire.

The design applied in this research was Classroom Action Research. Therefore, in conducting this research the steps as follows: planning, implementing, observing, and reflecting. This research was conducted in two cycles. The data obtain through observation sheet, test, and questionnaire. Test was giving in last meeting of each cycle.

The data from the result of the students' test was analyzed by using the formula proposed by Sudijono (2005).

1. The data the result of the improvement in critical thinking of the students by using the formula proposed by Sudijono to find out the percentage of the students :

$$P = \frac{f}{N} \times 100 \quad \% \quad (\text{Sudijono, 2005})$$

The criterion of success as follows:

75% < NR ≤ 100%	: very good
50% < NR ≤ 75%	: good
25% < NR ≤ 50%	: enough
0% < NR ≤ 25%	: poor

The data the result of the lecture and students' activity by using the formula proposed by Sudijono to find out the percentage as follows:

$$P = \frac{f}{N} \times 100 \quad \% \quad (\text{Sudijono, 2005})$$

### III. FINDING AND DISCUSSION

This research was conducted at physics program of Almuslim University. The research design applied was lesson study. This research focused on improving the students' critical thinking. Based on the steps of lesson study, the researcher was conducted in three steps were plan, do, and see.

#### III.I. analysis of cycle I, II, III, dan IV

##### 1. Plan

Before starting the research, the researcher and the observers discuss about the subject will implementing in open lesson. And then, the researcher and the observer decided mechanics was suitable subject to be research.

In this stage the researcher as acted the lecturer and observers made the plan in preparing lesson plan, students' worksheet, pre-test and media of the instruction. A giving pre-test is to know the basic knowledge of students' critical thinking at mechanics lesson. After prepared all of the instruments, the researcher discussed when the first open lesson is started.

##### 2. Do

In stage Do was focused on teaching and learning process. In this stage the researcher collaborate with 8 observers. Each consisted of two

lecturers of mechanics, two lecturers of basic physics, and three lecturers of thermodynamics. The observers should observe all of the students' activities in their groups and also observe the lecturer' activities. The researcher was a model in this research. For the first time the researcher gave the time among 40 minutes for the students in answering the pre-test was given by the researcher. The pre-test was given to know the basic of students' knowledge before implementing open lesson. After giving the pre-test in the first cycle, the writer started the open lesson activity by using students centered learning. The students were hoped can solve the problem in mechanics lesson had been taught by the lecturer. In the cycle II, III dan IV, the writer also did the same activities such as in the first cycle.

The writer asked to the students of each cycles, they should solved the problems and to find out the concepts that had been taught. After implemented the lesson study the students can solve the problems were they faced and gave the big impact of students' learning. It also had shown members of each group in finishing students' worksheet faster than the time given. The group that faster and correct answers than other groups was given the reward by the lecturer. The lecturer gave mentos and aplos peppermint. This is one way to make the students more interesting, enthusiasm in learning. This activity also did by the researcher in each cycle. In each cycle the researcher always prepared the lesson plan, students' worksheet and the different media of the instruction based on the materials given. In the last meeting of the fourth cycle, the researcher asked to the students to present in the class because the last meeting was gave post-test. Post-test was gave to obtain the students had improved their ability in critical thinking.

##### 3. See

In stage see the researcher and the observers analyzed and made the reflection about the weakness and the strange was found by the observers when open lesson of the first cycle. This activity was done outside the class. Disadvantages and advantages had been reviewed for the lecturer to be applied in the next cycles. At the first cycle the observers found the students were not self confident. This problem made the students had difficult to explore their ability, and then the lecturer should gave the students spirit and bravery for several times to solve the problem and to find out the new concept in their worksheet.

In open lesson activity in the second cycle, the students' confident better than in the first cycle, although was not all of the students. In this activity, the observers found several students were not come on time, so made the activity of groups annoyed.

And then the observers also found there are the instruction in the students’ worksheet had difficult to understand by the students. But another side the students can comprehend the materials given was good.

In open lesson action in the cycle III better than the first and second cycle, but the observers found a weakness, that was the students can not finished their worksheet on time. In this case the researcher explained the factor was media of equipments of electric useful had difficult for the students, but the teaching and learning process take place better than before. It also shown the students’ motivation had improve.

The last was the open lesson activity in the fourth cycle. This activity was conducted in perfect plan. The researcher was found the suitable media in teaching the materials in the fourth cycle. Observer said that there is no more the weakness in the fourth cycle. The observer only found there are one student was come. But teaching and learning process run perfectly, the students’ participation was improved and they enjoy in their activity.

**III.2. Analysis of the students’ ability in critical thinking**

As stated in the previous section this research was focused on students centered learning through lesson study. The activities of lesson study were bottom-up, collaborative, continue and mutual learning became lesson study as a good solution in improving the students’ ability in high critical thinking. This research was conducted at the third semester students at physics program of Almuslim University, shown that had improved the students’ ability in critical thinking. In the first cycle shown that there were some the weaknesses come from the lecturer and also the students. But the weaknesses can solve by the researcher.

In conducting the cycle II until IV, the researcher and 8 observers be able to improve the students in finding the new concepts of the materials, they be able to analyze and explore the ideas in groups. And then the lecturer asked to leader of groups to patch and explain the results were found by them in front of the class. That moment the discussion happened with other groups. The last activity was gave the reward by the lecturer for the groups that be able to finish on time and correct answer of the students’ worksheet.

The result of cycle I until cycle IV, had gave a good impact in improving the students’ ability in critical thinking. The result shown that was 87% students can answer correctly in the pre-test. The result also shown the activity of the lecturer and students had improved through lesson study. The

students’ enthusiastic in learning also had improved. The indicators of critical thinking such as; 1) gave simple explanation (*elementary clarification*), 2). Gave depth explanation (*in-depth clarification*), 3). Made the decision and assessment (*judgement*), 4). Made the conclusion (*inference*), 5). Made the strategic steps (*strategies*). The result of the improvement of the students’ ability in critical thinking, lecturer and students’ activity through lesson study at mechanics subject at the third semester students as follows:

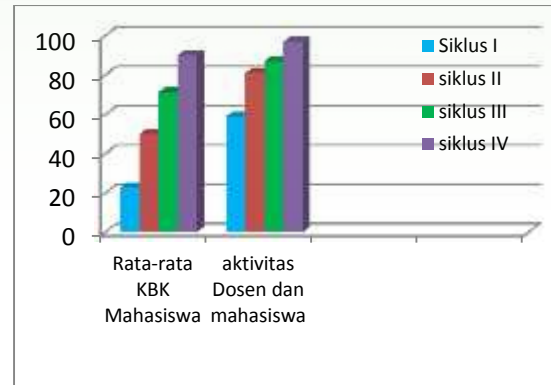


Figure 2. Figure of the result

Based on the figure 1 shown that the mean score of the students’ ability in critical thinking in the cycle I was 22,66, in the cycle II was 50,04, in the cycle III was 71,23 and in the cycle IV was 89,89. The lecturer’ activity in the cycle I was 53%, in the cycle II was 66%, in the cycle III was 82%, and in the cycle IV was 93%. Meanwhile, the students’ activity in the cycle I was 59%, in the cycle II was 81%, in the cycle III was 87%, and in the cycle IV was 97%. The data of figure shown that had improved the students’ ability in critical thinking through the lesson study model activities in mechanics subject at physics program of Almuslim University.

Based on the result, the researcher’s analyze of each the indicators in improving students’ critical thinking. The analysis had shown the improvement of the students’ critical thinking better than before. This ability can made students professional. See the figure of the students’ improvement in critical thinking of each indicator.

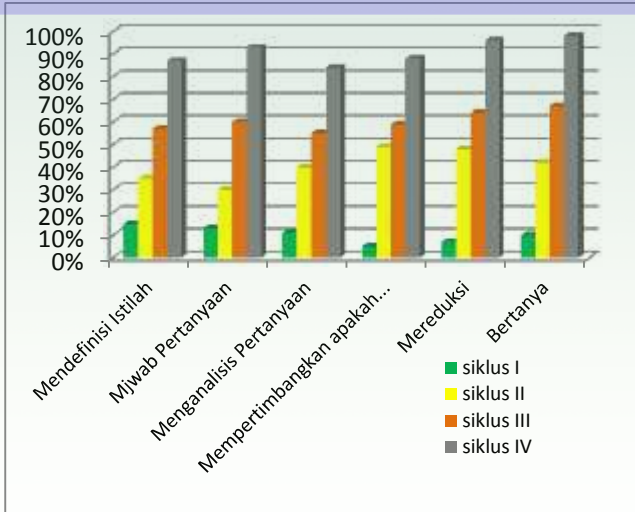


Figure 3. Figure of Analysis students' critical thinking of each indicator

Based on the figure 2, conclude that the significant improvement between the first cycle until the fourth cycle through lesson study. The subject of the research was 40 students. From 40 students can improve the ability in critical thinking in the cycle I was 15%, in the cycle II was 35%, in the cycle III was 57%, and in the cycle IV was 87%. The percentage of the students' ability in answering the correct answer of each cycle were in the cycle I was 13%, in the cycle II was 30%, in the cycle III was 60%, and in the cycle IV was 93%. The percentage of the students' ability in analyzing the questions, in the cycle I was 11%, in the cycle II was 40%, in the cycle III was 55%, and in the cycle IV was 84%. The percentage of the students' ability in considering the truth source or not of each cycle were in the cycle I was 5%, in the cycle II was 49%, in the cycle III was 59%, and in the cycle IV was 88%. The percentage of the students' ability in reducing the question of each cycle were in the cycle I was 7%, in the cycle II was 48%, in the cycle III was 64%, and in the cycle IV was 96%. The last, percentage of the students' ability in asking the question of each cycle were in the cycle siklus I was 10%, in the cycle II was 42%, in the cycle III was 67%, and in the cycle IV was 98%.

The result of the improvement of the students' ability in critical thinking in several aspects such as: gave the description of the terms, answered the question, analyzed the question, considered the truth source or not, reduced and asked the questions of each cycle had shown that implementing lesson study model had been reached the successful.

In conducting the research, the researcher had prepared good Plan. In stage Do the researcher focused on improving the students' ability in learning process and to find out the concepts of the mechanics material. In this activity the researcher

guides the students in analyzing and exploring the ideas through the questions and they should discuss in groups. The last activity was giving reward to the students. Giving the reward for the students can made them more interested in improving their ability in critical thinking. And then the researcher made the reflection. According to Yuan (2008) states that "the instruction that depending on the problem will support the students in learning to improve their ability in critical thinking".

### III.3 Analysis of lecturer and students activity

The successful had explained in point IV.2 shown that the students and lecturer activity in teaching and learning was good. Although, there were some the weaknesses found in the first cycle until the third cycle. But, the weaknesses did not make the students and lecturer low down activity. The result of the students and lecturer activity was obtained from the observation sheet for the students and also the lecturer that had been observed by the observer. Observation sheet had discussed together in stage Plan before the lecture implemented in the stage Do. The result shown that the percentage of the lecturer and students activity in the first cycle was 59.72 % or in low level. While, the percentage of the lecturer and students activity in the second cycle was 81.94% or in good level. In the third and the fourth cycles the percentage of the lecturer and students activity was 87.5% and 97.22% or in very good level. As for, the result of analysis of lecturer and students activity from the cycle I until cycle IV in Figure 4 as follows:

Learning Activity	SM	Cycle 1			Cycle 1			Cycle 1			Cycle 1		
		SP	%	Ket.	SP	%	Ket.	SP	%	Ket.	SP	%	Ket.
Menyusun pengetahuan baru	12	8	66	good	11	91	very good	11	91	Very good	11	92	Very good
Keg. penemuan	12	6	50	enough	6	50	enough	8	67	good	12	100	Very good
Memancing mhs utk mengali sis & ber eksplorasi	12	4	33	enough	9	75	good	10	83	good	11	92	Very good
Mere fleksi Hasil Keg. dlm klp Belajar	12	4	33	enough	9	75	good	10	83	good	12	100	Very good
Penilaian	4	3	75	good	4	100	very good	4	100	Very good	4	100	Very good
Penghargaan	2	2	100	Very good	2	100	very good	2	100	Very good	2	100	Very good
(%)			59,72			81,94			87,5			97,22	

SP : Skor Perolehan  
SM : Skor Maksimum

Figure 4. Analysis of Lecturer and Students activity in Teaching and Learning Process

#### IV. CONCLUSION

Based on the result above, concluded that lesson study can improve the students' ability in critical thinking at the third semester students at physics program of Almuslim University. That was shown of the result in the percentage in improving the students' ability in critical thinking in the first cycle was 22.66%. In the second cycle was 50.04%. In the third cycle was 71.23% and the fourth cycle was 89.89%. The lecturer's activity in the first cycle was 53%, in the second cycle was sebesar 66%, in the third cycle was 82%, and in the fourth cycle was 93%.

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## Implementation of Lesson Study to Increase Student’s Ability in Reading and High Level Thinking

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**Abstract:** The purpose of lesson study implementation in Introduction to Micro Economic lesson is increasing university student’s ability in reading and high level thinking. Besides of that, we hope lesson study activity can increase the lecturer professionalism in recite and solving learning problem in a collaboration manner. Lesson study activity is done in 3 cycles: plan, do, and see. Based on the result of plan activity, learning is designed using cooperative script learning model. The data is gathered through observation paper that filled in by the observer at open lesson moment. The data is analyzed in a qualitative manner with focus on increasing student’s ability in reading and high level thinking. From data analyze, we know that the university student’s ability in reading and high level thinking can increase through cooperative script learning model. The student must study and studied each other with other students in their group. The student must read the subject well. Then the students give the subject by turns and give their main idea each other in a critical and creative manner. Last, they perceive the question and solve the problem that submitted by lecturer and another students.

**Keywords:** reading ability, high level thinking, cooperative script

### 1 INTRODUCTION

Introduction to micro economic lesson is one of mandatory lesson in Economic Education Program in Economic Faculty, Padang State University. Through this lesson, we hope the university student can understand theory and practice about economic base concept, supply and demand, consumer and producer behavior, and how economic activity in various market structure. In an effort to get competence in this lesson, we hope student have an ability to read and understand the lesson subject in a good manner. Then the student should have a high level ability in thinking, so they could understand the implementation of micro economic science in the real practice. High level ability in thinking is using the intelligence in a wider manner to find new challenge, or someone ability in implementation new information or the knowledge before, and manipulation the information to get possibility answer in the new situation (Heong et.al., 2011).

High level ability in thinking can be measured from someone’s ability in critical and creative thinking, and their ability in solving the problem. Critical thinking is an organize process that enable the student to evaluate the evidence, assumption, logic, and language that based on other people thinking (Johnson, 2007). Creative in thinking ability can show by student’s ability in giving new idea, giving the question, brave in experiment and planning the new strategy. Creative thinking include create, find, imagination, estimate, design, giving alternative, make and produce something (Thomas et. al., 2000). Critical and creative thinking can be used

in solving the problem. Problem solving uses existing knowledge and skill to answer the question or the difficult situation (Ormrod, 2009).

Based on observation in teaching Introduction to Micro Economic lesson, we know that university student’s ability in reading and high level thinking relatively not enough. It was shown when lecturer asked student to read subject and cases in the text book. The student relatively could not understand the subject that they read well. The student also could not complete the problems that need high level ability in thinking. In discussion, not all of the student could make the question and give critical and creative answer. All of the phenomena shown that the student could not study well in getting expect competence.

There are many factors that influence student’s ability in reading and high level thinking. Besides internal factor, external factor also have important role to increase student’s ability in reading and high level thinking. Lecturer’s ability in managing the learning process also have important role to motivate the student to increase their ability in reading and high level thinking. Speech method in learning process and variation with question-answer method could not motivate student to increase their ability in reading and high level thinking. It needs an effort to expand and implement variation that could motivate them.

This problem must be solved together by the lecturers who teach Introduction to Micro Economic lesson. This problem can be solved through Lesson Study (LS) activity. Lesson Study is one of an effort to increase learning quality through learning



recitation in collaborative and continuous manner. Lesson Study implementation based on collegiality principles and mutual learning to build learning community. Lesson Study is a model of “teacher professional development”. Through lesson study activity, it is created learning process that could motivate university student to learn in active, creative, effective and pleasure manner through hands-on and mind-on activity, daily life, and local materials. Lewis (2002) said the idea that is contained in lesson study actually brief and simple. If a teacher wants to increase learning process, they have to collaborate with another teacher to design, watch closely, and make reflection to learning process. Sato, Masaaki (2014) said that lesson study is an activity system and philosophy. Activity system include arrange learning plan activity, make open class, make discussion forum and archive the record of learning activity.

Three important things in Lesson Study: plan, do, and see can increase learning quality absolutely. Sato, Masaaki (2014) exacerbate lesson study activity into Plan, Do, See, and Redesign. At Plan stage, teacher discuss and understand the lesson subject, learn the various media and model, and how to do the activity. At Do stage, teacher observe the learning to know whether student have learned through learning design that have been designed before. At See stage, teacher learns about learning activity that have been done and redesign the next learning plan.

Through Lesson Study lecturer can design learning process that makes the student learn each other. In Lesson Study, lecturer attention focuses on student behavior. A model lecturer in the reflection process will explains all of condition that he create to make the student learn, in accordance with the program that have been planned. This is important, because reflection is not aimed to the lecturer’s appearance, but how the lecturer manages learning and student’s activity. With Lesson Study implementation, we expect to change learning paradigm from lecturer centre learning model to student centre learning model. The learning process can increase ability in high level reading and thinking, to explore tendency, solve the problem, or build the concept, in cooperative manner or individual.

## 2 METHOD

The subject in this lesson study is university student at the first semester in Economic Education Program that follows Introduction to Micro Economic lesson. All of the students are 45 people. The lecturer consists of 1 model lecturer, 2 observers, 1 monitoring, and 1 people in documentation.

Lesson study activity is designed into 3 learning cycle. Every cycle consist of Plan, Do, and See

activity. Plan for the first cycle did on Wednesday, November 27th, 2013. Do for the first cycle did on Thursday, November 28th, 2013. Plan for the second cycle did on Wednesday, December 4th, 2013, and Do activity did on Thursday, December 5th, 2013. Last, for the third cycle, Plan activity did on Friday, December 6th, 2013, and Do activity did on Monday, December 9th, 2013. The reflection activity for every cycle did in the end of open lesson activity.

Collecting data are done by using observation technique. Data are collected through observation paper that is filled in by the observer as long as open lesson process. Technique for data analysis use qualitative analysis. Data from observation paper are discussed with the observer in reflection activity. With collaboration, model lecturer and observer collected data, classified them, analyzed, and interpreted the observation result. At the end, we get the conclusion from open lesson activity, suggestion and input for the next better lesson study activity.

## 3 RESULT AND DISCUSSION

Lesson study activity consist of Plan, Do (open lesson), and See (reflection). At the first cycle in Plan activity, model lecturer explained the problem in learning process at Introduction to Micro Economic lesson. Model lecturer explained the lesson design for that lesson, where model lecturer would use cooperative script learning model. Implementation this model absolutely would increase student ability in reading and high level thinking. Observer agreed that model lecturer could use that lesson design.

At the second and the third cycle in Plan activity, model lecturer and observer agreed to put into learning design what is the result of before reflection. The substantive things like making the group and the rule for interaction between groups are the focus in this learning process.

Open lesson activity at the first, the second, and the third cycle are attended by observers and documenter. Model lecturer started learning activity by explaining that open lesson is attended by other lecturer as an observer. After apperception activity, model lecturer asked student to make the group that consist of two persons. Next, students are asked to read the subject in the text book. After that, students are asked to make summary. Then, in every group will be determined who act as speaker and listener. The speaker in every group extended the resume and put main idea into their resume. The listener hear, corrected, and completed main idea if it still incomplete. Next, they changed the place. Implementation of cooperative script learning model would train the student to read precisely and have critical thinking about the subject that they read. In interaction process, student would give input each other. Last, lecturer asked the student to make

question that related to the subject. The question would be answer by the student from another group. Next, together lecturer and student made conclusion about that subject.

Reflection activity in every cycle would be done after open lesson activity. Observation results shown that the interaction will increase between student and student, student and lecturer, or student and text book. Interaction between student and student occur in the group or inter group. Interaction between student and the source of lesson occur when the student read the text book. Interaction between student and student occur when student have to explain the subject and complete each other subject. Interaction between student and lecturer go on learning process. Interaction between one group and another group occur when the group gave and answer the question.

From observation results, we can see that all of the students have learned the subject in every cycle. Small group in cooperative script learning model can motivate student to learn each other. All of the students read the subject although in quantitative manner their ability in understanding the reading not measurable well. Observation results also shown if the student could not read the subject at the time that agreed, lecturer will give the direction so they could read faster. The important thing that we get from this observation is ability in reading fast is needed for the student in learning.

From observation we also can explain student's ability in high level thinking. In a qualitative manner, increasing in student's ability can be measured from the question and the answer that they give. Based on the subject they read, student can submit various questions critically and creatively. Another student must answer this question well, and this question could be critical by the other student. This process could increase student's ability in solving the problem.

We can explain that not all of the students participate actively in discussion, so increasing in student's think ability could not seen individually. It was occur because the limitation of time, so we could not got the chance to discuss with every student. Student's ability in high level thinking to solve the problem also could not be measured well. We suggest the lecturer to prepare some case or problem that need high level thinking.

There are some important things from reflection result. First, making the group must think about heterogeneity of student's ability. There is student that has high interaction because these two groups personal have good academic ability. But there is student that has less interaction because these two groups have lower academic ability. Second, the interaction between the groups must plan precisely, so all of the groups have the same opportunity to

discuss. Third, timing for every stage in learning process must be arranged, for reading, for discussion in group or inter group. Fourth, about student's ability in reading, lecturer must give the direction how to read well. Fifth, about student's ability in high level thinking, lecturer must give explanation about high level thinking aspects that the students need. Last, we need to develop special instrument to measure student's ability in reading and high level thinking.

The implementation result of this lesson study show that collaborative learning especially in small group could increase student's ability in their study. But cooperative script learning model that is used in learning design must modify being collaborative learning. Sato (2014) said this as lesson reformation with collaborative learning. There are some reasons why it is important to implement collaborative learning (Sato, 2014), collaborative learning is a learning essential, create the right to study for every children, tool to improve academic ability, and to guarantee the student that have good academic ability to be better.

The implementation result of lesson study also show that cooperative script learning model create the interaction to teach each other between the students in the group. Actually, it creates the interaction to study each other. Sato (2014) said that the interaction to study each other better than the interaction to teach each other. The interaction to study each other is the mutual relationship that full of honesty. It starts from the student question that they can't understand. Students who understand will help them. The interaction to study each other is suitable with the andragogy learning in university. Pannen (1997) in Suprijanto (2011) said that study for adult correlate with how to direct themselves to ask the question and find the answer. Sato (2014) said the learning (manabi) is when every student meet and dialogue about lesson subject, and although they are not sure, but they start to understand the substance with their own way (dialogue with object), then through collaboration (dialogue with another people), every student build their understanding exactly.

Another discussion is about building the learning that could motivate student to study each other to solve the high and complex problem. Most of the problems arise from the class discussion have not challenge the student yet to solve them using high level thinking ability. Sato (2014) said that in that learning is needed the jumping, it is creative and challenge learning. In triangle model (Sato, 2014) the prerequisite to build learning is an authentic learning, study each other relationship, and jumping learning. It was agreed by Sato (2014) that 3 unsure that affect learning quality are task quality that is given, study in interaction and actively, then

motivation, cognition, and student’s emotional. In an effort to increase student’s thing ability in solving their problem, of course the lecturer needs to prepare the jumping task.

Another thing that must be change is discussion activity. Discussion in group or inter group must direct to hearing each other, not debate or discuss each other. Sato (2014) said that discus each other just express what we have understand. The class is seen very active but most of the learning is not happened. Sato (2014) added that the group who get the learning is the group where the exchange in opinion occurs calmly, and every student hears what their friend say and then think it deeply.

From monitoring result and internal evaluation, we know that lesson study give the big contribution to increase lecturer collaboration in growing up learning quality. The lecturer together can design and develop learning tool that will be used at open lesson. Model lecturer and observer discuss and prepare learning tool that is needed for every “do” activity or learning process. At do activity, model lecturer give learning subject well, related with the “plan” that have been prepared. Model lecturer try in their best way to prepare themselves in teaching, because they will be seen by the observer and recorded by using camera.

“See” activity is a pleasure activity for the lecturer, because they could give input and suggestion each other. Usually, lecturer solves the learning problem individually. Through “see” activity the lecturer give input each other to solve the problem or increase learning quality.

#### 4 CONCLUSIONS

Implementation of lesson study in Introduction to Micro Economic lesson could solve the problem about less ability of the student in reading and high level thinking. Through lesson study, the lecturer collaborates to design learning using cooperative script learning model. From three cycle lesson study activity, in a qualitative manner, based on the observation, we could see that there is an increasing in student’s ability in reading and high level thinking.

The student must read and understand the subject that they read. Student must explain what they know to another student. The other student must listen and add the idea if it is not enough yet. In discussion, the student must submit critical and creative question, and the other student must answer the question better. All of this process could increase student’s ability in solving the problem.

In an effort to increase student’s reading ability, better giving the student the direction about good reading technique. Then we need to explain the question formulation and the answer that can categorized as a high level thinking. In an effort to

increase student’s interaction, lecturer should make heterogeneous group based on student’s learning ability.

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## Reflection of Lesson Study Approach by Pre-Services Science Teacher During Practicum at Selected School

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**Abstract:** Lesson study is a model of teacher professional development in improving teaching and learning process. Advantages of this approach had been proven by the Ministry of Education. They had implemented it at the school level gradually. Science students teacher in the faculty of education are exposed to teach at school as their practicum. Hence, to enhance the development of teaching and learning, lesson study has been applied in the evaluation of learning experience. This study aims to get some response from the students who apply lesson study approach in their training. There were 5 students, 2 teacher, 5 colleagues and 4 lecturers involve in this study. The data consist of observation, structured question and interview. The focus of data is about the main step in lesson study which are preparation of lesson plan, open class and reflection. The finding shows that the students have some positive and negative comment on the application of lesson study. They are different feedback between the applying of the lesson study during micro teaching and practicum in term of certain principle.

**Keywords:** Lesson study, reflection, practicum, pre-service teacher.

### 1 PERKENALAN

Pembinaan tamadun sesebuah bangsa adalah berkait rapat dengan kualiti pendidikan negaranya. Negara yang maju sudah semestinya memiliki tahap pendidikan yang berkualiti untuk melahirkan masyarakat yang berkembang maju. Dalam konteks Negara Malaysia, dasar pendidikan seperti yang dihasratkan dalam Falsafah Pendidikan Negara adalah untuk melahirkan modal insan yang mempunyai minda kelas pertama dan bertaraf dunia. Untuk mencapai hasrat murni itu suatu Pelan Pembangunan Pendidikan (PPP) telah dirangka dan diterbitkan sebagai rujukan semua warga pendidik (KPM, 2013). Pelan tersebut adalah rancangan pembangunan jangka panjang bermula daripada 2013-2015. Ia menggariskan 5 teras utama dan salah satu terasnya ialah untuk meningkatkan keupayaan pengetahuan dan inovasi serta memupuk minda kelas pertama dalam mencapai hasrat negara untuk menjadi negara yang berpendapatan tinggi dan produktif menjelang tahun 2020. Justeru itu individu yang mempunyai ciri-ciri modal insan cemerlang seperti berkemahiran tinggi, boleh bertindak balas dengan pantas dan kreatif terhadap perubahan ekonomi, dan berpaksikan kepada penjana dan penggunaan pengetahuan mampu membangunkan negara dan ekonominya. Oleh yang demikian, satu pendekatan pengajaran yang bersifat holistik yang memenuhi semua keperluan tersebut diperlukan. Kerjasama antara kementerian dan pihak-pihak swasta digalakan bagi pembangunan modal insan ini

melalui transformasi pendidikan. Transformasi pendidikan telah digariskan secara jelas dalam salah satu Bidang Keberhasilan Utama Negara (NKRA). Satu pendekatan pengajaran berasaskan *Lesson Study* cuba diketengahkan kerana ianya diyakini berupaya menggalakkan pembelajaran secara kolaboratif dan berterusan bagi meningkatkan perkembangan ilmu guru, berkongsi pengalaman dan sekaligus dapat meningkatkan kecemerlangan pelajar (Stepanek et al., 2007).

*Lesson Study* merupakan kesinambungan daripada kaedah pengajaran secara kolaboratif dan mempunyai ciri-ciri yang tersendiri. *Lesson Study* yang dijalankan dalam kelas dapat meningkatkan pengalaman pembelajaran guru di samping memperbaiki pengajaran guru. Ianya juga tidak meminggirkan kepentingan pelajar di dalam proses pengajaran. Hal ini kerana penilaian dan refleksi bagi setiap pengajaran bukan sahaja berfokus kepada guru tetapi juga perkembangan pembelajaran pelajar. Selain daripada itu, kaedah pengajaran *lesson study* dapat meneroka idea para guru untuk meningkatkan pemikiran kreatif dan kritis, saling membantu mencari penyelesaian bagi sesuatu masalah serta meluaskan pemahaman, kemahiran dan keupayaan guru dan pelajar (Wiburg dan Brown, 2007).

Sorotan literature menunjukkan bahawa *Lesson Study* telah mula bertapak di Jepun semenjak tahun 1960-an (Fernandez & Yoshida 2004) tetapi menurut Takahashi (2000) mendapati bahawa *Lesson Study* sebenarnya telah bermula pada akhir kurun ke-19. Sungguhpun amalan *Lesson Study* sudah hampir

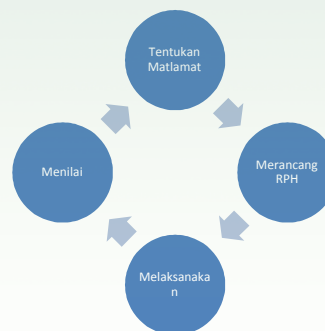
seabad lamanya di negara Jepun tetapi kurang dikenali di peringkat global sehingga akhir tahun 1990-an. Oleh sebab dianggap sebagai suatu amalan biasa, *Lesson Study* menjadi suatu budaya dalam kalangan guru-guru Jepun untuk memperkembangkan profesionalisme keguruan. Dari segi istilah, menurut Yoshida (1999) *Lesson study* diperolehi daripada perkataan Jepun iaitu *Jugyokenkyu* merupakan gabungan dari dua kata *jugyo* yang bererti *lesson* atau pembelajaran, dan *kenkyu* yang bererti *study* atau *research* atau penyelidikan. Oleh itu, *Lesson Study* boleh disimpulkan sebagai suatu kajian atau penelitian terhadap proses pengajaran guru dalam bilik darjah. Melalui aktiviti penelitian tersebut, guru-guru di Jepun mengkaji pembelajaran melalui perancangan dan pemerhatian bersama yang bertujuan untuk memotivasi pelajar untuk aktif belajar secara inkuiri. Dalam konteks dunia global, amalan *Lesson Study* bermula pada tahun 1995 dan menarik perhatian pendidik di Barat secara kebetulan semasa berlangsungnya *The Third International Mathematics and Science Study (TIMSS)* dan kemudiannya diikuti oleh 41 buah negara dan 21 di antaranya memperoleh skor matematik yang lebih tinggi dari Amerika Syarikat. Posisi tersebut membuat Amerika Syarikat melakukan kajian perbandingan pembelajaran matematik di Jepun dan Jerman. Di Jepun, dua penyelidik Amerika Syarikat, Catherine Lewis dan Richard Hiebert, memerhati amalan '*lesson study*' (*jugyoukenkyu*) yang diamalkan secara meluas dalam kalangan guru di sekolah. Daripada kajian perbandingan tersebut, kumpulan penyelidik Amerika Syarikat menyedari bahawa Amerika Syarikat tidak memiliki sistem untuk melakukan peningkatan mutu pembelajaran, sedangkan Jepun dan Jerman telah mengamalkan peningkatan mutu pembelajaran secara berterusan. Oleh kerana itu, para pendidik di Amerika Syarikat telah mula belajar dari Jepun tentang *Lesson Study* dan kemudian mengembangkannya pada beberapa negara lain. Dalam tempoh sembilan tahun yang lalu, *lesson study* telah dibangunkan di beberapa lokasi di Amerika Syarikat. Ia juga digunakan dalam projek Persatuan Kualiti Pendidikan Antarabangsa (IQEA) di England dan Hong Kong. Penyelidikan ini adalah pembangunan pertama penyelidikan dalam lesson study yang dibiayai di UK (Wiburg dan Brown, 2007).

## 2 MODEL LESSON STUDY

Secara umumnya, satu kitaran model *Lesson Study* mengandungi beberapa langkah yang mendorong guru-guru untuk bekerjasama melaksanakan langkah-langkah tersebut. Satu komuniti *lesson study* yang berjaya dibentuk dengan satu kesatuan cita-cita dan matlamat akan

memudahkan pelaksanaannya (Lewis dan Hurd, 2011; Fernandez dan Yoshida 2004). Rajah 1 menunjukkan model kitaran *Lesson Study*.

Rajah 1: Model Kitaran Lesson Study



Langkah pertama adalah menetapkan matlamat pengajaran iaitu dengan mengkaji matlamat jangka panjang untuk perkembangan pembelajaran murid dan kurikulum serta membuat pemerhatian terhadap sukatan pelajaran. Tiga aspek yang perlu diperhatikan iaitu, pertama pencapaian GPMP (Gred Purata Mata Pelajaran) matapelajaran, kedua sasaran ETR (*Expected Targeted Result*) matapelajaran, ketiga jurang antara GPMP pencapaian berbanding sasaran GPMP ETR matapelajaran. Jurang pencapaian tersebut akan dijadikan fokus penelitian dalam *Lesson Study*.

Langkah kedua adalah merancang rancangan pengajaran. Ini memerlukan kumpulan *Lesson Study* untuk memilih topik atau subtopik matapelajaran. Pemilihan mestilah mengambil kira tajuk yang penting, sukar difahami dan topik bukan kegemaran murid, membincangkan masalah pembelajaran murid dan merancang langkah-langkah pembelajaran murid sehingga menghasilkan rancangan pelajaran yang efektif dengan mengambil kira perubahan yang dijangka berlaku kepada murid semasa sesi pengajaran dan pembelajaran dalam kelas terbuka.

Langkah ketiga adalah melaksanakan pengajaran dan pemerhatian yang mana ia memerlukan seorang ahli kumpulan *Lesson Study* yang akan melaksanakan pembelajaran berdasarkan Rancangan Pengajaran yang dihasilkan bersama. Ahli *Lesson Study* yang lain bertindak sebagai pemerhati. Protokol Pencerapan *Lesson Study* semasa sesi pengajaran dan pembelajaran akan melibatkan para pencerap membuat pemerhatian dan mencatat dalam borang pencerapan yang disediakan. Fokus utama diberi kepada pembelajaran murid dan bukan kepada guru yang mengajar. Para pencerap boleh bergerak di dalam bilik darjah untuk meneliti murid membuat kerja latihan tetapi mereka tidak akan campur tangan dalam proses pengajaran dan pembelajaran tersebut. Sekiranya terdapat rakaman video dijalankan, para pencerap diingatkan supaya tidak menghalang rakaman video semasa mereka bergerak dalam bilik darjah manakala ahli *Lesson Study* hendaklah mengumpul data untuk refleksi dan perbincangan.

Langkah keempat adalah menilai refleksi pengajaran yang mana ia hendaklah dilaksanakan pada hari yang sama. Pembelajaran yang dilaksanakan merupakan milik pembelajaran ahli pasukan *Lesson Study* (pembelajaran 'kita' bukan pembelajaran 'saya'). Pengajar diberi kesempatan pertama mengemukakan refleksi. Pengajar hendaklah memberi refleksi sendiri berkenaan dengan pengajaran-pembelajaran berdasarkan apa yang telah berlaku dalam kelas daripada aspek kekuatan dan kelemahan. Para ahli pasukan berbincang dari aspek keberkesanan pengajaran-pembelajaran, termasuk penglibatan murid, tingkah laku, maklum balas, kerja latihan dan lain-lain aspek pembelajaran murid yang berkaitan. Ketua pasukan memainkan peranan sebagai moderator dalam perbincangan. Beliau memastikan penglibatan secara menyeluruh dalam kalangan semua ahli pasukan semasa perbincangan. Pakar rujuk tidak perlu terlalu menonjolkan diri semasa memberi input dan pandangan. Suasana seperti itu perlu bagi menggalakkan perbincangan yang terbuka dan mesra. Para ahli pasukan *Lesson Study* perlu membincangkan kelemahan, membuat dan penambahbaikan kerana dapatan tersebut akan dapat meningkatkan rancangan pengajaran yang efektif serta pembelajaran murid. Bagi langkah kaji semula pengajaran, rancangan mengajar berkenaan boleh diterima tanpa pembetulan, diterima dengan pembetulan atau pun ditolak. Sekiranya perlu, pasukan *Lesson Study* boleh mencadangkan supaya rancangan mengajar berkenaan dibuat semula dan diajarkan semula kepada kelas yang lain oleh ahli *Lesson Study* yang lain. Rancangan mengajar berkenaan disimpan sebagai rekod untuk dokumentasi (Lewis dan Hurd, 2011).

Komponen teras bagi kaedah *lesson study* menekankan untuk bekerja dalam mod penyelidikan secara bersama-sama. Tujuannya adalah untuk mengenal pasti apa yang mahu dipelajari, mengapa dan apa yang menjadi tumpuan penyelidikan atau siasatan. Pemerhatian dilakukan dalam satu kumpulan yang terdiri daripada beberapa orang guru dan data direkodkan. Kemudian, perbincangan, analisis dan rakaman dilakukan dari apa yang telah dipelajari oleh pelajar dan penyelidik. Mereka merekod dan menganalisis amalan dan atau data contohnya menggunakan video, audio atau imej pegun. Akhir sekali, laporan akan disediakan untuk menyampaikan kaedah ini sama ada dalam mesyuarat kakitangan, PowerPoint, video dan panduan kejurulatihan serta dapat menggunakan ia untuk pengajaran yang sebenar (Zanaton Iksan, 2014; Lewis dan Hurd, 2011; Lewis, 2002 & Lewis, & Tsuchida, 1997).

### 3 LATAR BELAKANG KAJIAN DAN PERNYATAAN MASALAH

Dalam kerangka untuk melahirkan guru yang terlatih dan kompeten, peranan universiti secara amnya dan peranan fakulti pendidikan masing-masing universiti secara khusus harus mempunyai suatu dasar dan kurikulum yang mantap yang diterapkan kepada guru-guru pelatih. Justeru itu segala bentuk pembaharuan, inovas dan pendekatan pengajaran semestinya diperkenalkan pada peringkat pengajian prasiswazah lagi. Dalam konteks yang lebih khusus, Fakulti Pendidikan Universiti Kebangsaan Malaysia (UKM) yang melatih bakal-bakal guru dalam bidang pengkhususan seperti TESL (*Teaching English as Second Language*), Pendidikan Khas, Pendidikan Sukan dan Rekreasi dan Pendidikan Sains telah cuba menerapkan pendekatan *Lesson Study* melalui subjek Kurikulum dan Pedagogi dan Latihan Mengajar. Bakal-bakal guru atau dikenali juga sebagai guru pelatih telah diberikan pengalaman pengajaran secara terus di sekolah-sekolah terpilih selama 16 minggu. Amalan pengajaran selama ini berasaskan kepada pendekatan *Peer Coaching and Mentoring* yang sedikit berbeza dengan pendekatan *Lesson Study*. Menurut Loucks-Horsley et al. (1997) pendekatan secara permentoran lebih kepada latihan dan bimbingan dari rakan yang lebih senior secara perseorangan berbanding dengan pendekatan secara *Lesson Study* yang menekankan kepada proses pengajaran. Satu komuniti *Lesson Study* perlu diwujudkan dalam sesebuah sekolah bagi menyokong pelaksanaan pendekatan ini. Dalam amalan pengajaran yang di amalkan sekarang, wujud jurang antara pendekatan secara bimbingan secara orang perseorangan dan pendekatan secara *Lesson Study*. Justeru itu kajian ini dijalankan bertujuan untuk mengenalpasti sejauhmana pendekatan secara *Lesson Study* ini memberi impak kepada guru pelatih tersebut.

### 4 OBJEKTIF KAJIAN

Objektif kajian ini adalah untuk mengenalpasti:

- a) Sejauhmana pendekatan *Lesson Study* ini memberi impak kepada guru pelatih dalam proses pengajaran.
- b) Sejauhmana pemerhatian kelas terbuka yang dilaksanakan memberi nilai tambah kepada proses pengajaran guru.
- c) Isu-isu penambahbaikan dalam memperbaiki latihan mengajar bagi guru pelatih.

### 5 METODOLOGI KAJIAN

Seramai lima orang guru pelatih telah terpilih dari dua sekolah yang berbeza, empat orang guru pembimbing, lima orang rakan sebaya dan empat

orang pensyarah. Kesemuanya mereka telah bersetuju untuk turut terlibat dalam proses pemerhatian pada sesi kelas terbuka. Sebelum kelas terbuka dijalankan guru pelatih telah berbincang bersama pensyarah, rakan sebaya dan guru pembimbing untuk menulis rancangan pengajaran harian. Elemen yang terkandung dalam rancangan harian tersebut ialah tarikh, tajuk, set induksi, perkembangan, penutup dan refleksi sendiri (Lihat Lampiran) (Zanaton Iksan dan Md Yusoff Daud, 2014). Semasa kelas berjalan, semua yang terlibat telah membuat pemerhatian sepanjang proses pengajaran guru tersebut. Disamping itu juga, rakaman video turut dijalankan. Selepas sesi pengajaran guru pelatih diminta untuk memberikan refleksi sendiri berkaitan dengan proses pengajaran yang telah berjalan. Huraian perlaksanaan pendekatan *lesson study* adalah seperti berikut:

Langkah 1

Guru yang mengajar di minta membuat refleksi berkaitan dengan proses pengajaran pada hari itu dengan menyatakan apa-apa sahaja perasaan, kekuatan dan kelemahan.

Langkah 2

Setiap pemerhati yang turut serta semasa sesi pengajaran diminta untuk memberikan ulasan dan refleksi berkaitan dengan proses pengajaran pada hari itu. Teguran atau cadangan penambahkan boleh dikemukakan dengan cara yang berhemah tanpa menyinggung perasaan guru pelatih tersebut

Langkah 3

Refleksi turut sama diberikan oleh rakan sebaya, guru pembimbing dan pensyarah yang terlibat. Beberapa idea penting samada pujian atau penambahkan diutarakan sebagai input penting yang berguna. Selepas mendengar refleksi dari rakan pemerhati, guru pembimbing dan pensyarah, guru pelatih diminta sekali lagi untuk memberikan ulasan dan justifikasi kepada komentar yang di berikan. Ketua projek akan merumuskan dapatan refleksi tersebut. Aspek yang ditekankan ialah berkaitan dengan

- i. Penyediaan rancangan pengajaran
- ii. Set Induksi
- iii. Kawalan kelas
- iv. Penyoalan
- v. Penggunaan Alat Bantu Mengajar (ABM) atau Media pengajaran
- vi. Rumusan dan penutup.

Data kajian dikumpul melalui laporan bertulis semasa pemerhatian proses pengajaran yang dilakukan dan juga refleksi di analisis. Temubual secara bersemuka diajukan kepada guru pelatih untuk mendapatkan input yang berkaitan secara lebih jelas dan mendalam. Rakaman video turut dianalisis bagi melengkapkan maklumat yang berkaitan. Analisis dijalankan menggunakan kaedah analisis bertema

atau *'thematic analysis'* (Miles dan Huberman, 1994).

## 6 DAPATAN KAJIAN DAN PERBINCANGAN

### a) Impak Pendekatan Lesson Study kepada Guru Pelatih dalam Proses Pengajaran

Proses pengajaran yang dijalankan oleh guru pelatih diperhatikan oleh rakan sejawat, rakan pelatih dari university yang berbeza, guru pembimbing, guru mata pelajaran dan pensyarah pembimbing. Pelbagai dimensi yang dilihat yang kemudiannya di cerakinkan dalam sesi refleksi. Analisis data daripada laporan bertulis dan refleksi guru pelatih menunjukkan beberapa aspek kekuatan dan kelemahan yang dikenalpasti. Aspek yang ingin ketengahkan adalah berkaitan dengan kesediaan guru pelatih dalam mengaplikasi pendekatan *lesson study*, kekuatan dan kelemahan guru pelatih dalam proses pengajaran. Data analisis menunjukkan persetujuan yang positif dari guru pelatih, menyatakan bahawa pendekatan *lesson study* ini memberi impak yang positif kepada proses pengajaran. Pada peringkat awal pendedahan ini sememangnya berlaku kelemahan sedikit sebanyak. Pendekatan *lesson study* ini memberikan satu lonjakan dalam diri untuk turut berubah. Guru pelatih pada mulanya merasa tertekan kerana pendekatan *lesson study* adalah satu pendekatan yang baru diperkenalkan. Ianya diikuti dengan proses pemerhatian yang dilakukan secara beramai-ramai semasa kelas terbuka. Ianya berbeza sekali dengan amalan pemerhatian sebelum ini yang hanya dijalankan oleh seorang pensyarah penyelia sahaja.

Kesemua guru bersetuju, pada awalnya mereka merasa gugup, lama kelamaan perasaan gugup itu hilang. Namun demikian satu perasaan puas hati, bangga dan teruja timbul apabila dijalankan sesi refleksi secara bersemuka beramai-ramai. Input dari sesi refleksi ini memberikan keyakinan baru untuk guru pelatih memperbaiki proses pengajaran selanjutnya. Sebagai contoh:

.....*"saya merasa sikit gugup....dan agak gementar pada permulaan pengajaran...tetapi setelah memulakan pengajaran perasaan itu semakin hilang.dan boleh teruskan pengajaran seperti yang dirancang"* (Liza)

.....*"Setelah diberitahu bahawa praktikum kali ini akan dilaksanakan melalui pendekatan lesson study...sedikit gementar, kerana selama ini saya belum pernah mendengar istilah lesson study....akan tetapi setelah selesai melalui proses ini, saya merasa sedikit teruja....."* (Yati)

### b) Impak kepada Proses Pengajaran

Impak kepada proses pengajaran berasaskan kepada pendekatan *lesson study* ini akan

dibincangkan berdasarkan aspek-aspek berikut, (i) persediaan rancangan pengajaran, (ii) set induksi (iii) kawalan kelas (iv) penyoalan, (v) alat bantu mengajar (ABM) dan (vi) sesi rumusan dan penutup.

i. Persediaan rancangan pengajaran

Gelungan kedua pendekatan proses pengajaran berasaskan *lesson study*, ialah merancang persediaan rancangan pengajaran. Semua guru pelatih yang terlibat bersetuju bahawa, pendekatan *lesson study* ini memberikan satu lonjakan kelainan dari amalan-amalan sebelumnya. Dimana rancangan pengajaran yang disediakan disemak dan dibincang bersama dengan rakan sejawat, guru pembimbing dan pensyarah penyelia. Kelpelbagaian pandangan dan cadangan sebenarnya telah bermula diperingkat awal persediaan rancangan pengajaran lagi.

*...”seronok dan teruja sekali..bila rakan-rakan dan guru pembimbing memberikan komen dan cadangan membina dalam penulisan rancangan pengajaran...(Guru Pelatih Ayu)”...*

ii. Set induksi

Set induksi dalam proses pengajaran merupakan satu elemen penting, dimana perkaitan dan hubungan diantara konsep yang hendak diajar pada hari itu boleh dikaitkan dengan suatu set yang dekat dengan pengalaman harian pelajar. Menurut Perrot (1982) set induksi ialah memberikan makna kepada sesuatu konsep yang hendak diajar dengan memberikan contoh-contoh tertentu. Sebaik-baiknya contoh yang diberikan itu berasaskan kepada pengalaman yang dekat dengan kehidupan seharian pelajar. Analisis refleksi berkaitan dengan aspek set induksi adalah seperti berikut. Sebagai contoh:

Menurut komen yang diberikan oleh Dr R berkaitan dengan elemen set induksi proses pengajaran oleh Guru Mala.

*...”inisiatif awak untuk memasukkan elemen set induksi dalam sesi permulaan pengajaran patut dipuji...tetapi..saya ingin mencadangkan agar set induksi yang dipilih biarlah sesuatu yang boleh memberikan perkaitan yang kuat dengan konsep yang hendak di ajar....(Komen Dr R)”...*

Dalam rumusan refleksi, guru pelatih bersetuju dengan cadangan pemerhati dan berjanji untuk mencarikan bahan yang berkaitan.

*...”pada permulaan pengajaran....agak susah bagi saya untuk mencari satu situasi atau bahan yang boleh menyokong set induksi dalam proses pengajaran....contoh set induksi yang saya gunakan agak tidak bersesuaian...namum cadangan set induksi yang diberikn sungguh teruja....dan saya berjanji untuk digunakan dalam sesi pengajaran akan datang”.....(Guru Pelatih Mala)*

iii. Kawalan kelas

Aspek kawalan kelas tidak kurang pentingnya dalam keseluruhan proses pengajaran. Melalui pendekatan *lesson study*, perancangan berkaitan kawalan kelas, telahpun dibincangkan dalam

persediaan rancangan pengajaran. Namun demikian apabila tiba pada waktu sesi pengajaran sebenar, realiti atau suasana pengajaran akan berubah. Faktor guru turut memainkan amat peranan penting dalam mengawal suasana kelas pada sesi tersebut. Menurut Buckler & Castle (2014) antara tip penting dalam kawalan kelas ialah faham tentang realiti semasa dan elemen kepelbagaian yang ada dalam kelas tersebut.

Kesemua guru pelatih mengakui bahawa aspek ini yang paling mencabar dari keseluruhan proses pengajarannya. Walaupun ianya telah dirancang awal, tetapi kebimbangan tetap wujud disudut hati sanubari, kerana pelbagai kemungkinan mungkin timbul semasa proses pengajaran yang sedang berjalan. Analisis refleksi berkaitan dengan kawalan kelas, antara lain mengatakan bahawa:

*...”elemen inilah yang paling sukar, kerana saya sedar dan faham dalam kelas saya ada pelajar yang sukar untuk di kawal..dan suka bermain-main dan bercakap-cakap di belakang...(Guru Pelatih Ayu)”...*

Sememangnya diakui bahawa, aspek kawalan kelas merupakan hati dan jantung dalam proses pengajaran dan pembelajaran. Jika aspek ini berjaya dikawal, keseluruhan proses pengajaran akan menjadi lebih mudah. Di antara refleksi ialah;

*....”sebenarnya elemen penegasan melalui intonasi suara, hukuman dan perhatian khusus..sedikit sebanyak boleh membantu...kawal kelas..(Dr Z)”..*

iv. Penyoalan

Penyoalan yang dibuat sepanjang prose pengajaran adalah penting bagi seseorang guru. Input dari jawapan pelajar boleh digunakan sebagai kayu ukur untuk menilai keberkesanan proses pengajaran pada hari itu. Guru boleh mengawal aras soalan yang dikemukakan, berasaskan kepada tahap pencapaian kelas masing-masing. Menurut Paul (1993) aras soalan dan teknik penyoalan yang baik boleh mendorong pelajar ke arah pemupukan berfikir secara kritis dan kreatif. Analisis refleksi menunjukkan guru pelatih berjaya menyesuaikan aras soalan dengan tahap pencapaian pelajarannya. Sebagai contoh:

*...”saya rasa amat lega..bila soalan yang saya kemukakan dapat dijawab oleh pelajar...saya risau juga takut apa kata pensyarah yang memerhati dibelakang”...(Guru Pelatih H)*

Namun demikian, komentar ringkas yang diberikan oleh pemerhati dibelakang dalam sesi refleksi. Antara lain:

*...”saya bersetuju dengan aras soalan yang diberikan. Namun teknik penyoalan boleh dipertingkatkan lagi. Berikan sedikit ruang masa untuk pelajar berfikir... sebelum jemput pelajar secara sukarela untuk menjawab soalan tersebut...berikan ruang juga kepada pelajar lain untuk tokoh tambah kepada jawapan tersebut..sebelum guru menjawab betul atau salah”...(Dr Z)*



v. Alat Bantu Mengajar (ABM)

Alat Bantu Mengajar, ABM tidak kurang pentingnya dalam menyokong keberkesanan proses pengajaran dan pembelajaran. Pemilihan ABM yang tepat akan memudahkan pelajar memahami sesuatu konsep yang di ajar. Menurut Heinich, Molenda dan Russell (1992), suatu garis panduan dan model yang khusus perlu dipelajari oleh guru sebelum menggunakan ABM dalam proses pengajaran dan pembelajaran. Model ASSURE adalah satu model yang baik dalam memilih ABM, kerana ia sangat bergantung kepada objektif pengajaran dan analisis keperluan pelajar. Analisis refleksi menunjukkan kesemua guru pelatih menggunakan ABM dalam sesi pengajaran masing-masing. Sebagai contoh:

*...”saya suka menggunakan ABM kerana saya yakin ia amat membantu saya mengajar dan membantu pelajar memahami apayang saya nak ajar...lebih-lebih lagi dalam dunia internet yang moden sekarang ini mudah bagi saya untuk mendapatkan imej yang menarik..Namun begitu banyak masa yang saya tumpukan untuk menyediakan ABM tersebut”....(Guru H)*

Komentar dari pemerhatian juga bersetuju, bahawa semua guru pelatih menggunakan ABM dalam sesi pengajaran. Sebagai contoh:

*.....”saya meyokong penuh dan memberikan kredit diatas usaha untuk menggunakan ABM dalam sesi pengajaran. Namun perlu diingat dan perlu diberi perhatian bahawa, jangan sekali-sekali ABM yang digunakan akan mengusutkan kefahaman pelajar tentang sesuatu konsep yang hendak di ajar...mudahnya seperti persembahan isi kandungan melalui penggunaan power point. Isi kandungan bahan perlu diringkaskan dalam pentuk poin-poin, kemudian awak sendiri akan huraikan dan elaborate dalam kelas”...Dr F*

vi. Rumusan dan penutup

Sesi rumusan dan penutup adalah sesi terakhir dalam proses pengajaran. Perancangan yang baik, membolehkan guru pelatih merumuskan keseluruhan pengajaran dalam minit-minit terakhir pengajaran. Pendekatan *lesson study* ini memberikan satu justifikasi yang baik, kerana perancangan pengajaran telah di selia bermula dari peringkat persediaan rancangan pengajaran lagi. Analisis refleksi menunjukkan kesemua bersetuju dan berpuashati dengan perjalanan proses pengajaran.

a) Isu-isu penambahbaikan pendekatan *lesson study* dalam latihan mengajar

Pendekatan *lesson study* dalam proses pengajaran dalam sistem persekolahan di Malaysia adalah sesuatu yang baru diperkenalkan. Rentetan isu-isu yang melingkari pendekatan *lesson study* perlu ditangani dengan berhemah supaya hasrat untuk menjadikan *lesson study* sebagai salah satu pendekatan yang digemari ramai menjadi realiti.

Antara isu-isu yang dirungkai bersama semasa sesi refleksi ialah:

- i. Peruntukan satu masa atau waktu khas disekolah, supaya guru boleh bersama berbincang dalam menyediakan rancangan pengajaran. Susunan jadual waktu perlu diselaraskan agar satu ruang untuk guru-guru, pentadbir dan ketua-ketua panitia boleh hadir bersama memerhati proses pengajaran yang dijalankan.
- ii. Paradigma berfikir juga perlu di ubah, dimana pendekatan *lesson study* bukan satu pendekatan untuk mencari salah guru yang mengajar. Tetapi pendekatan *lesson study* ialah untuk melihat proses dan perjalanan pengajaran. Naatijah akhirnya ialah keberkesanan pengajaran untuk manfaat bersama.

Guru perlu didedahkan dengan pendekatan *lesson study* melalui bengkel, seminar dan kursus. Bagi sekolah yang mempunyai peruntukkan yang besar, boleh melakukan lawatan sambil belajar ke negara-negara yang telah lama mempraktikkan pendekatan *lesson study* seperti Negara Jepun.

## 7 KESIMPULAN

Kajian ini memberi fokus kepada pendekatan *lesson study* dalam pelaksanaan Latihan Mengajar bagi Guru-guru pelatih di sekolah-sekolah terpilih. Kajian ini bersifat penerokaan awal dalam menjustifikasi pendekatan pelaksanaannya. Sebelum guru pelatih di hantar untuk menjalani latihan mengajar selama 14 minggu, guru pelatih tersebut telah didedahkan pendekatan *lesson study* melalui subjek Kurikulum dan Pedagogi serta subjek Pengajaran Mikro. Impak yang positif ditunjukkan oleh guru pelatih, guru pembimbing dan para pensyarah dalam mengaplikasi pendekatan *lesson study* ini. Isu keselarasan antara pihak berwajib perlu ditangani dalam usaha untuk mencari titik pertemuan dalam penentuan jadual waktu, masa dan kesediaan dalam merealisasikan pelaksanaan pendekatan *lesson study* dalam kerangka yang lebih besar dan menyeluruh. Kesediaan guru untuk dicerap dan bersedia untuk berkongsi pengalaman dalam sesi refleksi adalah satu petunjuk yang baik dalam membina kemahiran insaniah guru-guru pelatih tersebut. Adalah menjadi satu harapan dan impian agar suatu hari nanti pendekatan *lesson study* dalam proses pengajaran di Malaysia akan menjadi realiti, setanding dengan negara-negara maju lain yang telah mendahului kita. Saya yakin penuh impian ini akan menjadi realiti.

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## The Improvement of Clinical Capability Learning for Midwifery Students

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**Abstract:** Midwifery students receive the material lesson theoretically, practically and clinically. Yogyakarta Midwifery Academy is a vocational education. Vocational education educates more in capability as a tool to achieve nine midwife competencies. Yogyakarta Midwifery Academy innovate the learning process by watching video of clinical skills and using learning practice method in small groups with independent practice. The learning practice is the most important thing to achieve graduates competence. Students' independence and responsibility are important to be improved in the form of independent practicum in small group. The research aimed to determine that audio visual and the small groups could improve clinical capability of midwifery students. Students were separated into small groups. Students were given clinical capability practice material in small group independently. The samples of the research was 94 students. After get inform consent, students assess by using likert scale and will evaluate the practicum study result by OSCE method. The data was collected during one semester. The quantitative data analyzed by statistic software. From the evaluation result, the problem that was found will continue to process by using qualitative method.

**Keywords:** Midwifery students, study partner, small group

### 1 INTRODUCTION

Midwifery is one of health professionals who become a central pillar to decrease maternal death rank in Indonesia. Midwifery professional education, which is developing now, draws people's attention. Data from Directorate General of Higher Education said that in 2014 there is 697 major registered.<sup>1</sup> The number of the major should proportionately with the students therefore the right method is needed so that students can improve the skill to gain the midwife competencies.

Midwifery students receive the material lesson theoretically, practically and clinically. Midwifery Academy is a vocational education. Vocational education educates more in capability as a tool to achieve nine midwife competencies. Learning practice process gives a chance to students to feel directly so that they can go through the process, after that they can make the conclusion from a situation or a particular process.<sup>2</sup>

Method and media have an important role in the learning process. Lecturer should be able to choose the right one of the method and media. Method and media is a one unit that cannot be separated because it has function as an introduction material learning.<sup>10</sup>

Yogyakarta Midwifery Academy giving an innovation in the learning process by splitting students into small groups in practice method and let them to learn from each other. Learning in a small group can make each student more active.<sup>3</sup> Learning

practice in a small group can encourage the cooperation within the member.<sup>4</sup> Midwifery students doing the learning practice in a laboratory with lecturer guidance. To gain the maximum competence, learning practice is become the important thing. Being independent and having a responsibility are the important things to improve in learning practice through a small group independently.

A result from the previous research shows that in learning practice lecturer will doing a pre-conference in 20 minutes. Pre-conference is an explanation about the learning practice process including the tool preparation and the procedure requirements. After that a clinical capability learning practice demonstration will be doing by lecturer in 20 minutes then students will be given a chance to do the same thing in front of the lecturer. The interview result from 3 students shows that the time which is given is not enough so that they think they need more time to practice independently in front of the lecturer. Another interview result from 3 students shows that the explanation that they get from the lecturer is not always same from one lecturer to another lecturer so that it make them confused.

Based on that introduction, the aim of this research is to know that using clinical capability audio visual and making small groups are more effective to increase midwifery students' clinical capability.

## 2 THEORITICAL FRAMEWORK

### 2.1 Affectivity

Affectivity derives from the original word of affective which means successful. Affectivity is a measurement that gives a vision about how far our target is can be reach.<sup>5</sup> In this research, affectivity means that a success in using small groups method and partner study which is supported by using visual audio as a media.

### 2.2 Audiovisual

Using audiovisual as a media is a learning method that provides sound and visual that attracts students about how to put in IUD contraception tool. By using that media, we hope that students will become interested.

Students are more interested in learning by using audio visual method. Using VCD as a media has good influences in increasing study of normal birth capability learning.<sup>8</sup>

### 2.3 Small Group

Small group method is the right learning model in clinical capability practicum for midwifery students. This model can improve students' participation so that students can be more competence.

Small group is known as cooperative learning or collaborative or partner study that involves high level of interaction.<sup>9</sup>

### 2.4 Partner Study

Partner study means that a friend in the same group which has more capability. A help that comes from partner study can eliminate fear. Diction that is used by partner study is easier to understand so that students can explain the difficulties without feeling ashamed.<sup>6</sup>

The application of various model of learning along with a consistence evaluation system is an effective way to used in the learning process that can be seen in the increase of students learning outcomes. Using the same age tutor can help students in solving the problem such as in doing exercise questions.<sup>7</sup>

## 3 METHOD

This research is using experimental research method by using *randomized pre-test and post-test* with *control group* model. The location of this research is in Yogyakarta Midwifery Academy.

There are two groups in this research that is compared; control group and experimental group. The population of this research is all of the three grade students of Yogyakarta Midwifery Academy in year of 2014/2015 as many as 243 students. The technique that is used to take the sample is *simple random sampling* technique. The number of the sample in this research is 94 people. The instruments research is a questioner satisfaction method and media learning with likert scale.

The question is analyzed by using validity and reliability test. After that hardship index, distinguishing features, normality test and homogeneity tests are seen then analyze by using T-test is also been done.

### 3.1 Learning Process in Experimental Group

The process of research is done by dividing students into small groups. Each of group is consisting of 7-8. Lecturer use IUD insertion VCD as a media in teaching class. Learning practice begin by watching video about how to put in the contraception tool in womb. Students do practice independently in small groups twice for each clinical skill. Each of the small groups is lead by one person in charge to coordinate all of the members. All students who become a respondent fill the informed consent. Student asses the learning method by using likert scale and the outcome of learning practice will be evaluated by using OSCE method.

### 3.2 Learning Process in Control Group

In the beginning process, lecturer will give asperses to knowing about students knowledge about material study which will be given, that is about how to put in contraception installation tool in womb. Lecturer will doing pre-conference and demo about how to put in IUD.

After that, lecturer will give a chance to student to demonstrate about how to put in the IUD. Then lecturer and other students will evaluate the practice that has been doing by the student.

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# The Implementation Of Lesson Study On Chemistry Teachers Of Higher School In Palembang And Lubuk Linggau

## *The Implementation Of Lesson Study On Chemistry Teachers Of Higher School In Palembang And Lubuk Linggau*

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**Abstract:** Lesson Study was applied in Palembang since 2009. After dissemination in 2009, Lesson Study applied for Physical Chemistry II courses of major of Chemistry Education, Department of PMIPA FKIP Sriwijaya University. In 2010 contribute in the activities of Lesson Study in major of Chemistry Education. In 2012 Lesson study applied for Chemistry teachers at Musi Rawas regency and Lubuk Linggau City. In 2013 has been implementing Lesson Study with Chemistry teacher at the Schools of Muhammadiyah from Palembang Ilir zone. In 2014, we implement Lesson Study with Chemistry teacher of Muhammadiyah at Palembang city. This paper outlines the activities of lesson study that has been done and their results from each activity. Lesson Study activities were conducted in the Discussion Group forum (FGD). FGD is a activity cycle, each cycle consisting of three phases: Plan, Do, See. FGD conducted in the Plan, and the stage See. Each cycle produced agreements on the success and improvement of chemistry learning. See stage of FGD is a matter of FGD initial Plan phase of the next cycle. Success criteria, are to be identified various factors that have been reinforced, and the increasing satisfaction levels of student in learning chemistry.

**Keywords:** Lesson study, Chemistry, Higher school, Palembang

## 1 INTRODUCTION

Lesson Study in South Sumatra began to develop since 2009, indicated by Lesson Study dissemination in FKIP Sriwijaya University, conducted by Sumar Hendayana, Ph.D. in february 2009. Lesson Study activity in 2009 has been performed throughout the course of study within the Faculty of Teacher Education Department of Mathematics University of Sriwijaya. Furthermore FKIP Sriwijaya University disseminates Lesson Study to entire district in the province of South Sumatra. A Team disseminate Lesson Study in Musi Rawas and Lubuk Linggau City. Subsequently, in 2013 and 2014, disseminate Lesson study among chemistry teachers in Muhammadiyah High school in Palembang.

Preliminary Lesson Study developed in Japan state. In 1998 Lesson study spread to America and other Countries, including the spread in Indonesia. Lesson Study according Hendayana et al (Hendayana, 2006), is a model of coaching teachers / lecturers through joint activities assessing continuous learning process within a learning community. In Lesson study all active community members in the

assessment effort, resulting in a thorough lesson plans and can be realized in the classroom.

A Lesson Study is a form of collaborative activity in boost all things related to the teaching and learning process. Everything related to the teaching and learning process, among others (Sanjaya, 2011): knowledge about teaching materials, knowledge of learning, the ability to observe the activity of learning, improving collegiality relationships, improving the relationship between implementation of daily lessons with a long-term goal to be achieved, increase motivation to learn, both teachers and students to always evolve, and improve the quality of the learning plan.

Lesson Study activities carried out in the forum of Group Discussion (FGD). Activity in FGD activity cyclical, each cycle consisting of three phases: Plan, Do, See. FGD conducted on Plan stage, and the stage See. FGD in Plan stage are planning the implementation of the activities performed Do stage, and FGD in See stage are discuss about the data collected from Do stage. Each cycle produced agreements on the success and improvement of learning in chemistry learning learn the material. The FGD of See stage produced key word of FGD initial Plan phase of the next cycle. In FGD the teachers

together, with the help of educational experts (Research Team) conduct continuous assessment of learning. Having agreed on the form of activities that will be performed at the time of Do, the final of FGD Plan stage is one of the teachers agreed to be the model teacher in the Do stage will portray all agreed procedures; while other teachers who act as observers to collect data to be material FGD See stage. Success criteria, are to be identified various factors that have been reinforced in every stage of the lesson study, and the increasing levels of student satisfaction in learning chemistry. Outcome of this activity is to get the experience to implement teacher lesson study.

## 2 IMPLEMENTATION OF LESSON STUDY

### 2.1 Implementation In FKIP UNSRI at 2009 and 2010

In 2009 implementing Lesson Study in major of Physical Chemistry II Program Studi of Chemical Education FKIP Sriwijaya University (Sanjaya, 2009). In 2010 to participate actively in the activities of Lesson Study in Chemical Education Program (Sanjaya, 2011). Socialization and workshops of lesson study for level faculty was conducted on 24 - 26 February 2009. And then, on 17-18 March, 2009 an workshop internal Lecturer Chemistry, prepare teaching plan and teaching material. The results of the workshop include: observation instrument, SAP, teaching materials, teaching materials and evaluation instruments. Implementation of Lesson Study in Chemistry education Prodi held in the second semester of the 2008/2009 Physical Chemistry II course.

Lesson Plan on the first attended by a group of lecture physical Chemistry. Sanjaya as model lecturer of Physical Chemistry II course. Plan of study are: Initial activities, consisting of apperception is done frequently asked questions about physical chemistry II material to be discussed. The material will be discussed in colligative properties do 1 is the real solution. The group of students who have been determined are welcome preparing to lead a class discussion group. Core activities, comprised of a group of students who received an explanation task of explaining the course material, classroom discussions to deepen understanding of each student. Lecturers will direct the course of the discussion, or provide a way out if the discussions had deadlocked. Final activity, consists of preparing a summary and tests / exercises.

Do 1 meeting held on Tuesday March 18, 2009. Material discussed is finding a potential relationship between chemical components dissolved in the solvent and the real solution. The first meeting began with an explanation of the student group. After an

explanation of matter, opened the opportunity to ask other students. During the learning process of the interaction both among students and between students and lecturers. Interaction between students is quite good, it looks like the interaction and question and answer discussion, express ideas or opinions, as well as respond to questions or concerns another student either in a group or with other groups. Likewise with faculty interaction with students is quite good. At the end of the lesson, the group presenters gave examples of problem-solving and tasks to improve understanding and determine the level of students' understanding of the lecture material. The results of the examination of the tasks it is known that the level of student understanding is quite good.

See 1 based on observations at the confluence Do 1, it can be reflected as follows. Still there are students who are not actively involved in both the group discussion and class discussion this is because learning is done discussing a fairly dense material, so there are still some students who are less active. The learning process is still dominated by a group of student explanations. Class situation still looks stiff this is because faculty and students are not familiar with the presence of the observer.

Plan II meeting reflection models based on the results of 1 See. Initial activities, consisting of apperception about the dependence of the molar conductivity to concentration. Core activities, beginning with the delivery of material by a particular group of students, class discussion with the leadership of the head of the student group. Attention to the course lecturer class discussion. Lecturers will mediate if there is a debate between the presenters and students. The discussion concludes with examples of application of the concept and practice the application of concepts. Final activity, consisting of the preparation of the conception of the concentration dependence of the molar conductivity.

Implementation of Do second was held on Tuesday, April 8, 2009. The material presented is the concentration dependence of the molar conductivity. Starting with the delivery of material in class discussions by a particular group of students, with student leaders of the group leader. The discussion concludes with examples of application of the concept and practice the application of concepts. Observation results illustrate that more students and a question and answer discussion, expressed his or her opinion, as well as respond to questions or concerns of other students either in groups or with other groups. Implementation See 2 concludes there are still students who do not engage in group discussions, and class discussion.

Plan of the third cycle is meeting to plan the initial activity is to do a question and answer on the cell potential measurement applications. Core

activities, starting with an explanation by a group of students about the cell potential measurement applications. The student group gives a case related to the application of cell potential measurement to the other groups, presentation of the results of each group. Finally, drawing conclusions and testing.

Implementation Do third held on Tuesday, April 22, 2009. The observations illustrate that the interaction between the students already classified as better than previous meetings, it is seen more and more students and a question and answer discussion, express his or her opinion, as well as respond to questions or concerns students others both within the group or with other groups.

See 3 reflects that student activity is optimal and students involved in group discussions, and class discussions, better activities on faculty and students.

## 2.2 Implementation in Lubuk Linggau

FKIP Sriwijaya University in 2012 to send a team for each district / city in the province of South Sumatra (Sanjaya, 2012). The author with the rest of the team given the task of implementing Lesson study in Musi Rawas Regency and Lubuk Linggau city. Lesson Study Team tasked to accompany the FGD of 9 subjects in the UN. Lesson study initiated by the dissemination of Lesson Study to all teachers who are invited, and then form a group discussion of each subject, as well as hold implement the Plan, FGD preparation of lesson plans in the form of discussion that will be implemented in stages Do.

Lesson Study in Musi Rawas Regency and Lubuk Linggau City was conducted in two sessions and two meetings. The first meeting was held on Thursday, November 1, 2012 at SMAN 1 Tugumulyo Musi Rawas. At this meeting attended by seven Chemistry teachers. Model Teacher in Do stage is teacher of SMAN 1 Tugumulyo. Models teacher with other teachers, and supervisor planning activities of Do in XI Science class; learning tools used are lesson plans, instructional media, instructional models, student worksheets and evaluation tools and instruments of observation learning process. In the process of assisting the teacher was happy because so far they have never had the guidance and direction by the principal or superintendent of subjects. If they have difficulty, they not have consult the confusion of these difficulties. The principal can not always



Figure 1. Dissemination of Lesson Study at Lubuk Linggau

preoccupied with the problem of other problems, even if there is a chance the principal can not provide a solution. Supervisor difficult to find, in addition to the low frequency of visits to school also knowledge of learning are inadequate.

The second meeting was held on November 8, 2012, at SMAN 1 Tugumulyo Musi Rawas. At the second meeting was held Do and See stage activities. Before Do stages, the model and teacher observers gathered in advance to get a briefing from supervisor. Supervisor directs how teachers observers should take a position in the class to be able to observe students and teachers during the learning process. Teacher observers are directed to observe the activity, expression, posture, gestures takes place. The observation of teachers observers will be used as the material and data in activities See later. Do carried out for a two hour ( 2 x 45 minutes). Model teachers implement instructional models in accordance with the RPP and the teachers observers take a position in the rear, left side and right side in the classroom. Activities do begin at 10:00 am until 11:30 pm. The next activity is carry out See stage. Model teacher reveals the strengths and weaknesses of the model during implemented learning process. After that the teachers one by one observer reveals what observations of the learning process that has just been implemented.

Teachers model and teacher observers feel happy with implementing lesson study, but they have doubts whether this activity can be resumed. The first inter-school locations far from each other. Second, because this activity is not available for the fund. Supervisor to provide input that their distance from each other which can be overcome by providing a day of the week to be able to come together and put together a program that can be entered on the school budget plan.

In Lubuk Linggau city, the first meeting was held on Friday, November 2, 2012 at SMK 1 Lubuk Linggau. At this meeting attended by six subject teachers chemistry. In this plan the activities agreed upon model teacher is a teacher of SMAN 5 Lubuk Linggau. Do stage be implemented in class XI Science. The second meeting, do and see, held on November 9, 2012, at SMAN 5 Lubuk Linggau.



Figure 2. Plan Stage of Lesson study at Lubuk Linggau





Figure 3. Do stage of lesson study at lubuk linggau

Lesson study activities, overcoming problems associated with learning. Teachers share about a variety of approaches, strategies, methods and models of good teaching in teaching. Each teacher teaches the use of media as well as ICT and increase creativity.

## 2.3 Implementation in Palembang

### 2.3.1 Implementation Palembang 2013

In 2013 has been implementing Lesson Study with Chemistry teacher in Environmental of Muhammadiyah schools across the region Ilir Palembang (Sanjaya, 2013). In this service activities FGD formed through an invitation to high school chemistry teachers across the region Muhammadiyah Ilir in Palembang, to form the Group MGMP Chemistry teachers who teach in Muhammadiyah Palembang. In the following table is the chemistry teachers who attended the event this Service:

Table 1. Name of Chemistry teachers High school of Muhammadiyah.

No	Name of chemistry teacher	Name of High school
1	Rosita, S.Pd.	M A M 1 Palembang
2	Dessy Zulmi, S.Pd.	SMA 'Aisyiyah 1
3	Fathimah, S.Pd.	SMA M1 Palembang
4	Pasilati, S.Pd.	SMA M1 Palembang
5	Dra. Gita Huresetia	SMA M1 Palembang
6	Drs. H. Kurdi Mukti	SMA M1 Palembang
7	Sugeng Iswanto, S.Pd.	SMA M2 Palembang
8	Fatmawati M, S.Pd.	SMA M3 Palembang
9	Istuti, S.Pd.	SMA M4 Palembang
10	Dra. Nini Heryanti	SMA M6 Palembang
11	Leni Febrianti, S.Pd.	SMK M1 Palembang

The team consists of five people, which consists of one chairman, two members who are experts in the learning process and Chemistry 2 students final project; together teachers determine priority issues agreed to be solved during the implementation of service programs.



Figure 4 Opening Event Lesson study

The result of the discussion stage Plan is as follows: Taking into account the implementation of the new curriculum, Curriculum 2013, then selected as the class class X Do. Chemistry subject matter to stage Lewis Coat Do is, for a time of 1 hour meeting. The topic was chosen because it is a material that has been planned to be taught on the day of Do, so that learning is not disturbed. Designed together preliminary activities, core activities, and closing activities. Of the various proposals, it was agreed to apperception activity, students are invited to engage in dialogue about the solar orbit. Then the sequence of questions that challenge and engage students about the solar system. It ends with a series of questions that teachers convey the material to be learned is that the outermost electrons orbit around the nucleus of an atom. Students are grouped into several groups with the group name is taken from the name of an existing group in the periodic system. Each student brings cardboard worn around the neck of each. Carton has been painted emblem of the elements in the same group with the group name. Elements in the chain each, will be used to exercise determine lewis emblem. In core activities, planned teacher invites students to know the number of electrons of an element, grouping the number of electrons by electron charging rules, invite students to determine the number of outer electrons of each element, and tell the students the rules of making emblem Lewis. Then together describe lewis emblem necklace elements in each. Plan covers activities agreed to invite students study summarizes the results, giving the task to present the material enrichment and associate with the meeting materials chemistry lesson observation sheet preparation. Planned position of students and teachers observers at Do stage. As a model teacher is teacher of chemistry SMA Muhammadiyah 1 Palembang, Pasilati, S.Pd. With a model teacher is a local teacher, it is not necessary anymore for teacher adaptation models.

Activities performed on stage Do is as follows: Before the hour lesson begins, the teacher will be a teacher observer, studying guidelines for observation, while teachers prepare learning tool models. After the turn of the clock tolled sign learning, teacher models, and the observer entered the classroom. Teacher models prepare students to study chemistry, while teachers observer occupies a predetermined position. During the teacher in the role of teacher models, observers continued to make observations of the nearby students who are experiencing learning process. Results of student activities known observation that students experience the learning process. Some students were very enthusiastic in learning. Students closely follow the learning process directed by the Master Model. The learning process has been designed turns on the stage Do has successfully enabled students to learn. Students are excited and delighted in studying chemistry.



Figure 5. Students are very involved in the learning process

See satge is the activities carried out after carrying out stage Do, day after school students. FGD see the stage led by senior teachers, attended by a model teacher, teacher observer, and a team of experts. FGD began to hear reports observations by each observer. Furthermore, listening to your comments/impressions of the model teacher. The next comment from a team of experts as well as analyzing the learning process that takes place on stage Do. FGD See stage, generate conclusions about what has worked and what learn constraints that hinder the process of learning in students.



Figure 6. See stage. are discussing the learning process that occurs in stages Do.

Lesson Study lasted for 2 months in 2 cycles, where each cycle produced agreements on the

improvement of learning chemistry, namely an increase in the role of teachers in lesson study partners, both quantity and quality, the relationship between teachers Chemistry in Palembang, Chemistry Teacher professionalism and increased confidence in the teachers can teach chemistry to chemical subjects with fun.

### 2.3.2 Implementation in Palembang 2014

In 2014 was implemented a Lesson Study for teachers of high school Chemistry teacher of Muhammadiyah in Palembang City (Hadeli, Sanjaya, Desi, 2014). Lesson Study starts from the formation of FGD (Focus Group Discussion), which is conducted through PDM notice to the Head of SMA Muhammadiyah Palembang. Teachers of chemistry of High school Muhammadiyah Palembang were divided into 2 groups: group A, Region Partner Kemuning and group B, Bukit Kecil Regional Partners. In the implementation of Lesson study, it turns out to be ineffective division. Teachers of Kemuning fewer than the group Bukit Kecil region. Kemuning group is a teachers group of school entered the afternoon; so as not to interfere with the activities of teaching, the teachers gathered in the morning. Bukit Kecil Group is a school teacher who entered the morning; so gathered at the school in the afternoon. The number of schools that entered the afternoon less than the incoming school in the morning, which is 4 : 11.

At this stage of the Plan, teachers together, with the research team, conducting learning assessments of chemical material that is considered difficult, and plan how learn students. Discussion of learning steps to incorporate things that specified in the implementation of the curriculum of 2013. At the end of the meeting, agreed Mrs. Nopi, S. Pd, a teacher models on stage Do.



Figure 7. Opening and Plan stage in Palembang 2014

In the Do stage, Mrs. Nopi, S.Pd. teaching activities, applying FGD Plan stage, and while the other teachers and the research team became an observer of student learning activities. Each group of students around the observer observing the observer, the observed data are used as an ingredient FGD See stage.

At the stage See, first Teacher models convey the experience of being as models. Then followed other teachers present the results of observations and to provide comments on the students' learning process. The research team with the teachers - teachers discuss the observations, to find what has been produced and what does not work, what are the factors that hinder success.



Figure 8. Do stage of lesson study in Palembang 2014

Lesson Study takes place in two cycles for 2 months. In the second cycle, started with a PLAN. During the meeting, discussed the subject matter of other chemicals that is felt hard. In the second cycle is planned to be taught is a matter of determining the location of the elements in the periodic system using electron configuration information.



Figure 9. Do stage of the second cycle of lesson study at Palembang 2014

After the completion of phase Please Do immediately followed, which held a discussion on the students' learning process during stage Do. It was agreed that there has been a good learning process in most students. The learning process occurs with the

application of scientific learning as a form of curriculum 2013. Students experience learning through observing teachers' instructions and tried stages of learning from worksheets, ask each other, reasoning in group discussions, and try to do the work and workout is in LKS.

In addition to seeing the success of the learning process, teachers are motivated to create articles based on the results of the results of the lesson study. At the end of the meeting, teachers agreed will drafting the articles, which will be assisted by a team of researchers improved the article, and the article will be sent to the Research Journal Of Chemistry Education PMIPA FKIP Sriwijaya University.



Figure 10. See stage and closing of lesson study at Palembang.

### 3 CONCLUSIONS

Lesson Study has been conducted of the following results, Lesson study in education study program Chemistry Department PMIPA increased relationship scientist group, and Increasing the quality of the lecture.

Lesson study in Lubuk Linggau Increased awareness of teachers to hold regular meetings of teachers, Increased relationship silaturahmi teachers throughout the field of study. And then the emergence of a commitment to mutually benefit from the facilities and infrastructure owned by each school.

Lesson study in Palembang Increase the quality of learning of chemistry teacher in SMA Muhammadiyah. Generates LKPD ( sheet activities of Students ), which refers to the curriculum in 2013, Increased social relationships teachers Chemistry in Palembang professionally. With this activity, especially the activity MGMPs Chemistry teacher becomes intense and sustained. And the top is scientific articles produced by each of the participating teachers of lesson study.

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## The Improvement of Students' Critical Thinking On Embryology and Animal Reproduction Course Through Lesson Study In Biology Education Department of Faculty of Teacher Training and Education University Of Muhammadiyah Malang

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**Abstract:** The skills and capabilities of students need to be improved so that they have the awareness to seek information, knowledge, and equip themselves with a high scientific capacity and the ability to think critically. The approach used was a lesson study. Lesson study is a coaching model for educators through a collaborative and sustainable learning assessment. This research aimed at describing the results of lesson study implementation to improve thinking ability of the sixth semester students at University of Muhammadiyah Malang on Animal Reproduction and Embryology course. The research subjects were 40 students of Biology Education Department class 2010 who attended Reproduction and Embryology course. The lesson study was conducted within four cycles. The learning model chosen was cooperative learning model with jigsaw method for cycle I. Meanwhile, the method for cycle II, III, and IV was two stay two stray. The indicators of critical thinking skills observed were clarity, the level of accuracy, precision, relevance, logical thinking used, the breadth of viewpoints, the depth of thought, honesty, the completeness of the information, and the implications of the proposed solution. The results of lesson study implementation to improve the students' critical thinking were as follows: the critical thinking skills cycle I showed 50% of clarity, 75% of level of accuracy, 50% of precision level, 60% of relevance, 50% of logical thinking used, 50% of the breadth of viewpoint, 50% of depth of thought, honesty of 87.5%, 62.5% of completeness of information, and 50% of implementation of the proposed solution. The thinking capability data from cycle I to cycle IV showed an increase, with the data shown as follows: 90% of clarity, 87.5% of accuracy rate, 80% of the precision rate, 87.5% of relevance, 80% of logical thinking used, 87.5% of the breadth of viewpoint, 80% of depth of thought, 87.5% of honesty, 87.5% of completeness of information, and 80% of the implementation of the proposed solutions.

**Keywords:** Critical Thinking, Lesson Study, Animal Reproduction and Embryology

### 1. INTRODUCTION

Students are part of the youth who contribute to the progress of the nation. Students, as human beings, must have the sensitivity and awareness towards the condition around them. These sensitive and caring attitudes need to be grown. Furthermore, the skills and capabilities of students should also be improved so that they have the awareness to seek information, knowledge, and equip themselves with a high scientific capacity and the ability to think critically (Fitri, 2011).

According to Paul and Elder (2005), critical thinking is a way for someone to improve the quality of ideas by using intellection systematic techniques and to generate intellectual thought. The criteria in critical thinking process are clarity, the level of accuracy, precision, relevance, logical thinking used, the breadth of viewpoints, the depth of thought, honesty, the completeness of the information, and the implications of the proposed solution. Therefore, a method is needed to teach a course in order to improve the students' critical thinking skills.

A learning process that can foster the students' critical thinking is the cooperative learning model

by using jigsaw method and *two stay two stray* method. In *two stay two stray* method, students learn to solve problems together with members of the group; then two students from the group exchange information to two members of another group who stay (Lie, 2002). Students are required to have responsibility and be active in each learning activity. The delivery of material is associated with daily life or results of a research so that the students may easily understand since it is familiar and foster the character values corresponding to their personality.

Students who attend Animal Reproduction and Embryology course in the Biology Education Department of University of Muhammadiyah Malang are supposed to be the sixth semester students who have taken various pre-requisite courses. However, several students who are still in the fourth semester and have not taken the prerequisite courses are found. The problem that arises was the teaching learning process which was only limited to memorizing, understanding and the application of the understanding, and less emphasis on higher cognitive aspects such as the sharpness of analysis and evaluation, and the development of creativity. During the lecturing, students were

passive; they come to the class without learning the material in advance. In addition, the students were said to have high achievement if they had a lot of memory and understanding of the knowledge given by the lecturers. In fact, the lecturers were supposed to only facilitate the students by giving a problem, and motivating them to solve it. Furthermore, the material given was less oriented to the application of the lecturers' field of study, research, and long-term needs. The lecturers have been patterned by the knowledge that they have been mastered and teaching is considered only as a field of work. Moreover, most of the competences/purposes of lecturing were limited only to low-level cognition, whereas the physical subject was limited merely to psychometric domains. The high-level cognition and affective domain were still neglected, although plans with other lecturers observing them, and reflecting, whether the students have achieved the desired competencies by following the plans or not. The approach used is a lesson study (LS). Lesson study is a coaching model for educators through a collaborative and sustainable learning assessment based on the collegiality and mutual learning principles to build a learning community. (Hendayana in Wahyu, et al, 2011)

Lesson Study is a learning society that consistently and systematically performs self-improvements on the individual as well as managerial level. In addition, it is a collaborative and continuous learning that involves planning, implementing, observing, and reporting learning outcomes (Supriatna, 2012).

The implementation of LS includes several stages, namely planning (plan), implementation (do), and reflection (see). This activity is carried out by a group of lecturers. LS can be taught to students (prospective teachers) because LS is conducted periodically and continuously in order to enhance the competence and professionalism of teachers.

In learning activity, LS not only functions as an attempt to enable students to be active, but also as a review of the lecturers' performance and the development of students' academic abilities as well as to foster caution and responsibility in learning. LS will be observed and reflected together by students, observers, or by faculty observers.

## 2. METHODS

This research was a descriptive research by implementing a lesson study. The research subjects were the sixth-semester B class students of Biology Education Department class 2010 who were attending Animal Reproduction and Embryology course. The total number of the research subjects was 30 people. Implementation of the lesson study was conducted within 4 cycles. The phase of LS

those aspects are important in the scientific community for students' life and the world of work. Problems perceived by the lecturers were solved by themselves or discussed among the lecturers who taught the same course, however; rarely did they involve other colleagues who might help provide input and suggestions for the improvement, e.g. other lecturers who had different field of study or come from other departments.

In addition, most lecturers did not really know each other. Accordingly, the improvement of learning process needs to be done by all lecturers. In groups, they discuss competencies (cognitive, affective and psychometric) that must be possessed by the students, the course material to be learned to achieve the competencies, how to plan the delivery of material to the students, practicing their consisted three stages, namely: (1) planning stages (plan), (2) the implementation stage (do), and (3) the stage of reflection (see).

The critical thinking skills observed were clarity, the level of accuracy, precision, relevance, logical thinking used, the breadth of viewpoints, the depth of thought, honesty, the completeness of the information, and the implications of the proposed solution.

## 3. FINDINGS AND DISCUSSION

### 3.1 Cycle I

#### a. Plan

LS team planned the lesson plan with direct learning model, formulated the Student Worksheet, prepared the instructional media, learning materials and assessment instruments, and learning activity observation sheet. The student grouping on cycle I was based on numbers. The material was given to the captain of class a few days before the implementation phase (Do). This was intended that other students can ask/copy the material from the captain. The method used was jigsaw method.

#### b. Do

Lecturer entered classroom with the observers. Each observer was equipped with observation sheet to be filled as a reflection after the implementation phase (Do). The stages of implementation in this cycle I included: (1) students formed groups according to animal anatomy observations that had been assigned (there were core and origin group corresponding animal names that would be observed). The core group consisted white mice, rabbits, pigs, goats, cows, and humans. The origin group consisted of the male/female fish,

male/female reptiles, male/ female aves, and male/female mammals. (2) This classification was based on the method used, the jigsaw method. (3) The students conducted observations in accordance with the predetermined task, (4) filling the provided observation sheet, and (5) discussing the proposed problems. (6) the lecturer appointed two groups to present the results of the discussion, (7) observing the critical thinking skills namely clarity, the level of accuracy, precision, relevance, logical thinking used, the breadth of viewpoints, the depth of thought, honesty, the completeness of the information, and the implications of the proposed solution, (8) strengthening the results of the discussion presented by the students, (9) concluding the results of students’ work, and (10) delivering a follow-up to the next meeting.

### c. Implementation (Open class) and Observation

Activities that demonstrate the students’ critical thinking skills in cycle I can be seen in Table 1.

Table 1. Critical Thinking Skills in Cycle I

No	Indicator of Critical Thinking Skill	No of Students	%
1	Clarity	20	50
2	Accuracy Level	30	75
3	Precision	20	50
4	Relevance	24	60
5	Logical thinking used	20	50
6	Breadth of viewpoints	32	50
7	Depth of thought	20	50
8	Honesty	35	87.5
9	Completeness of the information	25	62.5
10	Implications of the proposed solution	20	50

### d. Reflection

After the implementation of LS in cycle I, reflection was conducted after the learning process was completed. Reflection aimed at reviewing the implementation of learning that had been carried out. Reflection was done by lecturers and all observers. One of the observers was appointed as the moderator and the other one as a note taker. The results of this reflection were used for the improvement of learning at the next cycle. Here are the results of the cycle I reflection.

- (1) Some students did not have the materials that had been copied to the captain of the class; this

has resulted in the implementation of learning which was not optimal. Supposedly, all students were required to have material that had been given by the lecturer.

- (2) There was no identification used by the students so that the observers found it difficult to observe the student activities.
- (3) During the observation, the students looked confused and the junior students did not understand the activities or material to be observed. Consequently, the time available became inefficient.
- (4) Time taken for observation was inefficient.

The efforts to improve the learning process in the next cycle (cycle II) were as follows.

- (1) Grouping might be done based on the high to low ability of students which could be seen from the students’ participation in the cycle I.
- (2) The softcopy of material could be given to the captain of each group according to the distribution of materials that had been defined previously.
- (3) To make the time to be more efficient, the ways of working should be described beforehand by the lecturers before the activity began.
- (4) All students were required to bring a uniform identification.
- (5) For more efficient time, the media used for observation was adapted to fit the method.

## 3.2 Cycle II

### a. Plan

Based on the results of cycle I reflection, in order to anticipate the excess time and the lack of students’ understanding towards the material, the LS team planned to make the material in the form of handouts. The instructional media used were PowerPoint and pregnancy or fertility test. The taught material was the hormonal control systems. The method used was Two Stray-Tree Stray. In addition, the LS team also prepared an evaluation sheet at the end of the lesson.

### b. Implementation (do)

The stages of implementation in this cycle II included: (1) studying the material to be learned independently, (2) forming a group with varied members, from the class of 2010 and 2011, (3) setting up equipment/materials assigned as a group, that are the urine of pregnant women and fertile women as well as pregnancy and fertility test pack, (4) finding literatures other than the given

literatures, (5) observing hormone in the urine, (6) discussing with the group, (7) writing the results of group discussion on a large sheets of paper, (8) displaying the results of the discussion in the provided space, (9) responding and asking questions during a visit to other groups, (10) discussing the observation results during the visit, (11) appointing the group with the most and the least favorable comments, (12) observing the critical thinking skills, (12) strengthening the discussion results submitted by the students, (13) giving an award to the group receiving the highest good points, (14) administering a quiz, and (15) giving a task for further material.

### c. Implementation (Open class) and Observation

Activities that demonstrate the students’ critical thinking skills in cycle II can be seen in Table 2.

Table 2. Critical Thinking Skills in Cycle II

No	Indicator of Critical Thinking Skill	No of Students	%
1	Clarity	32	55
2	Accuracy Level	30	52
3	Precision	20	35
4	Relevance	37	63
5	Logical thinking used	20	35
6	Breadth of view points	32	55
7	Depth of thought	20	35
8	Honesty	35	60
9	Completeness of the information	20	35
10	Implications of the proposed solution	25	42

Lie (2002) stated that cooperative learning with two stay two stray method is a method with stages of preparation and assessment systems, instructional design, students’ assignment preparation, the division of student groups in which each group consists 3, 4, and 5 students and each member of the group should be heterogeneous in terms of student’s academic achievement and gender, lecturers’ explanation, group work by students, and evaluation of learning.

The advantages of this method are as follows:

- (1) The students’ learning becomes more meaningful, more oriented to students’ active learning. Furthermore, it may also increase the students’ motivation and learning outcomes, provide an opportunity to the students to define their own concepts to solve a problem, give students the opportunity to create creativity in communicating with their group members, familiarize the students to be open to their friends, and increase students’ motivation to learn. (Anonymous, 2013)
- (2) The Lecturers use interactive lecturing method to give motivation to the students, deliver the

important concepts learned so that there is a clear link between the described materials and the observations conducted by the students.

- (3) Lecturer distributes observation tasks to each group as material to be discussed. Each group has similar discussion task.

### d. Reflection

The reflection results of the cycle II showed an increase in students’ learning activity in terms of critical thinking about the conducted observations. However, there were some members of the group who did not actively join the discussion especially the group whose members were mainly from the class of 2011. Accordingly, for the further planning, it was needed to pay special attention to students who were less active in the discussion and confused in doing the observations.

The students’ thinking skills, indicated on their activities during the learning process lasting for two cycles, was increasing. This was seen from the number of students who performed various activities with indicators of clarity, honesty, completeness of information, and the implications of the proposed solutions.

The efforts of improvement for the next cycle (cycle III) were: randomizing the group seating and the lecturers monitor the readiness of students to bring the materials for the next meeting. The seating was arranged in such a way to facilitate the lecturers in giving attention to all students so that there was no group domination.

## 3.3 Cycle III

### a. Plan

Based on the results of cycle II reflection, the LS team drafted a seating arrangement for students so that the lecturers and the observers would be easy to get around observing the group activities. In cycle III, the students’ seating was shifted, the group which at the previous meeting sat at the back would be in the front seat. In addition, the team also prepared critical thinking skill observation sheet.

### b. Do

The lecturer entered classroom with the observers. The observer stood beside or behind the class. The stages of implementation in this cycle III included: (1) Explaining the scenario to be implemented in the study, (2) Dividing the students into nine groups with four members in each group as agreement before the meeting. The group seating formed U shape, (3) Describing the animals used for the



ovum and sperm observation, that were mice, (4) Assigning each group to watch a video about the journey of sperm, ovum photos and motility mass of cow and mice sperm, motility, concentration, and mice sperm viability on their laptop with an honest, disciplined and thorough attitude. (5) Discussing the observation results (the journey and quality of sperm) that had been performed by using the Student Worksheet and working together to write it on large sheets of paper, (6) Assigning each group to work together to display their work/discussion in the provided space. (7) Appointing two members to stay in their group to explain their work to the guests, whereas the two others would visit another group to carefully observe the work of other groups, (8) Assigning the guests to return to their group and to match the work of other groups with their group, (9) Appointing the best and the worst group based on other groups' comment to inform the results of the discussion with other groups, and (10) strengthening the students' work/discussions.

### c. Implementation (Open class) and Observation

Activities that demonstrate the students' critical thinking skills in the cycle III can be seen in Table 3.

Table 3. Critical Thinking Skills in Cycle III

No	Indicator of Critical Thinking Skill	No of Students	%
1	Clarity	25	62.5
2	Accuracy Level	35	87.5
3	Precision	25	62.5
4	Relevance	30	75
5	Logical thinking used	25	67.5
6	Breadth of viewpoints	35	87.5
7	Depth of thought	27	67.5
8	Honesty	35	87.5
9	Completeness of the information	30	75
10	Implications of the proposed solution	25	62.5

Based on Table 3, there was a significant increase of students' critical thinking compared to the cycle II. This was because the students were already familiar with the open class, a class which was viewed by other lecturers as the observers; therefore, the students were more confident to inquire material that had not been understood.

### d. Reflection

The results of cycle III reflection were as follows:

- (1) Lecturers seemed to merely dominate some groups.
- (2) Lecturers could not monitor all groups.
- (3) References owned by students were lacking because some students only had the materials provided by the lecturers, they did not search references from other sources.

The efforts to optimize the next cycle (cycle IV) were:

- (1) Moving the room to conduct the LS implementation to a laboratory room with consideration that desks which supported the group work were available in the laboratory, and thus the lecturers and observers might freely observe the student activities.
- (2) Requiring the students to bring additional references as the source of learning, not just references provided by the lecturers.

## 3.4 Cycle IV

### a. Plan

Based on the results of cycle III reflection, to improve the implementation of cycle IV, the LS team prepared a learning observation sheet. The room to do the implementation of LS was at the laboratory.

### b. Implementation (Do)

The lecturer entered classroom with the observers. The observers stood beside or behind the class. The stages of implementation in this cycle IV included: (1) Explaining the scenario to be implemented in the study, (2) Dividing the students into six groups with four members in each group as agreement before the meeting. The names of the groups were 1). Spermatozoa, 2) ovum, 3) vas deferent, 4) oviduct, 5) uterus, and 6) epididymis. The group seating formed U shape, each group sat according to the plans and group members sat in a circle. (3) Delivering the information about animals used for external fertilization mechanism observation such as picture of sea urchin, fish fertilization videos, internal fertilization video (humans), and mice in vitro fertilization. The pictures and videos had been assigned at the previous meeting, (4) Assigning each group to observe the mechanism of sea urchin fertilization (picture), fish video, video of mice in vitro fertilization and humans' internal fertilization on their laptop with an honest, disciplined and meticulous attitude, as well as discussing the

observation results (external and internal fertilization mechanism) which had been performed by using the Student Worksheet fertilization and working together to write it on large sheets of paper, (5) Assigning each group to work together to display their work/discussion on the provided space, (6) Appointing two members to stay in their group to explain their work to the guests, whereas the other two would visit another group to carefully observe the work of other groups. The guests must visit the six groups alternately. This alteration was marked by a whistle sound. In addition, the guests would give pink sticker if they agreed with the group's work or green sticker if they gave suggestions/comments to the group. (7) Assigning the guests to return to their group and to match the work of other groups with their group, (8) Appointing the best and the worst group based on other groups' comment to inform the results of the discussion with other groups. The best group is the group with the most pink stickers, while the worst group is the group with the most green stickers/the lowest pink stickers. (9) Giving an award to the group who received the most pink stickers and the most green stickers accompanied by the song "Champion" before the group presentation, and (10) strengthening the students' work/discussion about the mechanism of fertilization.

### c. Implementation (Open Class) and Observation

Activities that demonstrate the students' critical thinking skills in the cycle IV can be seen in Table 4.

Table 4. Critical Thinking Skills in Cycle IV

No	Indicator of Critical Thinking Skill	No of Students	%
1	Clarity	36	90
2	Accuracy Level	35	87.5
3	Precision	30	80
4	Relevance	35	87.5
5	Logical thinking used	30	80
6	Breadth of viewpoints	35	87.5
7	Depth of thought	30	80
8	Honesty	35	87.5
9	Completeness of the information	35	87.5
10	Implications of the proposed solution	30	80

Based on Table 4, all indicators of critical thinking skills had increased, especially for the first indicator, that was clarity which increased by 27.5% from the implementation of cycle III.

### d. Reflection

The implementation of cycle IV was running as expected. All indicators of critical thinking skills had been achieved according to the initial target of LS implementation. The percentage of critical thinking skill improvement of cycle I, II, III, and IV can be seen in Table 5.

Table 5. The Improvement of Students' Critical Thinking Skill on Embryology and Animal Reproduction Course of the Fourth Semester of Biology Education Department Class 2010

No	Indicator of Critical Thinking Skill	% Cycle I	% Cycle II	% Cycle III	% Cycle IV
1	Clarity	50	55	62.5	90
2	Accuracy Level	75	75	87.5	87.5
3	Precision	50	50	62.5	80
4	Relevance	60	67.5	75	87.5
5	Logical thinking used	50	50	67.5	80
6	Breadth of viewpoints	50	50	87.5	87.5
7	Depth of thought	50	50	67.5	80
8	Honesty	87.5	87.5	87.5	87.5
9	Completeness of the information	62.5	75	75	87.5
10	Implications of the proposed solution	50	62.5	62.5	80

## 4. CONCLUSION

The critical thinking skills of Biology Education Department Students can be improved through the implementation of learning with LS on Animal Reproduction and Embryology course which is taught in the sixth semester. The improvement is seen from the observations of various students' activities during the course which includes: clarity, the level of accuracy, precision, relevance, logical thinking used, the breadth of viewpoints, the depth of thought, honesty, the completeness of the information, and the implications of the proposed solution.

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## Empowering Metacognitive Knowledge through Biology Learning Based on Lesson Study

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**Abstract:** This study aims to empower the students' metacognitive knowledge in biology learning especially evaluation for biological learning achievement through lesson study. Metacognitive knowledge is one of the higher-order thinking (HOT) skills that are important to develop based on the evaluation for biological learning achievement demands. In the evaluation for biological learning achievement, the students are able to understand evaluations' and assessments' concept, apply it concepts to design the assessments' instrument, and develop the higher-order thinking skills such that the students' metacognitive knowledge will be formed automatically. However, there are 12 students from 17 students who take the evaluation for biological learning achievement have difficulty and not realize how to resolve it difficulty when asked to develop the questions. The students was focused on example problems that was the given. To solve that students' problem, then in the evaluation learning using the stages' lesson study. In this research, the stages' lesson study will be apply for two cycles in the evaluation for biological learning achievement class consisting 17 students, one lecture and three observer. In the first cycle, the research was focused on how the students make example problems and rubrics based on cognitive domain, psychomotor domain and affective domain. In the second cycle, the research was focused on the cognitive process and cognitive knowledge dimension consisting of factual, conceptual, procedural, and metacognitive. First observation was focused on the declarative knowledge, and the second observation was focused on the activities that related to procedural and conditional knowledge. The result of this study showed that in the first cycle, there are 8 students have the declarative knowledge. However, in the second cycle, there are 12 students have the procedural and the conditional knowledge. Therefore, it can be concluded that there was a development in the students' knowledge especially metacognitive knowledge.

**Keywords:** metacognitive knowledge, lesson study, biology learning

### 1 INTRODUCTION

The general types of knowledge are factual, conceptual, procedural and metacognitive. Factual knowledge is knowledge of discrete, isolated content element bits of information. In contrast, conceptual knowledge is knowledge of more complex, organized knowledge form. Procedural knowledge is knowledge of how to do something. It includes knowledge of skills, techniques and methods, as well as knowledge of criteria used to determine and justify when some one to do what within specific domain and disciplines. Metacognitive knowledge is knowledge about cognition in general as well as awareness and knowledge about one's own cognition (Anderson and Krathwohl, 2001).

Metacognitive knowledge is one of the higher-order thinking skills that are important to develop based on the evaluation for biological learning achievement demands.

In the evaluation for biological learning achievement, the students are able to understand evaluations and assessments concept apply it concepts to design the assessments' instrument, and develop the higher-order thinking skills such that the

students metacognitive knowledge will be formed automatically.

However, there are 12 students from 17 students who take the evaluation for biological learning achievement have difficulty and not realize how to resolve it difficulty when asked to develop the questions.

The students was focused on example problems that was the given. To solve that students' problem, then in the evaluation learning using the stages' lesson study. This study aims to empower the students' metacognitive knowledge in biology learning especially evaluation for biological learning achievement through lesson study.

Lesson study provides a professional knowledge base for teaching. Lesson study is describes as a model for professional development rather than a research approach (Carlgren, 2012). The application of self-regulation to learning is a complicated process involving not only the awareness and application of learning strategies but also extensive reflection and self-awareness. Students who are skillful at academic self-regulation understand their strengths and weaknesses as learners as well as the demands of the specific tasks (Isaacson and Fujita, 2006).

## 2. METHOD

In this research, the stages’ lesson study will be apply for two cycles in the evaluation for biological learning achievement class consisting 17 students, one lecture and three observer.

In the first cycle, the research was focused on how the students make example problems and rubrics based on cognitive domain, psychomotor domain and affective domain. In the second cycle, the research was focused on the cognitive process dimension and cognitive knowledge dimension consisting of factual, conceptual, procedural, and metacognitive.

The observation was focused on the activities that reflect the metacognitive knowledge consisting of the declarative knowledge, the procedural knowledge and the conditional knowledge.

First observation was focused on the declarative knowledge, and the second observation was focused on the activities that related to procedural knowledge and conditional knowledge. Data analysis by descriptive analysis.

## 3. RESULT AND DISCUSS

### 3.1 RESULT

The metacognitive knowledge is knowledge of cognition in general as well as awareness and knowledge of one’s own cognition. The result of this study showed that in the first cycle, there are 8 students have the declarative knowledge. However, in the second cycle, there are 12 students have the procedural and the conditional knowledge.

The knowledge dimension, major types and subtypes and the examples (Anderson and Krathwohl, 2001) Table 1:

Table 1. The knowledge dimension, major types and the examples

Metacognitive knowledge	Examples
Strategic knowledge	Knowledge of outlining as a means of capturing the structure of a unit of subject matter in the text-book knowledge of the use of heuristic
Knowledge about cognitive tasks including appropriate contextual and conditional	Knowledge of the types of test particular teachers. Knowledge

knowledge	of the cognitive demand of different tasks.
Self-knowledge	Knowledge that critiquing essays is a personal strength whereas writing essays is a personal weakness, awareness of one’s own knowledge level

The examples of strategic knowledge

- Knowledge that rehearsal of information is one way to retain the information.
- Knowledge of various mnemonic strategies for memory.
- Knowledge of various elaboration strategies such as paraphrasing and summarizing biology aspect.
- Knowledge of various organizational strategies such as outlining and diagramming biology concept mapping.
- Knowledge of planning strategies such as setting goals for reading biology topic.
- Knowledge of comprehension-monitoring strategies such as self-questioning on discussing.
- Knowledge of means-ends analysis as heuristic for solving problem on biology topics.

The examples of knowledge about cognitive task including contextual and conditional knowledge:

- Knowledge that recall tasks (such as short-answer questioning in biology problems) generally make more demands on the individual’s memory system than recognition task (such as multiple-choice answer).
- Knowledge that a primary biology source book more difficult to understand than a general biology textbook or biology popular book.
- Knowledge that a simple biology memorization task such as the term of biology topics may require only rehearsal.
- Knowledge that elaboration strategies like summarizing and paraphrasing on biology topics can result in deeper levels of comprehension.
- Knowledge that general problem-solving heuristics on biology case most useful when the individual lacks relevant subject or task specific knowledge or in the absence of spesific procedural knowledge.

- Knowledge of the local and general social, conventional, and cultural norms of the local and general social, conventional, and cultural norms for how, when, and why for how, when, and why to use different strategies.

The examples of self-knowledge

- Knowledge that one is knowledgeable in some areas but not in others.
- Knowledge that one tend to rely on one type of cognitive tool (strategy) in certain situations.
- Knowledge of one’s capabilities to perform a particular task that are accurate not inflated such as overconfident.
- Knowledge of one’s goals for performing a task.
- Knowledge of one’s personal interest in a task.
- Knowledge of one’s judgments about the relative utility value of a task.

### 3.2 DISCUSS

The term metacognition has been used in many different ways, but an important general distinction concerns two aspects of metacognition: (1) knowledge about cognition and (2) control, monitoring, and regulation of cognitive processes. The latter is also called metacognitive control and regulation as well as more generally, self-regulation. Metacognitive knowledge to knowledge about cognition. The aspect of metacognition that involves metacognitive control and self-regulation reflects different types of cognitive processes and therefore fits into the cognitive process dimension (Anderson and Krathwohl, 2001).

Strategic knowledge is knowledge of the general strategies for learning, thinking, and problem solving. The strategies in this subtype can be used across many different tasks and subject matters, rather than being most useful for one particular type of task in one specific subject area. This subtype strategic knowledge includes knowledge of the variety of strategies that students might use to memorize material, extract meaning from biology text.

The large number of different learning strategies can be grouped into three general categories: rehearsal, elaboration, and organizational. Rehearsal strategies involve repeating words or term to be recalled over and over to oneself. They are generally not the most effective strategies for deeper levels of learning and comprehension. Elaboration strategies include the use of various mnemonics for

memory tasks as well as techniques such as summarizing, paraphrasing, and selecting the main idea from biology text. Elaboration strategies foster deeper processing of the material to be learned and result in better comprehension and learning than do rehearsal strategies. Organizational strategies include various form of outlining, drawing cognitive maps or concept mapping. Organizational strategies usually result in better comprehension and learning than do rehearsal strategies.

General learning strategies, students can have knowledge of various metacognitive strategies that are useful in planning, monitoring, and regulating their cognition. Students can eventually use these strategies to plan their cognition (set subgoals), monitor their cognition (ask themselves questions as they read a piece of text, check their answer to biology problems), and regulate their cognition (re-read some thing they don’t understand go back and repair their mistake in biology problems).

Knowledge about various strategies, individuals accumulate knowledge about cognitive tasks. Metacognitive knowledge, knowledge that different cognitive tasks can be more or less difficult may make differential demand on the cognitive system, and may require different cognitive strategies. A recall task is more difficult than recognition task. The recall tasks requires the person to search memory actively and retrieve the relevant information. The recognition task requires only that the person discriminate among alternatives and select the correct or most appropriate answer.

Self-knowledge was an important component of metacognition. In self-knowledge includes knowledge of one’s strengths and weaknesses in relation to cognition and learning. Self-knowledge is an important aspect of metacognitive knowledge but the accuracy of self-knowledge seems to be most crucial for learning.

Metacognitive knowledge includes knowledge of general strategies that may be used for different tasks, the conditions under which these strategies may be used, the extent to which the the strategies are effective and self-knowledge (Anderson and Krathwohl, 2001).

An important distinction is between knowledge of cognition and the monitoring, control, and regulation of cognition. Recognizing the distinction only students’ knowledge of various aspects of cognition, not the actual monitoring, control, and regulation of their cognition. In the way that the other type of knowledge are acted upon in some way by the cognitive processes the same is true of metacognitive knowledge (Anderson and Krathwohl, 2001).

The development of metacognition proficiency is the valuable purpose of education. It is because

this proficiency can help them to be self-regulated learner. Self-regulated learner has responsibility toward the ability of self learning (Suratno, 2011).

Lesson study has helped to construct shared knowledge about how to teach (Elliott, 2012). Lewis (2012), lesson study give it power to inform policy and transform practice, (1) attention to variation, (2) a mechanism for scale-up, (3) a window on instruction for policy makers, (4) creating demand for research.

#### 4.CONCLUSIONS

Metacognitive knowledge to knowledge about cognition. First cycle, there are 8 students have the declarative knowledge. However, in the second cycle, there are 12 students have the procedural and the conditional knowledge. Therefore, it can be concluded that there was a development in the students' knowledge especially metacognitive knowledge.

#### 5. ACKNOWLEDGEMENT

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## Increasing The Activity of Learning and Creativity of Teaching

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**Abstract :** Learning problems in private colleges is the lack of activity of college students in learning, while Lecturer still find it difficult to make improvements in teaching. This is because the input of students in private colleges are relatively less than compared with the input of students in universities. State. Departement of Education Mathematics at the University of Ahmad Dahlan was one of those who experienced the problem. Lesson study conducted at the Departement of Education Mathematics in University of Ahmad Dahlan was conducted by lecturers who are members of the same group or field, in this case the LS is done for courses "graph theory". Learning using approaches the Group and student activity sheets. As one of the benchmarks of success implementation of learning activities using a sheet of questions form activity. The results, the implementation of the Lesson study in Departement of Mathematics Education at University of Ahmad Dahlan was (1). An increase in the activity of college students in learning, (2). the growing creativity of lecturers in teaching, and (3). Cultural interactions between students, lecturers and students as well as the interaction and cooperation between the lecturers for improved quality of learning can be realized.

**Keywords :** activity of learning, creativity of teaching, lesson studies.

### 1. INTRODUCTION

This paper presented the results of a case study of the implementation of lesson study in higher education: which is carried out in Department of mathematics education at the University of Ahmad Dahlan in Yogyakarta. Lesson study in department of mathematics education at University Ahmad Dahlan was intended to improve the quality of learning as students prospective mathematics teacher through increased competence of pedagogic lecturer. From the series of activities of the lesson study is expected to be developed for effective learning models that can be used in the study.

### 2. MANUSCRIPT FORMAT

#### Lesson study in higher education

Students in the College are generally required to have a high independence in learning. This means that students have a high activity in their learning, initiative and independence is high. So did Lecture are required to have a breadth of understanding either the material or his pedagogic abilities, grows his creativity in the face of the student. At private colleges is very different, that expectations become barriers when its student input relative less well than with universities.

Lesson study is one of the coaching model is based on the principle of solidarity among

colleagues that aimed at creating a good learning community. LS is also one way to assist educators in making the plan a quality learning while gaining a better understanding. In Lesson study, teachers or lectures make the planning of learning collaboratively, observing the operations of the learning process and analyse the learning process going on in the classroom.(Lewis, et. Al., 2006). Therefore, it is expected that educators can produce a result that is good for the overall learning process.

The fundamental issues raised through LS are the low activity of college students in learning "graph theory". And how lecturer to efforts in enhancing student activities in learning. This means, how creativity is lecturer in teaching to improve its student activities.

One of the methods used in addressing the above issue by using problem-based learning. Problem-based learning is an approach to learning by making the confrontation to the students with practical problems, shaped ill-structured or open ended through stimulus in learning (Fogarty, 1977).

The underlying implementation of the LS is the first, the LS is a way that is effective for improving the quality of learning and teaching being done may improve student learning activities.. This is because (1) the development of LS is done and based on the results of professional knowledge sharing based on learning outcomes and practices conducted by the lecturer, (2). The emphasis is to make the students have a LS quality a high learning, (3). The purpose of the study was the focus point of main attention,

and (4). Based on the experiences in class, the LS was able to become the Foundation for development in the classroom, and (5). LS puts the role of teachers as researchers learning. Second, the LS is designed properly will result in a professional and innovative lecturer.. With LS lecturer may (1). Define learning objectives that match the requirements of students, (2). Reviewing and improving the learning that is beneficial to the students, (3). Deepen the knowledge about the learning material, (4). Specify long-term goals be accomplished students, (5). Collaboratively, learning plan (6). Do a reflection of learning that is conducted based on the development of students and colleagues.

### Methodology

Implementation of LS in department of mathematical education for courses "graph theory" involves the grouping of the lecturer. A lecturer as a lecturer models, the other as an observer. The implementation is done every Tuesday. LS is activities of 3 cycles, each cycle includes the activities of plan, do, and see. In the framework of the attainment of learning outcomes used observation tests given at the end of each cycle, as well as the observation sheet. Data were analyzed by descriptive analysis.

### Results and Discussion

The results of observation activities conducted observer noted in an observation sheet the result as follows:

Table 1 Activity of Students

No	Activity	Average Activity (percent)		
		Cycle 1	Cycle 2	Cycle 3
1	Enthusiastic students in learning	52.02	90.63	92.54
2	Student interaction with lecturers	48.51	81.25	88.12
3	Interactions between students	39.29	64.06	78.34
4	The cooperation group	45.09	75.03	80.56
5	Student activities within the Group	40.71	62.65	74.34
6	Student participation in the concluded result	25.05	31.25	56.05
	<b>Average</b>	41.78	67.47	78.33

From table 1 it appears that an increase in the percentage of students in the learning activity is fairly high in almost all aspects.

An increase in the activity of college students in learning is caused by the presence of learning activity that requires every student to be able to actively learn both individually and group. Similarly, the demands of the activity between groups. An observer in the classroom becomes one of the motivators for students to be able to perform learning activities optimally. The Observer has become a tool of control for their learning activities.

Creativity of lecturer also appears increasingly growing. This is due to the presence of other lecturers that the grouping that is able to evoke confidence models lecturer and other Lecturers. The activities of "plan" to be a means of intercultural lecturer prepared of learning plan becomes a shared responsibility. During the events of "do" Lecturer model showed a good effort in carrying out the learning in the classroom. Efforts to make innovation in the approach to students, the use of teaching methods, as well as media usage study. Other lecturers as observer objectively give attention and important notes the implementation study done, whether in accordance with a plan or not, as well as provide another note on the development of events over the learning process. The activity ends with "see" on the basis of observations that have been done giving positive feedback openly required to repair together. These activities became the basis for improvements to the "plan" for the next cycle so that the learning innovations appear to be done.

### 3. CONCLUSION

The results, the implementation of the Lesson study in Departement of Mathematics Education at University of Ahmad Dahlan was (1). An increase in the activity of college students in learning, (2). the growing creativity of lecturers in teaching, and (3). Cultural interactions between students, lecturers and students as well as the interaction and cooperation between the lecturers for improved quality of learning can be realized.

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## Implementation of Lesson Study In Enhancing of Student Learning Activeness On The Discreet Mathematics Subject In Mathematics Education Study Program of Ahmad Dahlan University

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**Abstract:** The learning that implemented by lecturers tend to use conventional method so that the result is student activeness be less. The aim of this article is to know the enhancing of student learning activeness on discreet mathematics subject through lesson study. In the observation of student learning activeness, technique of collecting data used observation technique and the instrument was observation sheet of students' activeness. The participants of lesson study were students of mathematics education study program at class D of semester 7 amount 56 students. This lesson study was implemented for 4 cycles with 4 meetings. The implementation of lesson study engaged all lecturers in mathematics education study program as model lecturer and the others as observers. Based on analysis of observation sheet of student learning activeness was obtained that lesson study with problem based-learning (PBL) implementation can enhance the student learning activeness. It can be seen from the percentage of activeness on 1<sup>st</sup> cycle was 57.35 %, 2<sup>nd</sup> cycle was 61.67%, 3<sup>rd</sup> cycle was 59.92 % and the last cycle was 67.75%. This shown that the criteria of student learning activeness on each cycle were in good criteria.

**Keywords:** Lesson study, Problem based learning, learning activeness

### 1 INTRODUCTION

Education is an aspect that contributes to build the human in the good quality. Improving the quality of education is absolutely the responsibility of all parties. The government through the Directorate General of Higher Education (DIKTI) always works to improve the quality of education in Indonesia. One of the efforts made by DIKTI is to provide Lesson Study (LS) grants on some LPTK under its ministry. One of LPTK's of LS grantee is Ahmad Dahlan University (UAD) for the period 2011-2014 with the executing is department of math and science education that includes math education, biology education, and physics education.

In the mathematics education study program of UAD, lesson study activity in odd semester in the academic year of 2013/2014 applied to discrete mathematics subject which is a compulsory subject with 2 credits. The problem that will be solved in the implementation of LS on discrete mathematics subjects was the lack of students' activeness in the lectures activities. Based on observations and discussions with colleague who teach discrete mathematics subject, the problem should be sought immediately the solution were (1) a lack of interaction between students and students to lecturer, (2) lack of student courage to express their opinions, (3) the passive students during lectures, (4) most of the

students silent and did not respond to lecturer's question, (5) students were not active to ask to either the lecturer or their friends if there were material that has not been well understood. Through lesson study in discrete mathematics subject was expected there would be improvement in the quality of learning, including the student activeness and their learning outcomes as in the research of Triandani et al (2013). Since LS is a good momentum for lecturers to discuss making improvements of learning.

Beginning from those problems then the lecturers of mathematics education through lesson study activity tried to make the active learning with students as a learning center. It was chosen Problem-based learning approach because this approach is in accordance with both of the conditions of the students and the material of the subject. Problem-based learning according to the Vernon and Blake in Sockalingam (2010) propose that PBL is an instructional approach that uses problems as a context for the student to acquire both problem-solving skills and knowledge. Meanwhile, according to Graff and Kolmos (2003) Problem-based learning is an educational approach whereby the problem is the starting point of the learning process. Thus the problem-based learning can be understood as a learning approach that is characterized by the giving of the problems as a stimulus for students to practice critical thinking and problem solving skills. Problems

that used can be raised either from students or lecturers. The characteristics of problem-based learning are: (1) learning begins with a problem, (2) ensure that the problems are related to the student's real world, (3) organize lessons around each problem, not around each discipline, (4) gives a great responsibility to the learners in forming and running their own learning process directly, (5) use of small groups, and (6) requires learners to demonstrate what they have learned in the form of a product or performance.

Lesson study (LS), in Japanese called the *jyugyou kenkyuu*, is an approach to make improvements of learning in Japanese. The improvements of learning are done through processes of collaboration among teachers (Santayasa, 2009). The implementation of lesson study in the lecture can develop the professionalism of lecturers. This is because the continuous of LS will provide eight opportunities for lecturers (model and observer) which relate closely to the lecturer's professional development, namely (1) determining learning objectives that match the needs of the student, (2) reviewing and enhancing learning that are beneficial to students, (3) deepening the knowledge of the learning material presented by the lecturer, (4) determining the long-term goals to be achieved by students, (5) planning collaborative learning, (6) analyzing both of the learning process and student behavior carefully, (7) developing a reliable knowledge of learning, and (8) reflecting on their learning implementation based on the development of both students and colleagues. There are three phases of the lesson study. They are planning (plan), implementation (do) and reflection (see).

Activeness according to Asnawi (2011) is in the process of learning occurs atmosphere so that students actively asking a questions and expressing an opinions. Meanwhile, according to Sriyono (1992), activeness is at the time a teachers teach, they must manage so that their students be active physically and spiritually. Learning is an active process of students to form the knowledge. According to some experts quoted Sardiman (2012,) about learning definition such as; 1) Cronbach provided a definition: Learning is shown by the change in behaviors as the result of experience, 2) Harold Spears said Learning is to is observed to read, to imitate, to try something themselves, to listen, to follow direction, 3) Geoch said learning is a change in performance as a result of practice. Also according Sardiman (2012) learning is a changing in behavior or appearance, with a series of activities for example by reading, watching, listening, imitating etc. So learning can be understood as a change in the behavior of individuals towards a better life. Activeness of learning occurs in all learning activities are incarnated in the form of listening, discussion, solving a problem and giving an opinion.

Thus it can be understood that the student learning activeness is a learning activity in which students engaged actively in discussions, ask a questions, answer a questions and express opinions.

Active learning is a learning that provides learning opportunities itself or doing their own activities. Active learning activities according to Asnawi (2011), among others, are: experience, interaction, communication and reflection. Student activeness during the learning can be seen from: (a) The enthusiasm of students in the joining of learning (b). Student interaction with lecturer, (c) the interaction among students (d) Collaboration of group (e) Activities of students in the group, and (f) Students' participation in the concluding the result of discussion.

## 2 METHODS

Lesson Study activity in order to enhance the learning activeness of students in discrete mathematics subject with a problem-based learning approach in the Mathematics Education Program Study involved 18 lecturers in the mathematics education program study who acted as one model and 17 observers. Therefore special on Tuesday have agreed no mathematics education's lecturer who teach except a lecturer who appointed a lecturer models, so that all lecturers can participate actively in the implementation of Lesson Study. Lesson study participants were students of Mathematics Education 7th semester grade D with number 56 students. Activity of lesson study was carried out 4 times of meeting where at each meeting includes plan, do, see phase.

In the plan phase, all the lecturers involved in the lesson study discussed to identify learning problems, design a learning device that includes lesson plan, student worksheet and the observation sheet. The observation sheet was used to observe the student learning activeness. The next phase was the do phase do. At this phase, the lecturer models did her learning while observers observed learning process, especially the student learning activeness. The last phase is see phase, at this phase all of the lecturers involved in the lesson study gathered to reflect on the implementation of learning and the observation of the students that took place during the do phase. The result at this phase was used as a material of improvement in the planning of plan phase for the next meeting.

The data of student activeness obtained using the observation sheet then analyzed by quantitative descriptive method to determine a criteria of the student learning activeness level after implementation of LS. Observation sheet that prepared Guttamen scale form by category options "yes" and "no" with the meaning of percentage for good categories if the score is more than 50, enough categories if the score equal

to 50 and the less category if the score is less than 50 (Sugiyono, 2012) Before the implementation of lesson study, students were informed about the implementation of lesson study so they were ready for learning during learning of discrete mathematics subject in the implementation of lesson study.

### 3 RESULTS AND DISCUSSION

During learning process of discrete mathematics subject using problem-based learning approach in the implementation of LS students was grouped into 10 groups which each group consisted of 5-6 students. The forming of a group was done randomly by considering the force and gender. Students are given a student worksheet which contained the problems to be solved along with the group then presented in front of the class.

During the learning activity, each observer used the observation sheet to observe student learning activeness, especially for monitor the student learning activeness. The results of these observations were used as the data of student learning activeness during the lesson study implementation. Furthermore, the data were analyzed descriptively quantitatively to determine whether or not an enhancing of the student learning activeness in the discrete mathematics subject using problem-based learning approach in the implementation of lesson study. The results of the data analysis of student learning activeness were shown in the following table.

Table 1. Percentage of student learning activeness

Indicator	Meeting			
	I	II	III	IV
The enthusiasm of students in the joining of learning	89.41%	79.50%	82.93%	89.30%
Student's interaction with lecturer	35.29%	44.50%	43.41%	57.67%
The interaction among students	45.29%	56.00%	49.76%	53.49%
Collaboration of group	64.12%	64.00%	62.44%	71.63%
Activities of students in the group	70.59%	75.50%	68.29%	75.35%
Students' participation in the concluding the result of discussion.	39.41%	55.50%	52.68%	59.07%
Percentage of activeness	57.35%	61.67%	59.92%	67.75%

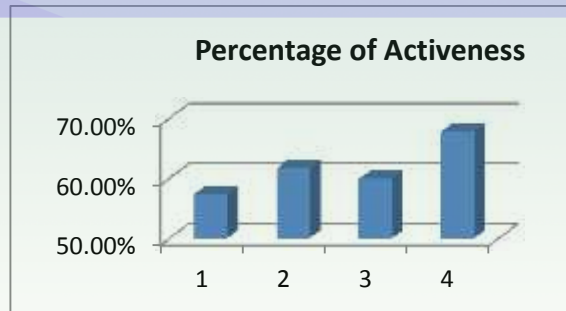


Figure 1. percentage of student learning activeness in each cycle.

Table 2. Enhancing of the student learning activeness

No	Indicator	Enhancing of each indicator of activeness		
		1 <sup>st</sup> cyle to 2 <sup>nd</sup> cyle	2 <sup>nd</sup> cycle to 3 <sup>rd</sup> cycle	3 <sup>rd</sup> cycle to 4 <sup>st</sup> cycle
1	The enthusiasm of students in the joining of learning	-9.91%	3.43%	6.37%
2	Student's interaction with lecturer	9.21%	-1.09%	14.26%
3	The interaction among students	10.71%	-6.24%	3.73%
4	Collaboration of group	-0.12%	-1.56%	9.19%
5	Activities of students in the group	4.91%	-7.21%	7.06%
6	Students' participation in the concluding the result of discussion.	16.09%	-2.82%	6.39%
Enhancing of activeness		4.32%	-1.75%	7.83%

Table 1 shown that the score of student learning activeness enhanced during implementation of lesson study using the PBL approach which taken place for 4 meetings/cycles with student learning activeness criteria in good category. In the first cycle of the LS, the indicators 1,4,5 of learning activeness were indicators that has a high scores. In the indicator 1, related to the enthusiasm of students in the joining of learning was better than before LS activity as possible learning approaches applied by lecturer was a relatively new in the classroom so that the students were very enthusiastic to join the learning. Setting of learning by a group and giving problems in the student worksheet to be solved by group member provided opportunities for students to collaborate and discuss with the group in order to solve the existing problems.

While student interaction with lecturer and among students were still lacking by looking at the acquisition of those indicators was in the not good category. Based on fact in the classroom in the classroom it shown that students still look shy to ask the lecturer, students prefer to keep silent or ask to their friends if there was material that was poorly understood. Students were less brave in asking to

lecturer directly, they prefer to ask their friends who considered smart or brave to inquire into lecturer. Students were only interacting with the friends who seat closest. This was possible also because during the learning in the LS activity, there are many observers in the classroom who caused students felt a little awkward and ashamed to ask or answer questions of lecturers because they worried if the question was too easy or if the answer was wrong then they will be laughed in the class. This fact also triggered the reluctance of students to participate in the conclusion of the results of discussion. It may be seen from the low scores on the 6<sup>th</sup> indicators. These habits should not be preserved during the learning activity. Overall percentage of student learning activeness in cycle 1 was in good category. Although there were score of three indicators of the student learning activeness were still not good.

Based on table 2, in the second meeting of the LS activity occurred enhancing of student learning activeness of 4.31%. Score of 4 indicators of learning activeness increased significantly, while score of the indicator 1 and 4 of the learning activeness decreased. At this second meeting, there were some students who first attended the lectures of discrete mathematics because they still followed the field experience practice in the school. So they did not know enough about the learning that was used by lecturers. As a result, when they worked with their group they were unfamiliar and a little awkward to interact. Moreover most of these students did not know each other because of different batch. This case possible caused the score of 1<sup>st</sup> indicator about enthusiastic students in the joining of learning was decline of 9.91%. Likewise for the decline in the score of 4<sup>th</sup> indicator which associated with collaboration of group. Students precisely formed two internal groups that discuss different issues of the existing problems in the student worksheet. This indicated a lack of group coordination so that each student was busy working on worksheet with a friend who was sitting nearby. Therefore, in the third cycle was planned to assess the activeness of the group by providing a reward in the form of praise to motivate students during the learning process in order to be more active.

The student learning activeness precisely decreased in cycle 3. While it still in the good category and decline only 1.75%. This can be seen from score of student activeness of 5 indicators decreased. Although the 1<sup>st</sup> indicator increased by 3.43%. The decrease of activeness was possible be caused of the saturation and boredom of students towards learning are used as the research that has been done by Aprilia et al (2012). In the learning when lecturer uses learning method many times monotonously, students will feel bored and saturated. Based on the results of reflection with observers was obtained the finding that although turnover of seating position has been done so

uniformly of each group have felt sitting in the front and rear, the group that seat in front of class was still not active. They did not come forward to take a presentation. In addition, there were students from the beginning to the end of the learning process were not active at all. Students were only silent and passive during group discussion.

The finding from reflection of the 3<sup>rd</sup> cycle became concerning in 4<sup>th</sup> cycle, that was the students who have not been active since the first cycle be pursued actively by ask them to read and explain the material in front of the class. At the end of LS activity, student learning activeness increased of 7.83%. Overall score of indicators of student learning activeness have increased significantly and in a good category. In general, the student learning activeness has started to rise. The more students who want to take presentation in front of the class and respond to their friend's presentation. Some groups have already taken a discussion group, but discussions between the groups still appeared invisible. Some groups worked individual or just a discussion with his friends nearby. This was possible because there were no objects together in a group, e.g. a small blackboard in each group which made each member to focus on one object only. In addition, other possibilities were also due to the number of members of the group of 5-6 students. Perhaps if the number of members of the group was only 3 students then group discussions will go smoothly. But if this was done there would be a lot of groups and it obviously required extensive classroom. Students already used the existing handbook. This facilitated the learning process. Problem-solving skills of students were increasing.

In the figure 1, overall it shows that percentage of student learning activeness enhance during LS implementation by using PBL approach in the discreet mathematics subject although there were also declining at cycle 3. Base on table 2, the enhancing of 4.32% was at 1<sup>st</sup> cycle to 2<sup>nd</sup> cycle, 7.83% was at 3<sup>rd</sup> cycle to 4<sup>th</sup> cycle and the declining of 1.75% was at 2<sup>nd</sup> cycle to 3<sup>rd</sup> cycle.

From the implementation of LS for 4 cycles, the student was still rare to ask. Generally, students who asked at each cycle were the same person. While the other students tend to be quiet, waited for their friends asked or requested other friends to ask. It becomes a task for the lecture to think how to raise the asking ability of the students in the learning. The lecturer's efforts to activate students during the learning influenced many factors including: the number of students in a classroom, learning time, classroom atmosphere, support facilities and infrastructure. The findings for lesson study with 4 meetings can be used as considerations related to matters that affect the student learning activeness are: (1) Placement of students in the group. (2) The students' seating position. (3) Attention lecturer

during the learning process takes place. (4) The existence of reward. (5) The proportion of repeater. From those findings at least it can be consideration for the lecturers to planning their learning. Meanwhile, for the effective implementation of lesson study should involve small observer so that they do not disturb the concentration and psychological of both the students and lecturer.

#### 4 CONCLUSIONS

Lesson study activities using problem-based learning approach in discrete mathematics subject have been able to enhance the student learning activeness at class D of semester VII which totaling 56 students. The enhancing was particularly helpful in the context of academic and character formation of the students in the community. Student learning activeness in the discrete mathematics subject using PBL in the LS activity was in the good cariteria for each meeting.

#### 4 ACKNOWLEDGEMENTS

This study was supported by the Lesson Study Expansion Grant for Teacher Training Institution from The Directorate General of Higher Education, Ministry of Education and Culture Indonesia.

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## Reflection Quality Determines The Quality and Sustainability of Lesson Study In Smk Negeri 1 Subang

Deden Suryanto<sup>1</sup>

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**Abstract:** Lesson Study has been running since 2010 at SMK Negeri 1 Subang. During the implementation of lesson study, there are positive impacts and it's so significant to improve the teacher professionalization, increasing and improvement of pedagogical presentation of the learning process in the classroom. Some of the positive influence that : the teachers (100%) stated that the Lesson study was a concrete efforts to made some improving the teaching and learning quality, Lesson study has provided many benefits for an increase in teachers' creativity in managing teaching and learning in the classroom, 100% of teachers stated that Lesson study has provided increased knowledge about the learning that can be used by teachers in teaching and 100% of teachers stated that lesson study has provided an increase in the quality of teachers prepared lesson plans before teaching.

### 1 INTRODUCTION

For the learning process in the classroom, the positive effect are : Lesson study is a fun activity for the students was 96.67%, materials 87% can be easily to understood, observer presence of teachers in the classroom does not interfere as much as 56%, the rest was disturbed 44 % and the teacher is able to motivate the students to learn 92%

In addition to the positive effect above, there are also negative influences or constraints encountered in the implementation of Lesson Study. These constraints include: the teacher Time to teach was interrupted with the Lesson Study activities (100%), meaning and value in order of Lesson Study activities have not touched on aspects of the activities that are meaningful and important to the development of teacher professionalization. Even teachers eventually get bored with the lesson study activities.

There are several factors causing bottlenecks in the implementation of Lesson Study and the emergence of boredom for teachers in its implementation. These factors include the technical implementation of lesson study is conducted on the same day and hour, so that teachers feel aggrieved because their teaching hours uninterrupted. Another factor is the quality factor of an observer who is always focused on the same thing every observing in open class, the teacher eventually get bored because that was found was the same thing every activity in open class.

Solutions for improving the quality and sustainability of lesson study is the presence of a teacher giving an understanding to the observer on the level of reflection that is consistently delivered every implementation of lesson study. If the observer continuously reminded of their duties and functions as well as given the challenges associated with the quality levels of reflection, then the result will be increased (meeting 1 the result of level 4 show : 0,00, meeting 2 ; its increase to 2,86 and meeting 3 : its increase to 14,29). So the implementations of lesson study more qualified and meaningful to teachers. In the end, the

teacher felt the need for the implementation of lesson study. With the increase in the assumed implementation of lesson study will continue getting quality and continuity will be maintained, given the observer teacher already discovered the benefits and values in order of execution of lesson study. For the learning process in the classroom, the positive effect are : Lesson study is a fun activity for the students was 96.67%, materials 87% can be easily to understood, observer presence of teachers in the classroom does not interfere as much as 56%, the rest was disturbed 44 % and the teacher is able to motivate the students to learn 92%

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## 2 CONTENT

Lesson Study in SMK Negeri 1 Subang has been running since 2010 up to now. In the course of these 4 years, gained a lot of lesson study both the influence is positive or negative influence. Some positive effects of lesson study on teachers and learning process in the classroom include:

- a. For the teacher:
  1. 100% of teachers stated that Lesson study is one of the instruments made in improving the quality of teachers teaching presented in the classroom.
  2. 100% of teachers stated that Lesson study has provided many benefits for the improvement of teachers' creativity in managing teaching and learning in the classroom.
  3. 100% of teachers stated that Lesson study has provided improved knowledge of learning that can be used by teachers in teaching and learning.
  4. 100% of teachers stated that Lesson study has provided an increase in the quality of teachers prepared lesson plans before teaching.
- b. Those learning processes in the classroom:
  1. Teaching activities is a fun activity for students at 96.67%
  2. The material can be easily understood 87%.
  3. The existence of an observer in the classroom teacher does not interfere as much as 56%, the remaining 44% being distracted
  4. Teachers can motivate students to learn 92%

Negative influence of Lesson Study include:

1. Teacher teaching time disturbed by the Lesson Study activities (100%).
2. Meaning and values in order of Lesson Study activities have not touched on aspects of the activities that are meaningful and important to the development of teacher professionalization. Even teachers eventually get bored with lesson study activities.

3. Teachers (mainly) senior assume Lesson Study is an activity budget spent alone, when there are all running budget until frenetic, but when the budget is not there also no activity.

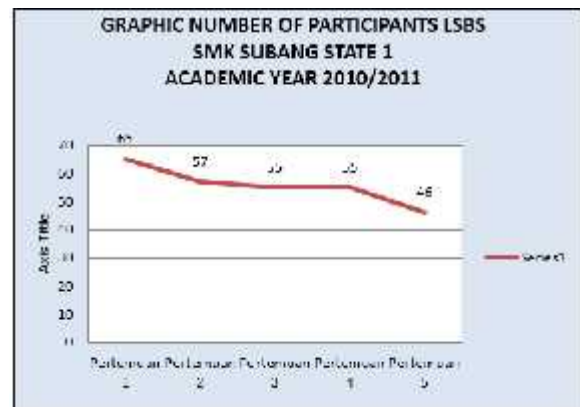
Based on the positive and negative influences on the above, there is a fundamental question that is trying described in this paper. Why teacher lesson study considers an activity that is not meaningful to teachers, so feel bored with the lesson study? Even there were positive effect resulting from the lesson study and it's so significant for increasing professionalization of teachers in implementing the learning in the classroom.

There are several factors that the author tried to lift role in this paper as the answer to the above question. Some of these factors are:

### 1. Techniques Lesson Study implementation.

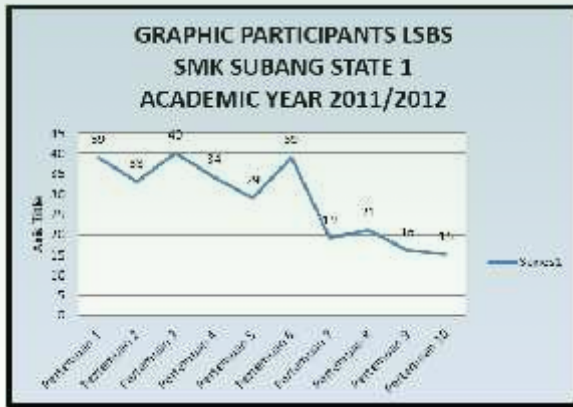
Lesson study implementation techniques is seen as an answer to the fundamental in assessing the success of lesson study. His understanding is due to the technical implementation of lesson study was conducted in a school are designated only by time (day and hour), giving rise to a sense that the same objections of teachers appointed to participate in lesson study. The reason they convey because of their teaching time in the classroom is interrupted.

Note the level of participant lesson study in SMK Negeri 1 Subang, from the period 2010 to



2012.

Based on the graph above, it can be concluded that the technical implementation LSBS in SMK Negeri 1 Subang with same day and hour, has become one of the causes of the more berkurangnya number of participants Lesson Study.



**2.1 Observer Quality**

One of the activities in the Lesson Study is the Do. This activity is carried out by the teacher in the classroom models and observed by the other participants. At the beginning of Lesson Study activities many findings and the benefits derived from the activity do this. Teachers feel and find some gaps between the plans drafted by the implementation in the classroom. Although the level of observer still struggling about what teachers do in the classroom learning activities.

The next meeting of the findings of the observer

<p><b>LEVEL 1:</b></p> <ul style="list-style-type: none"> <li>1. Judge the Model teacher / teacher Modelless.</li> <li>2. Remarks tends to be partial to good to teachers, rather than on concept-learned / students.</li> <li>3. Without a solution to the way student learning.</li> </ul>	<p><b>LEVEL 2:</b></p> <ul style="list-style-type: none"> <li>1. Has led to student comments and suggests result.</li> <li>2. Brief low accuracy rate course (what students do or the concept only).</li> <li>3. Not one comment related to other comments.</li> </ul>
<p><b>LEVEL 3:</b></p> <ul style="list-style-type: none"> <li>1. Comments combining students, the concept being taught and better solution or a wider audience.</li> <li>2. Comment discusses the ways how students learn it.</li> <li>3. Shows model because what the teacher models do, but tell the what we should do in order to learn the students.</li> </ul>	<p><b>LEVEL 4:</b></p> <ul style="list-style-type: none"> <li>1. Focusing on cognitive experienced by students.</li> <li>2. Focusing on the process of establishing a way of thinking / cognitive experienced by one of the students / ideas.</li> <li>3. Suggestion begins with learning objectives.</li> <li>4. Suggestion leads to the way of the student's learning from the beginning to the end, or at least until the finish in cognitive achievement of learning objectives.</li> </ul>

still revolve around teacher and learning activities, so that the problems that arise and have found similarities between the open lesson with each other. This has led to boredom for teachers to continue to follow the observer lesson study because they tend to think of the problems found with the same or a similar solution called it-that too. Ultimately observer even chatting in class and disrupt the learning situations in the classroom.

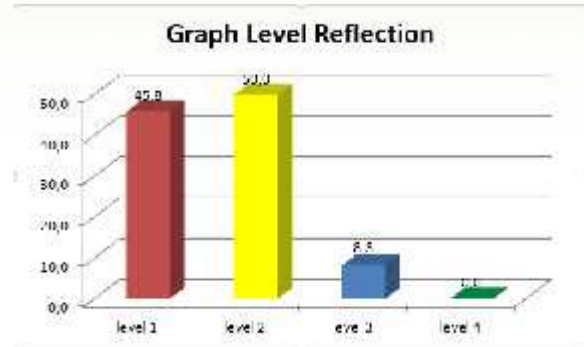
At the beginning of the school year 2012/2013, UPI PHKI provide training how to be a good

observer to be a reflection of the level of quality and meaningful to the improvement of teacher professionalization. There are several levels of reflection that determine the quality of lesson study. These levels include:

Levels mentioned above, presented in an effort to improve the quality of reflection by providing a challenge to the observer to improve the quality of the class based on your observations at these levels.

The results obtained after the exposure levels of reflection are as follows:

1. Meeting dated 24 September 2012. At this meeting presented on reflection levels to



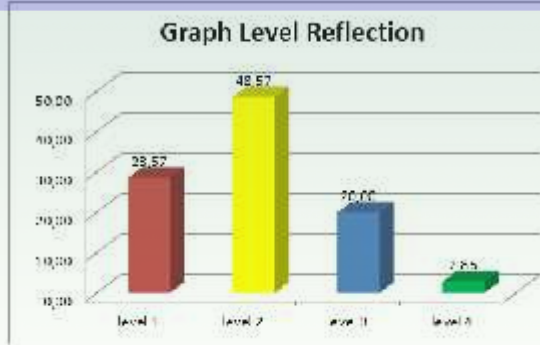
participants Lesson Study. The results obtained are:

- a. The graph of level reflection was show :



The following observations focus participants in the open lesson:

2. Meeting dated October 8, 2012
  - a. Level Reflection chart is as follows:



The graph of the above table is presented as follows:

Based on the above data it is concluded that: If the observer continuously reminded of their duties and functions as well as given the challenges associated with the quality levels of reflection, then the result will be increased. So the implementations of lesson study more qualified and meaningful to teachers. In the end, the teacher felt the need for the implementation of lesson study

b. Participant observation chart Focus Lesson study:



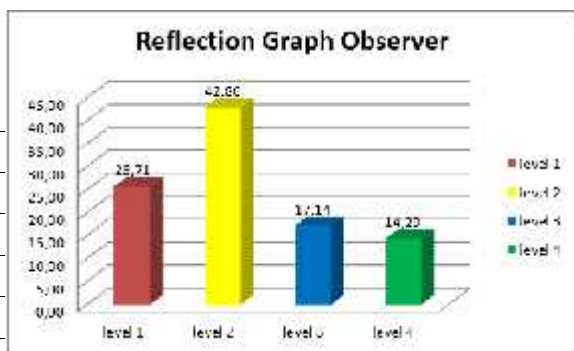
### 3 CONCLUSIONS

1. Lesson Study has been running since 2010 at SMK Negeri 1 Subang. During implementation impact of much positive and significant increase in both increased teacher professionalization and improvement of pedagogical presentation of the learning process in the classroom. Some of the positive influence that teachers include 100 % of teachers stated that Lesson study is one concrete efforts made in improving the quality of teaching and learning , Lesson study has provided many benefits for an increase in teachers' creativity in managing teaching and learning in the classroom , 100 % of teachers stated that Lesson study has provided increased knowledge about the learning that can be used by teachers in teaching and 100 % of teachers stated that lesson study has provided an increase in the quality of teachers prepared lesson plans before teaching .

For the learning process in the classroom, the positive effect is produced by KBM Activity Lesson study is a fun activity for the students was 96.67 % , materials 87 % can be easily understood, observer presence of teachers in the classroom does not interfere as much as 56 % , the rest was disturbed 44 % and the teacher is able to motivate the students to learn 92 %

2. Besides the positive effect of the above, there are also negative influences or constraints

3. Meeting dated October 22, 2012



a. Graph Level Reflection:

4. Focus Charts Lesson Study Participant Observation

Based on the results of Lesson Study for 3 meetings over generalizing the results obtained as the table below:

Meeting
Meeting 1
Meeting 2
Meeting 3

encountered in the implementation of Lesson Study. These constraints include: Time to teach the teacher interrupted the Lesson Study activities (100%), meaning and value in order of Lesson Study activities have not touched on aspects of the activities that are meaningful and important to the development of teacher professionalization. Even teachers eventually get bored with lesson study activities.

3. There are several factors causing bottlenecks in the implementation of Lesson Study and the emergence of boredom for teachers in its implementation. These factors include the technical implementation of lesson study is conducted on the same day and hour, so that teachers feel aggrieved because their teaching hours uninterrupted. Another factor is the quality factor of an observer who is always focused on the same thing every observing open class, the teacher eventually get bored because that was found was the same thing every activity open class.
4. Solutions for improving the quality and sustainability of lesson study is the presence of a teacher giving an understanding to the observer on the level of reflection that is consistently delivered every implementation of lesson study. The results showed that there were increased levels of reflection every lesson study activity and an increased focus on observations every open class implementation. With the increase in the assumed implementation of lesson study will continue getting quality and continuity will be maintained, given the observer teacher already discovered the benefits and values in order of execution of lesson study.

## The Implementation of Pair Work Method in Teaching Grammar iii Through Lesson Study Activity at STKIP PGRI Pasuruan

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**Abstract:** Among the various numbers of English learning components, Grammar or language structure is considered important component in communicating. This is proven by many students still in doubt and scared in communicating by using English due to, other than lack of vocabulary, their fright in making mistakes of the appropriate grammar. It looks like this students' problem in communicating will still going on considering most Grammar classes nowadays are tend to have a full-tense and quiet atmosphere. Thus, one of the ways which can be used to arouse the students' interest in Grammar lesson is by creating as lively and motivating as possible atmosphere to study longer. In order to manage a supportive situation for students to comprehend Grammar material deeper, pair work method can be used where students are able to have a friend/partner to practice their well-structured grammar in communicating or to ask language structure problem they have not fully understood. In fact, understanding concept in a Grammar lecture is not as easy as it looks. Especially if the class has a heterogeneous students, since every student does not have the same ability in understanding a material. There will be students who belong to the low ability zone in understanding a material. Through this consideration, in this research based article, the researcher would like to know whether the pair work method can help the students in understanding the grammar concept easier. This research was done through the Lesson Study activity of the English Education Department at STKIP PGRI Pasuruan especially for the third semester students

**Keywords:** Pair work, grammar

### 1 INTRODUCTION

Grammar is one of a tertiary level subject which must be taken by the college students in STKIP PGRI Pasuruan. There are four levels in Grammar subject, which are Grammar I, Grammar II, Grammar III, and Grammar IV. Grammar cannot be said as an easy subject for the students. Based on the researcher's experience in teaching, the students are still having problems in understanding the structure concept which must be understood in producing appropriate sentences based on a particular rule. This condition might be due to the burden that the students must take by themselves in understanding and doing the tasks given by the teacher/lecturer. Therefore, the researcher would like to implement the pair work method in Grammar III learning process for the third semester students at STKIP PGRI Pasuruan.

In implementing the pair work method, the students are able discuss and work together in solving a problem. According to Case (2008), there are a few good reasons to use pair work method in learning English, they are: there are more time to talk, able to train the students to speak, decreasing embarrassment, fun, students get more attention, a reflection toward mistakes, smoothness, exercises,

and a more dynamic class. Ber íková (2007) also added that pair work gives the chance for students to talk in a comfortable atmosphere, it also increases cooperation among students due to the students centered character, so that pair work gives the chance for teachers to keep their eyes on the students when they are having a discussion or when they are doing the exercises and able to know their difficulties and development.

There are some studies and articles that had been done related to pair work, one of them is Ber íková (2007) which concluded that students are likely and tend to work in pair with a friend though not always having the same partner all the time. However, she also added that students are likely to have a self-paired partner though they might be paired with someone they do not feel comfort with. A pair-work activity is considered helpful for weak students if the pairing arrangement done by pairing them with other brighter students so that they can help each other. The second idea was proposed by Sert (2005), he concluded that giving a pair-work task showed a positive contribution in an academic or social level.

Based on the explanation above, this research is intended to know whether pair-work method can be used to improve the students' ability in understanding the grammar concept which was done through the lesson study activity of the English

Education Department at STKIP PGRI Pasuruan especially for the third semester students. During this activity, the researcher also used some teaching aids as a media such as worksheet and movie clip videos. Those media were used to minimize the time in explaining the material or lecturing so that there were more time used by the students to interact in pair.

## 2 METHOD

This research based article used the Lesson Study steps/procedure in doing the activity; among others are plan, do, and see. The researcher did the “Plan” together with the other teachers who are also teaching in STKIP PGRI Pasuruan. We did the plan a week prior to the open class activity as well as choosing the appropriate material and the teaching media.

After dealing with the plan, the researcher did the open class and being seen by the other members of the team as observers. This “Do” step was done for 4 meetings. Here, the observers examined whether the plan was done well and how it affected the students. Then, the last was doing the “See” step after the open class. The researcher and the observers discussed the findings they found in the classroom and planned a better design for the following open class.

The open class was done to the third semester students of Grammar 3 class which consisted of 30 students. While the materials taken were Perfect aspects for the first meeting, Future forms for the second and third meetings, and Passive voice for the fourth meeting. The materials were taken from Grammar book and the internet.

## 3 FINDINGS AND DISCUSSIONS

In the first open class, the students were able to concentrate well though some students who were sitting on the back row seemed lack of focus. The pair work activity was not running well entirely. Some students tend to rely on their partner rather than doing the task together as a group. This was shown when the students have to answer a certain question; instead of being confidence in answering the question, they asked their partner for the answer. Brown (2007:228) stated that this condition might happen due to the individuality of some students since not all students are willing to share their ideas and prefer to work alone.

Reflecting from the previous open class, in this second open class, the researcher as well as the

Lesson Study Team tried to take control on the students’ focus by giving random questions to each student individually after they did the worksheet. Pair work activity was done quite well and showing a positive result since the students were pairing themselves with a partner they wished. This way, they can do better cooperation though some students were still tend to rely on their partner in doing the task. This condition supported by Ber íková (2007) who stated that students are likely to have a self-paired partner though they might be paired with someone they do not feel comfort with.

As well as the second open class, in this third open class, the researcher and the Lesson Study Team kept on giving random questions to each student individually after they did the worksheet to take control on their focus. Although they still did grammatical mistakes in doing their worksheet, but they seemed reluctant in confirming them to the teacher. As Brown (2007:228) said that students’ errors will be reinforced in small group where students will simply reinforce each other’s errors and the teacher will not get a chance to correct them.

Concerning to the conditions happened in meeting 1 until meeting 3, the researcher and the Lesson Study Team decided to use a Movie Segment Videos to keep the students on the track of paying their attention during the course. They still did the task in a pair work after watching the movie segment videos. The pair work activity was running well since they were able to discuss the task more attractively and the task given was based on the movie segment videos, too. Watching the movie segment videos seemed creating a more comfortable environment since the students were able to communicate well with the pair and becoming more open to deliver their answers. According to Ber íková (2007), pair work gives the chance for students to talk in a comfortable atmosphere. Brown (2007:225) also added that group work offers an embracing affective climate where each individual is not so starkly on public display, vulnerable to what the student may perceive as criticism and rejection.

Below is the table of the students’ score during the open class activity:

Table 1. Students’ Grammar Score

Score	Total				Category
	Open class I	Open class II	Open class III	Open class IV	
91-100	-	-	-	2	Excellent
84-90	5	4	6	7	Very Good
77-83	8	6	9	5	Good

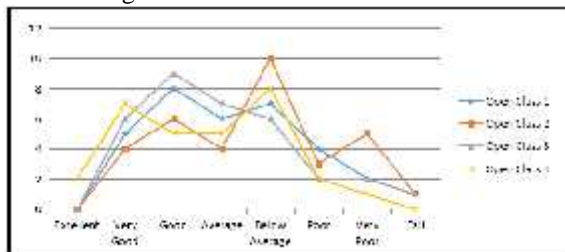
71-76	6	4	7	5	Average
66-70	7	10	6	8	Below Average
61-65	4	3	2	2	Poor
55-60	2	5	2	1	Very Poor
0-54	1	1	1	-	Fail
N	33	33	33	30	
Total Score	2343	2178	2343	2310	
Mean	71	66	71	77	

The table showed an increasing score got by the students during the Grammar III course by using pair work method through Lesson Study Activity. Though there is a decreasing score in open class 2, the students were able to gain more score in open class 3 and open class 4.

In order to have a more in depth figure about the above table (Table 1), below is the figure showing the same data about the students' Grammar score during the open classes: ability; second, students are being paired with someone they feel comfortable with; third, teachers are able to control the students' activity during the pair work in order to minimize grammatical mistakes; and fourth, using an attractive teaching aid which can pull the students' attention together.

Considering those circumstances, there are some suggestions which might be useful for other Grammar teachers in applying this pair work method: first, knowing each student's ability will be much helpful for the teacher to arrange the pair work group; second, it is okay to have students pairing with someone they feel comfortable with, but this cannot happen all the time, so teachers may switch between one and another pair so that in the end, they would feel comfortable to be paired with everyone in the class; and third, use an attractive teaching aid to replace the teacher's explanation which the students thought it might be a bit boring to have only listening to a lecturing activity.

Figure 1. Students' Grammar Score



## 4 CONCLUSIONS

After finishing the open classes for four meetings in Grammar III course, it can be concluded that the implementation of pair work method can be used to improve the students' ability in understanding the Grammar concept since they got more chance to ask and gain more information from their partner/pair intensively during the pair work activity. However, this condition may happen in a certain circumstances: first, students of better ability are willing to share their knowledge with students of lower ability; second, students are being paired with someone they feel comfortable with; third, teachers are able to control the students' activity during the pair work in order to minimize grammatical mistakes; and fourth, one and another pair so that in the end, they would feel comfortable to be paired with everyone in the class; and third, use an attractive teaching aid to replace the teacher's explanation which the students thought it might be a bit boring to have only listening to a lecturing activity.

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## Improving Students’ Scientific Ability through Lesson Study-Based Mathematics Learning

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**Abstract:** Students’ scientific ability is the main concern of every lesson carried out by teachers in Indonesia nowadays. Learning process based on students’ scientific ability was designed such that the students may construct the concept through observation step (to identify or find the problem), design the problem, give the hypothesis, collect the data, analysis the data, make the conclusion and communicate the funded concept. Therefore, improving students’ scientific ability will students’ ability in problem solving and develop students’ positive characters. In this study, three students from 7<sup>th</sup> grades SMP Negeri 1 Jember were randomly selected to observe their scientific ability. The observation was focused on how they were observing, questioning, associating, experimenting, and networking to solve some problems related to mathematics. Periodic observations were conducted during the open classes, one of the stages in the lesson study procedure, in each cycle conducted by the lesson study team members consisting of one teacher and three observers. There was an improvement in scientific ability from three selected students during the third open class compared to the first and the second open classes after reviewed collaboratively by the lesson study team members. In the first open class, two students couldn’t solve the problems correctly because they didn’t comprehend what was the given and which was asked in the problems. In the second open class, three students were able to solve the problems correctly but they couldn’t make the conclusion and communicate that result. However, in the third open class, three students could solve the problems by observing, questioning, associating, experimenting, and networking correctly. Therefore, it can be concluded that there was an improvement in students’ scientific ability after participating in the lesson study-based mathematics learning.

**Keywords:** Students’ Scientific Ability, Periodic observations, Mathematics Learning, Lesson Study.

### 1 INTRODUCTION

The curriculum in Indonesia has been changing and developing overtime and currently Indonesia has changed its curriculum from School Based Curriculum (SBC) to the 2013 curriculum. The government must have obtained a particular reason in changing the curriculum. Ministry of Education and Culture, Muhammad Nuh, stated that Indonesian education system should fit the demand of era. The currently used 2013 curriculum is expected to be a solution to improve human resources quality in Indonesia.

One of the fundamental changes in the 2013 curriculum is the approach used in the Teaching and Learning Process (TLP). The approach used in this new curriculum is scientific approach with five teaching and learning process steps. This approach is focused on how students are observing, questioning, associating, experimenting, and networking the learning material.

Scientific approach is intended to provide insight to students in recognizing and understanding various materials using a scientific approach that information can come from anywhere, anytime and does not always depend on the teacher’s information (Teacher

Centred Learning). Therefore, it is necessary to develop the students’ scientific ability, so that students are able to understand the learning material perfectly. However, many teachers find it difficult to design a study that can enhance students’ scientific ability. One of the teachers’ difficulties is that the teachers’ incapability in understanding the difficulties experienced by students in conducting scientific activity, especially in finding a mathematics concept. In this case, the teachers need the help of observers to help monitor the students’ scientific ability. The observer activity can be developed through lesson study.

Lesson study is a potent embedded peer-to-peer professional learning strategy. It requires teachers and other educators to work collaboratively and continuously based on the collegiality principles and mutual learning (Sumar Hendaya, et al: 2006). Through lesson study, teaching and learning process is developed by the community which then selecting one of the teachers to carry out the study, while other teachers observe students’ learning activities during the teaching and learning process. At the end of the activity, the teacher regroup and conduct a discussion to discuss the result of the teaching and learning process, revise and develop the next learning

program based on the result of the discussion. It is done to help the teacher to find a solution about the problems faced in the TLP. Based on the previous explanation, it is necessary to find a way to enhance the students' scientific abilities, especially in mathematics. Hence, students' scientific ability is the main concern of every lesson carried out by teachers in Indonesia nowadays. Learning process based on students' scientific ability was designed such that the students may construct the concept through observation step (to identify or find the problem), design the problem, give the hypothesis, collect the data, analysis the data, make the conclusion and communicate the funded concept. Therefore, improving students' scientific ability will students' ability in problem solving and develop students' positive characters.

## 2 RESEARCH METHODOLOGY

The three stages of the design implementation of lesson study in mathematics to improve students' scientific ability broadly refers to the Lesson Study cycle according to Lewis, they are Plan, Do and See. The lesson study is carried out for three cycles, with each cycle is focused on observing the students' scientific ability to solve some problems related to mathematics. The learning model designed in the first cycle refers to the students' learning outcomes at the previous meeting, while the learning model used in the second cycle refers to the observers' result in observing the students' scientific ability in the first cycle. The third cycle is also designed based on the result of the observers' observation on the students' scientific ability. Therefore, through these steps, it is expected that problems or difficulties experienced by students can be solved.

In this lesson study, three students from 7<sup>th</sup> grades SMP Negeri 1 Jember were randomly selected to observe their scientific ability. The observation was focused on how they were observing, questioning, associating, experimenting, and networking to solve some problems related to mathematics. Observation made for the first, second and third lessons were recorded for three students, namely student A, B, and C.

According to Wragg (1999), observations can be regarded as a method of gathering classroom evidence because it embeds student's actions and active learning process that describes and record what the students are doing. In this case, periodic observations were made on three students' participation in scientific ability at predetermined time intervals of ten minutes during the lesson from 07.00 am to 08.20 am. Periodic observations were conducted during the open classes, one of the stages

in the lesson study procedure, in each cycle conducted by the lesson study team members consisting of one teacher and three observers. There was an improvement in scientific ability from three selected students during the third open class compared to the first and the second open classes after reviewed collaboratively by the lesson study team members.

## 3 RESULT AND DISCUSSION

Learning material used in the first cycle was “sample and population” and the learning material used in the second cycle was “Probability” while in the third cycle, the application of probability in everyday life was determined as the discussion material.

After reviewing the first and the second lesson, the lesson study team and the teachers involved discussed collaboratively the lesson content and learning activities as well as the classroom discussions. A new lesson plan that comprised of agreed lesson content and learning activities as well as the classroom discussions was determined and implemented.

### The first meeting

1. Student A was able to identify what was given and which was asked in the problem. Sometimes he was able to identify what was given and which was asked in the problem after a seconds. Furthermore, he had been able to make a plan to solve the problem and communicate the reason for choosing the plan fluently and correctly. However, there were several steps of plan whereby he was able to give a reason for choosing such right after a seconds. Furthermore, he was able to do the calculations properly to obtain the proper solution of the problem.
2. Student B had not understood the whole sentences on the questions. Furthermore, he was able identify what was given and which was asked in the problem. Sometimes he was able to identify what was given and which was asked in the problem right after a seconds. Furthermore, he had been able to make a plan to solve the problems well. However, he sometimes could give reasons for choosing a plan, but the solution of the problem cannot be resolved correctly.
3. Student C had not understood the whole sentences on the questions. Furthermore, he was able to identify what was given and which was asked in the problem. Sometimes he was able to identify what was given and which was asked in the problem right after a seconds. However, he had been able to make a plan to solve the problem and communicate the reason for

choosing the plan fluently and correctly. He had also been able to do the calculations correctly, but the solution of the problem cannot be resolved well.

### The second meeting

On the second problem, Student A was able to identify what was given and which was asked in the problem. Sometimes he was able to identify what was given and which was asked in the problem right after a seconds and with a less precise answer. Furthermore, he had been able to make a plan to solve and reason the problems fluently and correctly. Student A was also able to determine the solution of problems in the second meeting properly. However, he could not make the conclusion and communicate that result to his group, so could not Student B and Student C.

### The third meeting

Student A said that he was able to understand the problems well. Furthermore, he was able to identify what was given and which was asked in the problem fluently and correctly. Sometimes he was able to identify what was given and which was asked in the problem right after a seconds. Furthermore, he had been able to make a plan to solve the problem and communicate the reason for choosing the plan fluently and correctly. In addition, he also changed the problem solving steps because he thought that the steps he set earlier was incorrect. Furthermore, he was able to do the calculation correctly to obtain the solution of the problem. After finding the solution of the problem, the student made the conclusion related to the problem and communicate that result to his group, so did Student B and Student C. However, Student B and Student C did feel so embarrassed that they were not able to communicate the conclusion of the problems well. It was caused by their uncertainty on their solutions.

Based on the analysis above, it is badly needed to have a change in teaching and learning process that

teachers should be more facilitating students to be more open when they experience problems. It must be done to improve students' confidence in delivering something.

## 4 CONCLUSIONS

There was an improvement in scientific ability from three selected students during the third open class compared to the first and the second open classes after reviewed collaboratively by the lesson study team members. In the first open class, two students couldn't solve the problems correctly because they didn't comprehend what was the given and which was asked in the problems. In the second open class, three students were able to solve the problems correctly but they couldn't make the conclusion and communicate that result. However, in the third open class, three students could solve the problems by observing, questioning, associating, experimenting, and networking correctly. Therefore, it can be concluded that there was an improvement in students' scientific ability after participating in the lesson study-based mathematics learning.

## 5 ACKNOWLEDGEMENTS

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## Enhancing Students’ Self-Confidence Through Teacher’s Behaviour Change on Lesson Study Program For Teyl 1

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**Abstract:** In the newest education curriculum namely curriculum 2013, Indonesian government focuses on building good character for citizen in several aspects which covers religion, social, knowledge, and skill. In order to succeed the government mission to build a good character for the citizen, teachers and lecturers should integrate character building through learning process in the classroom. It can be done by creating a good atmosphere through teacher’s behavior change in the classroom so that the students can enjoy studying so that their good character can be developed. During the team conducted lesson study, self-confidence was chosen to be the main character which was developed. This study proposed to find out how students’ self-confidence can be enhanced through teacher’s behavior change on lesson study program for TEYL 1. The result of the study showed that the students’ self-confidence were enhancing due to the teacher’s behavior change.

**Keywords:** enhance, student’s self-confidence, teacher’s behavior change, lesson study

### 1. INTRODUCTION

Nowdays there are many Indonesian people get moral and attitude crisis. Drug abuse, hostility, plagiarism, cheating, corruption, and social unrest are the examples of negative phenomena that happen in Indonesia. Unfortunately, the doers of negative phenomena are not only ordinary people but also educated people in government system. It is also done by young people to mature people. Furthermore, it also happens not only in a big city but also in rural area. This condition can be solved through education system. Due to solve the problem on moral and attitude crisis, Indonesian government realize Curriculum 2013 as the solution to build good character for Indonesian people through education. Curriculum 2013 aimed at preparing and facilitating Indonesian people to have life skill as an individual with good faith in religion, productive, creative, innovative, affective, and enable give valuable contribution for society, nation, and world civilization (Regulation of Education and Culture Minister No.69, 2013).

The core concept of curriculum 2013 is to prepare graduates to have good and strong faith in religion, social, knowledge, and life skill. Curriculum 2013 views that the balance of knowledge, skill, and attitude is the main foundation in building soft and hard skill for life (Setiyawan, 2014). Hopefully, graduates of curriculum 2013 will survive and are successful in

their life so that they can hinder the moral and attitude crisis in Indonesia.

Concerning on the concept of curriculum 2013, character building can be implemented in all level of education that it covers elementary school, junior and senior high school and university level. In university level, character building can be implemented in the classroom during teaching and learning process. During teaching and learning in the classroom lectures are addressed to build good character to the students by giving a model as lecturer with good character, learning activity, giving assignment, etc.

English department at University of Nusantara PGRI Kediri provides English pre-service teacher program has mission to graduate the English teachers who have a good English skill and entrepreneurship skill, enable to produce qualified English work, and participate in social life actively. In order to reach this mission, English Department provides the students with various subjects to fulfill their competence as a skillful and professional English teacher. Teaching English to Young Learners 1 (TEYL 1) is one of the subjects that it is given to the students that discuss about how to teach English to young learners theoretically and practically.

In line with the English department mission, ideally, students should have good characteristics such as high self-confidence, innovative, active and creative. On the other hand, the fact showed that

only a small part of students in classroom who participate actively during teaching learning process in TEYL 1 (9 students = 25% from 36 students). The students are categorized as active students if they (1) actively pay attention when lecturer delivers materials; (2) actively ask question deals with the material that they do not understand yet; (3) actively answer the lecturer’s question that its aim is to clarify the students understanding; (4) actively give a comment and suggestion for others presentation and performance. The rest of the students showed that they had low self-confidence so that they could not fulfill the requirement of active students. According to the result of the observation, it could be reported that when the lecturer gave a chance to the students to ask question about material – some students made a note about her/his question then gave it to her/his friend, some students did discussion with their friend then when the lecturer came to their seat and asked about the problem they nodded their head, then the rest of them were silent, played their mobile phone, or chatted with their pair.

To solve the problem in the classroom, the writers decided to change their behavior in teaching TEYL 1. The decision is considered the result of self-correction during *Lesson Study* (LS) program. Before join LS, the lecturer rarely did self-reflection on the way she taught students. When she did self-correction and changed the teaching process, she only focused on herself. The result, when the leaning process was not as successful as what she expected, she blamed the students. In addition, before joined LS, learning process tend to teacher center approach.

Having LS program, the writers get more experience and suggestion from the other lecturers who become a member of LS team. According to the results of discussion conducted by the LS team, it was suggested that the writers should change her behavior in teaching TEYL to enhance the students’ self confidence. The teacher’s behavior change covers the model of interaction, the way of giving reward to the students who are actively and confidently participate in the classroom, and the way of giving feedback.

Considering to the problems happen in the classroom and the suggestion from LS teams and their experience in teaching, the writers believe that teacher’s behavior change can enhance the students’ self confidence for TEYL 1 class. This study aims at finding the answer 1) Can teacher’s behavior change enhance the students’ self-confidence? 2) How is the class climate when the teacher change her behavior in the class.

## 2. THEORETICAL REVIEWS

### 2.1 Self –Confidence

Self-confidence can be separated with our life. Having self-confidence whether it is low or high, it gives an effect to our life. Self-confidence is essentially an attitude which allows us to have a positive and realistic perception of ourselves and our abilities (Goel & Aggarwal, 2012). Someone who can be categorized as self confidence person if she/he has attributive personal such as assertiveness, optimism, enthusiasm, affection, pride, independence, trust, the ability to handle criticism and emotional maturity. Furthermore, a self confident person perceives himself to be socially competent, emotionally mature, intellectually adequate, successful, satisfied, decisive, optimistic, independent, self-reliant, self-assured, forward moving, fairly assertive and having leadership qualities.

In addition, Basavanna in Goel & Aggarwal (2012), “Self Confidence refers to an individual’s perceived ability to act effectively in a situation to overcome obstacles and to get things go all right.” It can said that self confidence is a positive personal perception our self to solve any kinds of obstacles and to think that everything can be done perfectly. Having self confidence, it does not mean that a person always can reach what she/ he want, enable to solve all problems but she/he enable to look at what is happening in a positive point of view. In sum, the value of Self Confidence plays an important position in human behavior and personality and is regarded as a basic condition of human existence in modern day world by many thinkers.

### 2.2 Teacher’s Behavior Change

Change is considered as the result of self correction and self reflection due to reach better result. Teachers are used to change how they teach to get better learning outcomes for their students. This change tends referring to the positive change. Pennington (1990) in Richard, Gallo, & Renandya (2001: 47) stated that positive change is a central to the professional life of a teacher. It means that to become a professional teacher, a teacher should do any kind of changes in teaching and learning process. It cannot be limited in time but it is done based on the condition and situation in the class. In addition, Freeman (1989) in Richard, Gallo, & Renandya (2001: 47) describes a number the notions of change:

- 1) Change does not necessarily mean doing something differently; it can mean a change in

awareness. Change can be an affirmation of current practice..

- 2) Change is not necessarily immediate or complete. Indeed change occur over time, with the collaborator serving only to initiate the process.
- 3) Some changes are directly accessible by the collaborator and thereafter quantifiable, whereas others are not.
- 4) Some types of change can come to closure and others are open-ended.

Barley (1992) reported a number of changes that are usually done by the teaching during teaching practices. These changes cover sixteen separate changes as follow:

- 1) Teacher-centered classes were made more students-centered
- 2) Use of more varied, authentic materials
- 3) Earlier focus on accuracy changed to communicative competence
- 4) Decrease the explicit teaching of rules in grammar instruction
- 5) Change in attitude
- 6) Use of group work begun or improved
- 7) Increased use of tasks and students-generated projects
- 8) Changes in procedures for teaching children

Furthermore, the source of teacher change can shaped from several conditions and activities. Vonk (1991) in Richard, Gallo, & Renandya (2001: 50) identified that complex interaction as the moment that promotes teacher change. Complex interaction can assumed as the interaction which involves teacher, colleagues, teacher trainers, and it is possible, a group of students. Having discussion, formal and informal feedback from collaborators, and the interactions with the colleagues, the ideas of change the teaching practice begun to appear. In addition Baley (1992) identifies six other sources for teaching change.

- 1) Dissatisfaction with the current situation
- 2) The connection of a new idea with the teacher's own situation
- 3) A change in the teaching context
- 4) Life changes and personal growth which led to professional development
- 5) A realization of something based on his or her experiences as a learner
- 6) A conflict between the teachers' new beliefs and their practices

Based on the explanation about change, the writers identifies that her change in teaching practice are teacher centered class to students centered, change in attitude and change in

assessment. Change in teacher centered class to student centered class means the teacher activity will not be very dominant in classroom. The activities in the class are design to encourage student's participation. Then, change in attitude can be described as the change of giving feedback. Teacher uses positive feedback whether the students' answer is correct or wrong. By doing so, the students don't feel being blamed by the teacher. Moreover, the change in assessment deals with the change that it is done by the teacher on giving score only focuses on formal assessment to combining formal and informal assessment.

### 2.3 Lesson Study

Lesson study (LS) is an activity in which aimed at enhancing the learning outcomes and teaching process continuously through teacher group collaboration (Sudrajat, 2010). LS commonly consists of model teacher and its collaborator. Model teacher is selected teacher in which his/her teaching process will be improved. Then, collaborator is a teacher as team which help model teacher to improve her/his teaching through planning activity, observing teaching process, then giving reflection.

LS is conducted through several steps: design, implementation, testing, and improvement (Rock and Wilson, 2005: 78). Moreover, Carbin and Kopp in Sudrajat (2010) propose six steps LS include:

- 1) Form a team: select the team which covers model teacher and collaborators. It may consist of 3-6 teachers with good understanding and competence in LS program.
- 2) Develop student learning goals: team discuss the learning material for students as the result of LS.
- 3) Plan the research lesson: model teacher and its collaborator design teaching model to reach the teaching objectives.
- 4) Gather evidence of student learning: model teacher practice the teaching plan, then collaborators observe the teaching process and collect the data as the material for analyze teaching process.
- 5) Analyze evidence of learning: team discusses the result of teaching practice then analyzes its progress whether it reaches teaching objectives or not.
- 6) Repeat the process: team revises the teaching model based on the result of discussion and finding evidence in teaching practice. Then, team do the previous steps, it may be conducted 2-5 times.

### 3. METHODOLOGY

The method used by the model teacher was LS. It was conducted through six steps. According to Carbin and Kopp in Sudrajat (2010) the steps of LS cover 1) form a team; 2) develop student learning goals; 3) plan the research lesson; 4) gather evidence of student learning; 5) analyze evidence of learning; 6) repeat the process

**In forms a team,** the teacher selected the team as collaborator in LS. The team consisted of three lecturers, one lecturer as model teacher, whereas rest of them was collaborators. The lecturer of TEYL 1 was selected as the model teacher. Then the others were collaborators. After the team was settled, they divided the job descriptions for each member. Model teacher was a doer of teaching practice in which her/ his teaching process would be optimized through doing LS collaboratively. Then, the duties of collaborators were work together with model teacher to do LS that it was started with plan activity and it would be finished by analyzing the teaching process as the result of plan activity.

**Develop student learning goals.** In this stage, the model teacher and collaborators formulated the learning goals especially for TEYL 1. Standard competence for TEYL 1 was enable the students to understand the principle of Teaching English for young learners, enable to construct lesson plan based on curriculum and the characteristic of young learners. Besides, preparing the students with knowledge and skills to teach young learners, TEYL 1 aimed at building a good character for the students. According to the results of observation before LS, it showed that the students had low self confidence in the classroom. It could be seen from the fact that when the lecturer gave a chance to the students to ask question about material, some students made a note about her/his question then gave it to her/his friend, some students did discussion with their friend then when the lecturer came to their seat and asked about the problem they nodded their head, then the rest of them were silent, played their mobile phone, or chatted with their pair. The main focus of LS for TEYL 1 was to enhance the students' self-confidence.

**Plan the research lesson.** In plan the research lesson, the teacher model and collaborators identified the problem in TEYL 1, especially on students' self-confidence. The model teacher worked together with the collaborators to analyze the teaching material, constructed teaching material, composed the steps of learning and the assessment. In order to reach the learning goals that focused on enhancing students' self-confidence, they also worked together to find the strategies to overcome the problems. The result of discussion

proposed that the teacher model should change her behavior in teaching process. The teacher's behavior change covered change in teacher centered class into student centered class. It means the teacher was not dominant did the teaching and learning activities in classroom. The activities in the class were design to encourage student's participation, e.g. creating group work activities. Then, change in attitude could be described as the change of giving feedback. She used positive feedback whether the students' answer was correct or wrong. By doing so, the students did not feel discouraged. Moreover, she changed the assessment system. Before LS she give the final scores based on formal assessment, but she changed it by combining formal and informal assessment.

**Collect evidence of student learning.** The teaching practice and observation were done to collect evidence of student learning stage. The teacher model in this stage taught the students based on the lesson plan that had been made in plan stage. A the same time, the collaborators played a role as observers. While she taught the students, the observers recorded the data through observation the students' behavior and monitored the teaching process whether the teacher model did as the plan or not.

To record the progress of students' confidence, the team created a form as follows:

Table 1. The group of TEYL 1- Class 3D English Department of University of Nusantara PGRI Kediri

Group	No.	Name	1	2		16
1	1	Arief Tristian				
	2	Imanuella L.				
	3	Tri Setiyo N.				
2						

The collaborators gave a check (V) to the column if students participated actively in the class.

Besides the observation form, the team also decided to give questionnaires to the students to know their opinion after LS was conducted, e.g. the change of learning activity, their feeling when they have to participate, the advantages of LS for the students.

**Analyze evidence of learning.** This was an important stage. In this stage team analyzed the evidence during teaching process. The observers reported their results during doing observation. It covered the observation for teaching practice and the students' self-confident progress. The weaknesses of the teaching practice were analyzed then team found the solution to overcome them so that it would be happen in the teaching practice.

**Repeat the process.** Based on the result of previous stage, the team repeated the process LS which started with plan.

#### 4. DISCUSSION

After conducting LS, the writers report that changing teacher’s behavior can enhance students’ self-confidence. This can be seen from the data in the table below.

Table 2. The improvement of students’ participation

Meeting	The number of students who participate actively in the class	Presentage (%)
I	7	18,91
II	9	24,32
III	10	27,02
IV	14	37,83
V	22	59,45

From the table above, it can be seen that students’ participation in the learning activity in TEYL class encrease. In the first meeting only seven students participated by answering the teacher’ questions. In the following meetings more students took part in the learning activities. They not only answered the questions, but also initiated to give presentation and to give feedback to other students. They are also confidence to deliver ideas although their ideas sometimes were different from other students.

The following quotations were taken from the answer of the questionnaires.

Student A: *After we have agreement, I feel confident to say when there is a question from the teacher. If I have problem, I can ask the teacher freely without feeling guilty.*

Student B: *There is a big change for me. I feel more confidence when the teacher asks questions. I can express myself freely as the teacher give reward.*

Student C : *Yes, I feel more confident after LS, as my friends and teacher appreciate my ideas in the class.*

The statements above were quoted from the students’ answer written in the questionnaire. At the beginning of the meeting the model teacher made agreement with the students. The agreement was that students who participate actively during the teaching and learning process would be awarded by the teacher. The teacher noted the active students and took certain score from the participation. The

participation includes answering questions, initiating ideas to give presentation, giving judgement on students’ ideas, and responding other students’ ideas. In other words, from the students’ answer it can be concluded that they feel more confident during the teaching and learning process.

#### 5. CONCLUSION

LS can improve the process and outcome of learning. After implementing LS program that is changing the teacher’s behavior in teaching, the writers conclude that class participation and students’ self-confidence were increase in learning TEYL 1. Through LS program either teacher model or collaborators get more experiences on working together on preparing teaching material (plan), observing the teaching and learning process (do), and reflecting the process (see). Problems in teaching learning process can be solved collaboratively through LS. Finally, LS opens teacher’s thoughts and gives solution among colleagues from different point of view.

#### 6. ACKNOWLEDGMENT

It is a great experience for us to carry out Lesson Study both as a teacher model and as an observer. There are a lot of benefits by sharing ideas with colleges therefore we would like to express our gratitude to LS team from the university, English department, colleges, and all the students for the bst cooperation.

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## USING COOPERATIVE LEARNING AND PEER ASSESSMENT TO ENHANCE STUDENTS' ABILITY IN PUBLIC SPEAKING AND TO ACTIVATE LEARNING IN SPEAKING IV CLASS

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**Abstract:** This study is aimed to determine the appropriate learning methods used in the teaching learning process in Speaking IV Course. Through Lesson study activities, Lecturer can examine whether the lesson plans made were appropriately applied in class or not. Speaking IV is the final level of Speaking Course in University for English Department Students. At this level, students are targeted to be a skillful public speaker in real public environment. Students must be able to master and practice the 12 topics in public speaking, in which they had to be 12 kinds of public speakers. Implementing the lesson plan and syllabus in teaching and learning process in the classroom is not easy regarding the limited time and place allocation and also students' speaking abilities. From the Action Research done, it is found that applying Cooperative Learning Methods was able to accommodate and give students more opportunity to perform their skills in Public Speaking Practice in the classroom. This method of teaching also enhances students speaking activity, creativity and confidence to speak in public. Teaching and learning process is also considered more effective and efficient with this method application. Lesson study activities facilitate lecturer to observe the effectiveness of the application of the method used in the class. Through 4 cycles that have been implemented, including (plan, do, and see), The KBK team consisting of Lecturer models, the observers, as well as the KBK Supervisors concluded that Cooperative Learning is suitable to be applied in the Speaking IV Course. In addition to cooperative learning, Peer assessment method (by distributing the assessment instruments to students) was considered succeed in helping the students to do assessment toward their friends' performances and also evaluate their own ability in public speaking. Students can comment on each performance of each topic based on the assessment rubric that has been discussed in advanced by the lecturer at the beginning of the learning in the classroom. Besides that, Project Assignment also considered to be efficient and effective in motivating students' creativity.

**Keywords:** Lesson Study, Public Speaking, Cooperative Learning, Peer Assessment.

### A. INTRODUCTION

Lesson Study is defined as a model of professional development of educators through collaborative and sustainable teaching implementation and review among the teachers, based on the principles of collegiality to build a learning community (Herawati: 2012). Senior lecturer are demanded to work cooperatively and supportively with junior lecturers in an effort to improve the quality of teaching and learning in class. Moreover, embodied collegiality can help senior lecturers to prepare the junior lecturers to fulfill the regeneration of the expertise of teaching.

The Implementation of Lesson Study that includes three stages: plan, do, and see has given positive impacts toward the lecturers and the teaching environment in the faculty. Lesson study creates conducive teaching atmosphere

among lecturers. Lecturers become more honest and respective in giving and accepting critics and suggestions from other lecturers. They also become more reflective and sportive regarding to support the process of teaching quality improvement in the classroom. All the lecturers in KBK (kelompok bidang keahlian) team need these attitudes to enhance effective teaching and learning process as well.

*Speaking IV* course taught in English Department, Faculty of Teacher Training and Education, Muhammadiyah University is a final level of speaking course after *Speaking I, II, and III*. It is expected that at this level the student already has an advanced speaking ability. Therefore students were targeted to be a public speaker after accomplishing this course. It is also expected of students able to master public speaking skills performance in various events and places. The Model Lecturers in this research

teach and apply the syllabus that has been created by the team of Speaking Course. Students are targeted to be 12 kinds of public speakers such as; story teller, public relations officer, sales promoter, motivational speaker, political orator, master of ceremonies, TV anchor, host, etc.

The teaching learning process that has been done is individual presentation performed by the students in the classroom. This kind of learning model is considered ineffective because of the limited time of only 100 minutes lecture for each meeting and in every. While the course has 12 topics to be done in one semester, so each topic must be mastered by students in each meeting. Practically only half of students (17 students) in the class could do the presentation in each meeting (2 x 50 minutes). Each student needs at least 10 minutes for the presentation and the preparation. Beside that by having this method of individual presentation, students become passive and less interactive audience in the classroom. Students still have to be motivated by a variety of ways to become actively engaged in criticizing their friend's performances of each topic. Students tend to be passive and busy with their own activities in class and did not pay attention to their friend's presentation in class. Based on the problems stated above, it is expected that through lesson study program lecturers are able to find a solution of the problem to find appropriate learning method that can be applied in the Speaking IV course in order to improve public speaking skills of the students.

## B. REVIEW OF RELATED LITERATURE

### *Lesson Study*

*Lesson Study* is a model of learning that has meaning "study of learning." *Lesson Study* is a model of professional development of educators through collaborative and sustainable teaching learning process based on the principles of collegiality and *mutual learning* to build a *learning community* (Lewis, 2002). *Lesson Study* is not a method of learning or a learning strategy, but in *Lesson Study* activities can select and apply various methods / learning strategies appropriate to the situation, and the problems faced by teachers. *Lesson Study* can be a learning activity of a number of teachers and experts learning which includes three (3) phases of

activities, including planning (*planning*), implementation (action) learning and observation and reflection (*reflection*) of the planning and implementation of learning, in order to improve the quality of learning. In addition, according to Hendayana (2007: 10) *Lesson Study* is done continuously through three stages, namely *Plan* (Plan), *Do* (Implementation), and *See* (Reflection).

### **Phase One: Plan (Planning)**

In this phase teacher can identify the existing problems in the classroom that will be used for *Lesson Study* activities and planning for solution. Identify the problem in the framework of solving the planning problem is related to the subject (each lesson) that are relevant to the class and the class schedule, student characteristics and classroom atmosphere, method / approach to learning, media, teaching aids, and evaluation of processes and learning outcomes. Based on the results of the problem identification and solution planning discussions, then compiled and packaged in teaching equipment which includes ; Lesson Plan (RPP), Implementation Guidelines for Learning (Teaching Guide), Student Worksheet (LKS), the media or learning aids, instruments of process and product assessment, and classroom observation sheet. The making of the teaching equipment can be done by a teacher or several teachers on the basis of agreement on aspects of learning that is planned as a result of the discussion. The result of the preparation of the learning equipment needs to be consulted with a professor or teacher who is deemed an expert in the group to be refined.

### **Phase Two: Do (Implementation)**

In this phase, a teacher who has been designated (approved) by the group, implements lesson plans (RPP) which have been prepared in the classroom. Experts and other teachers made observations using the observation sheet that has been prepared and other necessary devices. The observer noted the positive and negative in the learning process, especially in terms of student behavior. In addition (if possible), made video recordings (audio-visual) that attentively captured special events made by the teacher or student during the implementation of teaching and learning process in the classroom. These recordings will be useful as authentic evidence of events that need to be discussed in the reflection stage or in seminars *Lesson Study* results, besides

it can be used as a dissemination material to a wider audience.

**Phase Three: See (Reflection)**

After the implementation of teaching (Do) teacher should do immediate reflection. At this stage of reflection, the model teacher, observers and other experts have a discussion about the process of teaching and learning that has been done in implementation process. This discussion is led by the Principal, Coordinator of the group, or teacher designated by the group. First, model teacher is given the opportunity to express his/her impressions during the performance of the teaching and tell the problems faced by his/her self and by the students during the class. Then, the observer (other teachers and experts) present the results of their observations, especially concerning the activities of students during the learning takes place, along with playback of the recorded teaching video. Furthermore, teachers who perform these implementations will provide feedback on the comments of the observer. It is important that the reflection phase reconsider lesson plan that has been prepared as a basis for improvement to the next lesson plan. Whether, the lesson plan is appropriate and can enhance the activity of the students' learning performance or not. If it does not match and support effective learning, then it needs to be considered the revision of teaching and learning methods, students worksheet, teaching aids or media, etc. this consideration are used to improve plans for further learning.

**Cooperative Learning**

According to Jacob (1999) *Cooperative Learning* is learning method, in which a group of students work together and help each other in completing academic tasks. As'ari (2001) states that in *cooperative learning*, students are not only required for individual attempt to achieve success or try to beat their friends, but students are demanded to be able to work together to achieve results together. The social aspect is very prominent and students are required to take responsibility for the success of the group. Nur & Wikandari (2000) said that students more easily find and understand the concepts that are difficult if they discuss the issue with other students. Lonning (1993) states that group discussions, involved the group members' participation is much more effective to change the attitudes and behavior of individuals in a

persuasive discourse. So with *Cooperative Learning*, students who are having problems with the lesson can ask questions to the group without any shames, compared if they should ask directly to the teacher. This will enhance the student's motivation to learn in order to gain a better understanding about lesson material which is learned by searching, finding and developing the concept of a group basis. Thus *Cooperative Learning* is established as student-centered learning (*student centered*) and is not centered on the lecturer (*teacher centered*) as an educator.,

**Public Speaking**

Public speaking can be defined as the process of speaking to a group of people with the aim to inform, influence (persuade) and / or entertain the audience. Many people called public speaking as a "presentation". Like all forms of communication, public speaking has some basic elements that parallel with the communication model proposed by Laswell; communicator (speaker), message (content of the presentation), the communicant (listener / audience), medium, and effects (impact on audience presentation). The purpose of public speaking is diverse, ranging from transmitting information, motivating people or just telling a story. Whatever the goal of the speaking is, a good speaker can affect both the thoughts and feelings of the audience. Nowadays, public speaking is very much needed in a variety of contexts, including in leadership, as a motivator, in the context of religious, educational, business, customer service, to the mass communication such as talking on television or radio listeners.

**Peer Assessment**

Assessment is usually done by the lecturer to the students. There are two kinds of assessment; result results and process assessment. Both result and process assessments are conducted in public speaking course. Process is judged the students activity and participation during the discussions in class, whether they engage actively and critically in response to the issue being discussed or just sit passively. Result assessment can be seen from the product achieved or student generated. In this case, the result of the assessment for the course is overall students' presentation and performance on the various topics that they have assigned to design. The assessment of speaking performance is not only done by the lecturers but can also be done by a fellow student, this is called peer



assessment. Peer assessment between students can be done by filling the assessment rubric that has been set by the lecturer, so students will make an assessment based on the assessment guidelines that has been given and explained by the lecturer. This method is considered effective not only for improving student reflection abilities, but also for enhancing students' active and interactive classroom discussion. Students will be easier to provide comments and suggestions about the appearance of the theme, based on the existing assessment. In addition, students will also be more focused and attentive on their friend's performance. By doing this students can take lesson on their friends strength and weaknesses to improve their own performance.

### C. RESEARCH METHODOLOGY

#### 1. The subject of the research

Students of English Department who are taking course *Speaking IV*, *Class A and Class B*, in the 5th semester of the 2011/2012 academic year and 2 Models Lecturer of Speaking Course.

#### 2. Setting of the research

The research is conducted in English Department, Faculty of Teacher Training and Education, Muhammadiyah University Surabaya. The research is done at the odd semester of the academic year 2013/2014.

#### 3. Research Procedure

Instructional systems development method applied in this research is Lesson Study model by Lewis (2012). Implementation of Lesson Study through three stages: plan, do, and see.

#### 4. Data collection Techniques

During the accomplishment of the three stages of the lesson study *plan*, *do* and *see*, the data were

taken through observation and digital recording (audio-visual)

### 5. Research Instruments

Basically, this study is an effort to build collegiality among teachers in transferring knowledge to students through *lesson study* models. However, the impact of the application of the coaching profession is the *lesson study* to the student is the primary focus of research. Thus the research instruments can be divided into:

- a. Observation sheet (Plan, Do, and see)
- b. Recording
- c. Student Questionnaire

### 6. Data Analysis

The data were analyzed descriptively.

## D. RESULTS

### Implementation of Lesson Study In Four Cycle

#### • Cycle I

Before planning the lesson, all members and team leaders discuss the condition of students, availability of means of support, characteristics of the subject teaching and others. After conducting an analysis of the conditions and circumstances we drafted the lesson plan (RPP), starting from setting the competencies, the competence indicators, and learning objectives, selecting methods of approach and appropriate strategies, formulate scenarios or steps - learning step by considering a variety of possible student response as well as alternative assistance provided by the lecturers, preparing equipment and instructional media needed and also the method of evaluation.

During the implementation phase in the cycle of a Do, Model lecturer did not apply the teaching strategies based on the lesson plan that has been agreed previously (stage plan), due to the limited time available. Not all students, only half numbers of the students have the opportunity in presenting the story telling ability. The lecturer has taught the class very well and mastered the lesson being taught, but she was not able to make the students be active in discussion. The lecturer had difficulty in encouraging students to think critically and to comment on the

other students performances presented in front of the class. Students tend to be passive during the discussion. There are only few students who gave criticism or suggestions about the storytelling that brought by their friends. Most of students were being ignorant and busy preparing for each own presentation and did not focus or pay attention to the story telling being presented in front of the class. Although the lecturer has given instruction that students should observe carefully observe their friends' performance, so that they could learn lesson from others.

Having completed the implementation plan and direct observation the lecturers and observers conducted reflection (see). The model Lecturer was given time to convey the impressions and other things regarding her teaching and the application of the lesson plan that had developed before. Then the observers were given the opportunity to provide feedback and suggestions for improvements that need to be done in the next cycle. Critics and suggestions that were delivered by observers during reflection should be based on the analysis of observation during the learning process. From the results of the first cycle of reflection, it can be concluded that the method of presentation of individual students is not efficient to be implemented in the course of speaking the next topic.

- **Cycle II**

Learning from the experience of the first cycle in which students are not very active and interactive in the classroom, then the KBK team began to prepare better lesson plans using cooperative learning and self - assessing, students are given the description of the assessment rubric and course regulations of the performance this time. In the implementation (do), lecturer divided the class into 3 groups and set the position of the letter U in the sitting room. One group consisted of five students and each student was given 3 minutes to present its product. Other students in the group were asked to pay attention and be given time to assess the performance based on the topic (promoting product). The Implementation of open lesson on the second cycle is considered successful in improving the interaction and activity of students in the class. In addition, the time available for 2 credits of courses, which is 2 times 50 minutes was fairly enough in accordance with the teaching and learning process duration. At the end of the lesson lecturer still had time to give

review about students' overall performance in general and then end the lesson very well.

On reflection cycle to 2 is considered effective to enhance students speaking ability and to activate learning. It was also efficient in terms of time. But this method was suitable to be applied to the topic / subject of 'promoting product' in which the level of competence of the lesson was not so difficult and required only a short time for the presentation. Difficulty level of the language used was also quite easy because it used every day language conversation in the classroom.

- **Cycle III**

In this third cycle Plan CBC team planned to use the same method applied to the second cycle. But not all methods could be applied in cycle 2 could be applied in cycle 3, considering the topics that should be presented to students in the third cycle was quite difficult and required more time for individual presentations. So the model lecturer planned not to use cooperative learning, but would still continue to apply the model of peer assessment in the classroom.

In an open lesson of cycle 3 students still showed interactive activity in the classroom, although the cooperative learning method was not used. The Model lecturer has given students motivation before the class began, the lecturer said to the students that students participation during the discussion , include giving critics and asking questions would be awarded with points or score of students participation. So students must be active during the discussion. Students were given assessment rubric as their guidelines to assess students' performance in doing peer assessment. Nevertheless, the class can fulfill the provided time, the topic being presented in this cycle was “becoming motivator”. Each student had presented his/her motivational speech in 10 minutes and followed by interactive discussion with the audiences. Because of the limited time, not all 16 students could do their presentation in one meeting. However students were more active than the previous cycle. Inspirational topics being presented by some students were able to motivate the audience and make them involved directly and emotionally. The peer assessment itself made the students more focus on the presentation and they were not busy preparing their own presentation , since they were busy judging their friends performance based on the assessment rubric, given by the lecturer.

- **Cycle IV**

The fourth topic of speaking IV being observed was 'Political Campaign'. Lecturers planned to use cooperative learning models and peer-assessment. In addition lecturers slightly adapted the system of debate in the parliament. Tailored to the topic of public speaking this time as a political campaign, the lecture tried to create a conducive and critical atmosphere for parliamentary debate. Like in cycle 2, students were divided into 3 major groups and each student from each group was given the opportunity to present their political campaigns in a group. The time given is a maximum of 4 minutes for each speech and debates or 5 minutes for questions and answers (Q & A) in group and 1 minute for peer assessment. So each student had 10 minutes. Since each group consisted of not more than 6 students then the time allocation needed was sufficient for 100 minutes (2 credits)/ meeting. At this cycle, most of the students looked active and critical in debate session. To have an effective and interactive campaign, debate and question and answers session, students need to be given direction of the campaign mechanism in the classroom. The rules and techniques of the campaign and debate were delivered before the class start to create regular and well managed campaign and debate atmosphere. But this session required a large classroom so that the noise of each group debate did not distract the noise of the other group.

#### E. CONCLUSION

Lesson study provides opportunities for Lecturers to examine and observe learning process in the classroom. It also gives students benefit in terms of improving the quality of education in the classroom. The result of this lesson study found that cooperative learning could be the most appropriate method to use in the course of speaking, where students are required to present oral English skills with a predetermined time. Cooperative learning encourages the activity of students in the classroom because they can communicate actively and critically in commenting on their friends' performance. In addition, this method also increases students' confidence, where each is given same opportunity to present themselves

in the classroom. Peer assessment is also considered to be very useful in drawing students focus and attention toward the presentation in class. In addition, by knowing the assessment rubric at the beginning of learning, the students are better prepared and anticipated in designing and developing the material of the presentation based on given topics each week. With the clear assessment rubric, students know what to do and what will be evaluated on their public speaking performance. Finally, cooperative learning and peer-assessment are recommended methods that can be applied in speaking class, which has limited time and large number of students, to enhance students' ability in speaking skills and to activate learning in class.

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## LESSON STUDY: COMPARISON STUDY OF THE GRAPH THEORY LEARNING TOWARD STUDENTS LEARNING OUTCOME

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**Abstract:** Lesson study is collaborative activity lecturers to enhance the quality of learning. In the lesson study activity, lecturers in same concentration collaboratively plan, do and evaluate (see) learning obviously. This research aims to know affectivity of the graph theory learning on lesson study-based by using problem based learning (PBL) approach toward student learning outcome in mathematics education department of Ahmad Dahlan University compared with learning without lesson study-based and PBL. This research is experimental research. The population is students of mathematics education department at 7<sup>th</sup> semester, sample is taken randomly. Method of collecting data is documentation to obtain data of initial capability; test technique is to obtain data of learning outcome. Instrument that used is a test. Instrument test used construct validity test, which was with validated by expert. The result of the research is the graph theory learning on lesson study-based is not more effective than learning without lesson study-based. This case was indicated with obtained  $t_{hitung} = 1.161$  on the significant level 0.05 and degree of freedom 119 and  $t_{table} = -2.2$  such that  $1.161 > -2.2$ . This case may be caused by observer too much in a class so that concentration of students and model lecturer during learning process was disturbed.

**Keywords:** Lesson Study, Comparison Study, Graph Theory

### 1 INTRODUCTION

Mathematics is a science that is considered to be difficult for most people. In mathematics learning at both the elementary education, secondary education and higher education still much an activity learning, reasoning ability and communication skills are still lacking. It is characterized by the lack of mathematics learning outcomes. Based on empirical data of the student learning outcomes against several subjects in mathematics education study program FKIP UAD obtained that student learning outcomes in general is still low. It is characterized by the number of students take remedial at each semester and there are many students who earn a low GPA. Related to the above, an attempt to improve the efficiency and quality of learning is cultivated concentrations increase by mathematics education study program.

Discrete mathematics are compulsory subjects in mathematics education study program is given in semester 7 with 2 credit. This subject is one applied subject that does not require a lot of prerequisites so that it can be classed as an easy subject. Therefore, based on the observation of discrete mathematics learning for several semesters found that this course is in great demand by students of the semester 5. Although relatively easy subject but still found many students who did not pass and take remedial.

Based on these problems, this study is limited to a comparative study of graph theory learning based on lesson study using PBL on student learning outcomes in mathematics education study program Ahmad

Dahlan University in academic year 2013/2014. The purpose of this study was to determine the effectiveness of graph theory learning based on Lesson study using PBL on the students learning outcomes of mathematics education at the University of Ahmad Dahlan with learning-based without lesson study.

Lesson study is a collaboration activity of lecturers to improve the quality of learning. In lesson study activities, all lecturers collaboratively plan, implement and evaluate learning in a real. Lesson Study emerges as one of the alternatives to address the problem of learning practices that have been seen as less effective (Lewis, 2002). The implementation of lesson study in lectures to develop the professionalism of lecturers. This is because the continuous of LS will provide eight opportunities for lecturers (model and observer) which relate closely to the lecturer's professional development, namely (1) determining learning objectives that match the needs of the student, (2) reviewing and enhancing learning that are beneficial to students, (3) deepening the knowledge of the learning material presented by the lecturer, (4) determining the long-term goals to be achieved by students, (5) planning collaborative learning, (6) analyzing both of the learning process and student behavior carefully, (7) developing a reliable knowledge of learning, and (8) reflecting on their learning implementation based on the development of both students and colleagues. There are three phases of the lesson study. They are planning (plan), implementation (do) and reflection (see).

Problem-based learning according to the Vernon and Blake in Sockalingam (2010) propose that PBL is an instructional approach that uses problems as a context for the student to acquire both problem-solving skills and knowledge. Meanwhile, according to Graff and Kolmos (2003) Problem-based learning is an educational approach whereby the problem is the starting point of the learning process. Thus the problem-based learning can be understood as a learning approach that is characterized by the giving of the problems as a stimulus for students to practice critical thinking and problem solving skills. Problems that used can be raised either from students or lecturers.

Problem-based learning was developed based on the concepts proposed by Jerome Bruner. Features according to the problem-based learning according to Arends in Suprijono (2011) that authentic assessment, interdisciplinary focus, authentic investigations, product, collaboration. The characteristics of problem-based learning are: (1) learning begins with a problem, (2) ensure that the problems are related to the student’s real world, (3) organize lessons around each problem, not around each discipline, (4) gives a great responsibility to the learners in forming and running their own learning process directly, (5) use of small groups, and (6) requires learners to demonstrate what they have learned in the form of a product or performance.

According to some experts quoted Sardiman (2012,) about learning definition such as; 1) Cronbach provided a definition: Learning is shown by the change in behaviors as the result of experience, 2) Harold Spears said Learning is to is observed to read, to imitate, to try something themselves, to listen, to follow direction, 3) Geoch said learning is a change in performance as a result of practice. Also according Sardiman (2012) learning is a changing in behavior or appearance, with a series of activities for example by reading, watching, listening, imitating etc. So learning can be understood as a change in the behavior of individuals towards a better life. Sudjana (2005) define student learning outcomes is essentially a change in behavior as a result of learning in a broader sense includes the areas of cognitive, affective, and psychomotor. Dimiyati and Mudjiono (2006) also mentioned learning outcomes are the result of an interaction act of learning and teaching acts. According to Gagne that mathematics learning outcomes are the abilities of the students after he received his math learning experience or it can be said that the results of learning mathematics is a change in behavior in students, who observed and measured in terms of changes in knowledge, behavior, attitudes and skills after studying mathematics. The changes are interpreted as the improvement and development direction is better than ever. Therefore, the results of study can be interpreted as the result of a learning

activity that determines the success of the learning process.

## 2 METHODS

The implementation of lesson study of discrete mathematics subject involved one lecturer as a model and 17 observers. The topic of matterial was graph theory. This type of research is experimental research. Experimental research is research done deliberately to cultivate the emergence of the variables, in this case generated variables that learning through lesson study and learning through lesson study of other variables are discrete math learning outcomes. The study involved two classes: one class of experiments and a control class. Both of these classes have the same relative ability (homogeneous). The design of this study used a posttest-only design control design, can be seen in table 1.

Table 1. experiment design

	Treatment	Student learning outcomes
Eksperimen	X	O <sub>1</sub>
control		O <sub>2</sub>

Remarks:

X : Learning through lesson study  
O<sub>1</sub> : The learning outcomes through lesson study  
O : The learning outcomes without lesson study without

(Sugiyono, 2008)

The population in this research was students at semester VII of mathematics education study program in Ahmad Dahlan University which consisting of 5 classes. In this research, the sampling of the classes are conducted using random sampling techniques, class D as experiment and class C as a control class.

Data collection techniques used test. The data collection instruments used in this research was test of student learning outcomes. Instrument was essay test. The instrument before used validated at first. The purpose of validation was to determine whether the instrument has been qualified to use the research or not.

The data analysis technique was a method used to analyze data obtained through research. Data analysis techniques are: (1) Test Requirements Analysis: Normality with Chi Square test and Fisher's test of homogeneity of the test, (2) Hypothesis Testing with t test.

## 3 RESULTS AND DISCUSSION

Based on calculations of data, the average of student learning outcomes of discrete mathematics

which graph theory topic at class control was 61.715 and 56.448 of experimental class. For more details are presented in table 2 below.

Table 2. Summary Description of Mathematics Learning Outcomes

Variable	Treatment	
	LS	Without LS
Number of student	63	58
Highest score	100	100
Lowest score	0	10
average	61.715	56.448
Deviation standar	28.115	21.603
variance	790.465	466.673

Based on the results of normality test with chi squared test, learning outcomes data from the control class and the experimental class were normally distributed. For more details can be seen in table 3 below.

Table 3. Summary test for normality

Learning outcomes	$\chi^2_{count}$	$\chi^2_{table}$	Conclusion
Control	10.729	12.592	Normal
Eksperiment	2.421	9.488	Normal

Based on the results of homogeneity test with Fisher's exact test was obtained of  $F = 1,694$ ,  $F_{(0.025,62,57)} = 1.676$  and  $F_{(0.975,62,57)} = 0.6$  so that  $1.693 > 1.675$  then  $H_0$  was rejected, so the data were not homogeneous.

Based on table 3 and 4, the analysis of hypothesis testing using t-test with variances not homogeneous. The steps of hypothesis test as follow:

1. Hypothesis

$$H_0 : \mu_1 = \mu_2$$

$$H_1 : \mu_1 < \mu_2$$

2.  $\alpha = 0.05$

3. Test Statistics

$$t_{hit} = \frac{(\bar{x}_1 - \bar{x}_2)}{\sqrt{\left(\frac{S_1^2}{n_1}\right) + \left(\frac{S_2^2}{n_2}\right)}}$$

4. Area of rejection

$$t < -t_{(\alpha, v)} \text{ with}$$

$$v = \frac{(S_1^2/n_1 + S_2^2/n_2)}{\left(\frac{(S_1^2/n_1)^2}{n_1-1} + \frac{(S_2^2/n_2)^2}{n_2-1}\right)}$$

5. Calculation

Based on the results of the data analyze obtained that  $t = 1.161$  and  $t_{(0.05, 11)} = 2.2$  then  $1.161 > -2.2$ , so  $H_0$  was accepted.

Thus learning the lesson study in discrete mathematics learning was no more effective than discrete mathematics learning without learning the lesson study.

#### 4 DISCUSSION

Lesson Study aimed to improve the learning through processes of collaboration among the lecturers. If the quality of learning was better cause the student's understanding of material related to discrete mathematics increased. However, based on the analysis of the data shown that the discrete mathematics learning through lesson study was not more effective than learning without lesson study.

Based on information from several students, during learning students felt strained. This happened because at the time of the lecture, students were observed not only from his teachers but some other lecturers who served as an observer. They sit spread in the classroom. However, because the number of observers was quite a lot, in the classroom during learning process student was shy to ask. There are some observers who talk behind so unsettle the class. This case can disturbing concentration of students. Based on information from the lecturer models, during lectures felt less comfortable because observed by 17 observers. This caused less of the delivery of content. Many students who took discrete mathematics subject was repeaters and they still took field experience practice in the school, so they joined the learning at 2<sup>nd</sup> meeting of LS. This caused there was difference in the level of understanding of the material.

In addition to the above possibilities, the other possibility of discrete mathematics learning using LS ineffective can be identified: 1). Small class which size was 9 x 8 m<sup>2</sup> with a group of 58 students and 17 observers. 2) the seating arrangement was not optimal because there were some empty seats in the classroom. 3) The repeater student has not been entered at 3 first meetings. 4) the role of observer was not maximal.

Another research stated that the learning through LS was not more effective than the learning non-LS was the research conducted by Khasanah, U. et al (2013). With the same conditions, namely the large number of observers, small class sizes with a large number of students, number of students repeater. This is in contrast with studies and theories existing LS in Indonesia, Japan, or any other State which said that learning based LS was better. (Sanders, 2009). Therefore, the implementation of LS in the mathematics education study program of UAD need to be evaluated.

#### 3 CONCLUSION

Based on the wording that has been described above it can be concluded that discrete mathematics learning using PBL in lesson study activities are no more effective than discrete mathematics without

learning the lesson study activities. Some of the factors that lead-based learning activities suboptimal lesson study is the role of the observer is not optimal, the number of many observers, the size of the room and the seating arrangement of the students.

#### 4 ACKNOWLEDGEMENTS

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## COMBINATION OF PROBLEM-BASED LEARNING AND LOVE IMPLEMENTATION IN LESSON STUDY ACTIVITY TO IMPROVE STUDENTS’ LEARNING RESULT

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**Abstract:** An effective attempt to improve learning quality is creating good and solid learning community which is also willing to do continuous improvement. This attempt is implemented in lesson study, which covers three main activities, i.e. plan, do and see. The lesson study involves all lecturers belong to the same subject group to work collaboratively based on mutual learning. It has been discovered a root problem of students’ learning in animal physiology I course which required prioritized solution. This problem was the students’ learning achievement in cognitive domain. Learning strategy implemented in this lesson study activity was problem-based learning (PBL) combined with LOVE (*Lembar Observasi Video/Video Observation Sheet*). This approach aimed to improve students’ learning result. Four cycles of lesson study activities was conducted in animal physiology I course in Biology Department, Faculty of Teacher Training and Education, Universitas Ahmad Dahlan, Yogyakarta. The implementation of this lesson study involved a lecturer as a model with 9 observers and 48 students in a class, on March-April, academic year 2012/2013. Data showed that implementation of PBL combined with LOVE improved students’ learning result with the average score of 48,64; 52; 71,9 and 71,7 in each cycle respectively.

**Keywords:** problem-based learning, love, lesson study, learning result

### 1 INTRODUCTION

Biology Education Department in Faculty of Teacher Training and Education, Universitas Ahmad Dahlan is one of the Teacher Training Institution that has responsibility for educating professional biology teacher candidates. The major challenge for biology education department was to improve students’ knowledge, competences and skills to comply with national education system. Curriculum analysis was continuously implemented to evaluate the needs of external stakeholders, which includes the Senior High Schools. Teacher candidates have always been familiarized with schools’ curriculum to better understand the dynamic requirements of those schools. Knowledge and skills are major consideration to be continuously improved. In order to conduct the improvement in learning process, lesson study has been implemented.

In lesson study, lecturers belong to the same group evaluated the learning process in the class collaboratively. This activity was based on collegiality and mutual learning principles among the lecturers themselves to create learning community. Lesson study also serves as a tool to aid lecturers in creating high quality of lesson plan as well as a guidance to implement this lesson plan in the class. Lewis et al.

(2006) stated that teachers or lecturers should produce high quality of lesson plan, observe and analyze the actual learning experienced in the class. In that way, teachers will make better implication for the learning design and actual learning process continuously.

Teachers in Japan have implemented lesson study model for decades to evaluate how they manage learning design in the class. Furthermore, teachers in United States of America also found the fact that students’ good score in mathematics subject was related with lesson study that has been implemented previously (Lenski & Caskey, 2009). As reported by Lewis et al. (2006) Lesson study implementation in USA has been the fastest-growing model of teacher professionalism development program. Since 2000, many elementary schools have developed lesson study model for their teachers. This approach helped teachers to create learning community in planning and implementing the lesson plan for their students.

Animal Physiology I is one of the core courses for 4<sup>th</sup> semester students of biology education department. This course is a pre-requisite for animal physiology II which is offered in 5<sup>th</sup> semester. Basic competence for this course is to understand physiology concepts in animal’s system and correlation between each system and its application in the real life. Based on the basic competence

formulation, characteristic of this course is in cognitive level C2 and C3 dominantly. However, high order thinking skills have always been a consideration in the learning process.

It has been identified the root problem of students' learning in animal physiology 1 course was learning achievement in cognitive domain. Learning result of this course in the past depicted the students had problem in understanding basic concept and theories of the topic. The difficulties were in extracting information from the textbook or any other learning source which described the topic. Several indicators had been observed to support this conclusion. They were the student's ability to rewrite the concept that has been previously explained was inaccurate, the student's ability to answer short question regarding the concept was low, and the student's presentation of the concepts before their friends was also incorrect. Eventually, their achievements in mid semester examination and or final examination were unsatisfied. However, during the course, some students have shown their best effort to understand the materials by any means, including intensive discussion within student's group. This condition was also observed and considered as the potential answer on the root problem.

Lecturer group discussion as part of the lesson study activity found that Problem-based Learning (PBL) has been considered as a successful and innovative method to assist students in their learning process. This model has opened a new engineering education in accordance with many other learning models with the objective to improve learning quality. Many efforts have been done to clearly define the concept 'problem-based learning'. Howard Barrows, one of the person involved in the development of this model at Mc Master University, Canada, explained the concept in terms of specific attributes as being student-centered, taking place in small groups with the teacher acting as facilitator and being organized around problems (Barrows, 1984 in De Graaff and Kolmos, 2003).

Furthermore, as explained by Hmelo-Silver (2004) that problem-based approach to learning asks the student to experience problem solving so they can learn both content and thinking strategies. PBL is an instructional method in which students learn through facilitated problem solving. They learn complex problem that sometimes does not have single correct answer. They also need to work in group collaboratively to identify what they need to learn in order to solve the problem. Students are engaged in self-directed learning (SDL) and then apply their new knowledge on the problem and the effectiveness of the strategies employed. Teachers role in this method are as facilitator rather than providing knowledge directly to the students.

Ernst & Colthorpe (2008) explained that learning is an active process which involves all learners in many activities to enable them explore and

discover ideas to solve the problems. In this case, problem-based learning approach plays its role in the learning process where learners are exposed to the problem first so they would learn to find to solution.

This kind of active learning was proved to be effective in biology learning process as reported previously (Udovic et al., 2002) to develop students' comprehension on essential biology concepts as well as improve scientific discoveries and critical thinking skills.

In addition, students also needed to improve their understanding on the topic. Due to characteristic of animal physiology course which contains many definition and mechanisms of animal system organs, a full pictures and diagrams explanation solely was not sufficient. At this point, video played important role in complementing learning media for the students. As a treatment to encourage students in extracting information regarding the topic independently, student worksheets were given. This worksheet required students to observe video related to the topic to enhance their understanding on the concept. This worksheet was specially named LOVE (Lembar Observasi Video/ Video Observation Sheet). Implementation of PBL combined with LOVE in lesson study activity on animal physiology 1 course was expected to improve students' learning result.

## 2 METHODS

Basically, lesson study was conducted in three main activities, i.e. plan, do, and see (reflection). Several previous studies have described the practice of those activities in the class which involves the teachers or lecturers belong to a group. Nahadi (2007) reported the implementation of school-based lesson study with one teacher as a model accompanied by the other teachers in collaboration with lecturers who served as observers. Similar study has also been conducted by Sriyati (2007) who involved high school teachers to be observers in the lesson study activities in accordance with the implementation of classroom action research.

In this study, lesson study activities to improve students' learning result on animal physiology 1 course was conducted in Class B of 2<sup>nd</sup> year (4<sup>th</sup> semester) student academic year 2012/2013 with the total number of students was 48. There were one lecturer appointed as a model, 8 observers and one cameraman/photographer to record the whole activities in lesson study. Implementation of the lesson study was from March 11, 2013 to April 3, 2013 divided into 4 cycles of *plan*, *do* and *see* activities. In plan session, all lecturers involved tried to identify the learning problem. They also designed the lesson plan, student worksheet and observation sheet afterward. The observation sheet was used to collect data regarding the student activities during the lesson. In

addition, all student progress and their achievements were also recorded to be analyzed.

The next step was *do*, which means the implementation of lesson study in the class. Also known as open class, a lecturer appointed as model conducted the learning process in the class while at the same time the observers observed the students activities during the lesson. In this session, the role of cameraman/photographer was very important in capturing anything happened in the class as an evident of students responses to the learning model implemented by lecturer.

After the class was over, all observers, a model and cameraman assembled together in lecturer’s room to discuss whatever happened during the open class. This session is known as ‘see’ or reflection. A model was given the first opportunity to express his feeling and thoughts regarding the learning model that had just been implemented previously. The observers gave their opinions and facts they found regarding the student responses, supported by the data they wrote on observation sheets and the video recorded in the class. The discussion in this session produced suggestions for the improvement in learning process on the next cycle.

In this paper, all data were obtained from post-test on each cycle. The test was conducted after the student presentation session so all materials had been delivered and discussed previously within the groups of the students. In order to objectively assess student’s comprehension on the topic, all tests were designed as short essays. The Minimum Completeness Criteria (MCC) was defined at score 70. This was based on the average students score on animal physiology I course in the previous year. The MCC described the student ability to fulfill the basic competences on the course.

On the other hand, observation sheet filled by all observers were also taken into consideration. This described the student responses during the learning model implementation in the class. All observer suggestions were also considered carefully to support the problem solving in animal physiology I course. The data were then analyzed using quantitative description.

### 3 Results and Discussion

Four cycles of lesson study activities which cover plan, do and see have been conducted. The implementation of Problem-based Learning (PBL) in combination with LOVE (Lembar observasi Video/Video Observation Sheet) have shown an increase both in student learning results and the number of student who pass Minimum Completeness Criteria (MMC) as seen in Figure 1.

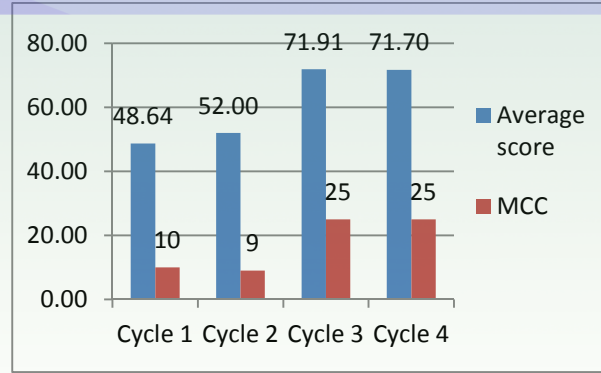


Figure 1. Post-test average score and number of student passing minimum completeness criteria (MCC) on each cycle during lesson study activities in animal physiology 1 course.

Overall, there was an increase in the score average of the students in animal physiology 1 course of 48,64; 52; 71,91; and 71,70 in cycle 1 to cycle 4, respectively. There was also an increase of student number who passed MCC from 10 students in cycle 1 to 25 students in cycle 4.

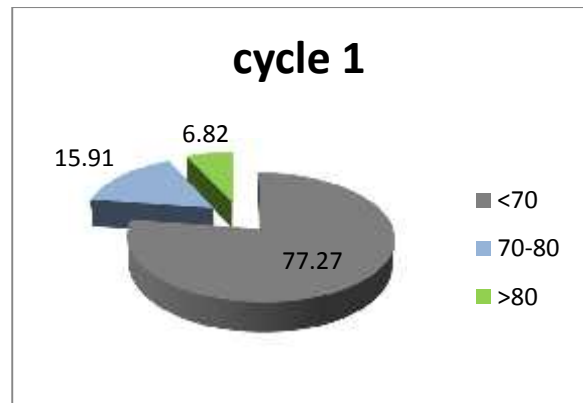


Figure 2. Students score proportion (%) in cycle 1 of lesson study activity.

Post-test average score obtained by students in cycle 1 was the lowest (48,64) with only 10 students pass MCC. This reflected the general capability of the students to understand the materials was low.

In fig.2, score proportion showed that more than 77 percent of the students have not passed the MCC which was set at score 70. Only 15,91 percent of the students got average score in range of 70-80, while only approximately 6 percent of the students had the highest average score of more than 80.

Topic delivered in cycle 1 was about human digestive system. Based on the lecturers discussion in plan activity, it was decided to give the student general overview of the material first, followed by distributing students worksheets to each group. Focus group discussion (FGD) was undergone intensively under the supervision of lecturer. In this session lecturer acted as facilitator to guide the students working on

their assignments. Video material contained brief explanation of the topic was also distributed to each group to help the students answering related questions in their worksheets. It was observed clearly that students' response to this approach was not very satisfied. They seemed to be unfamiliar to learn in such environment that required them to extract information from many learning sources and then discussed it in the group. Conventional learning model that was usually conducted in the class made the students acted passively. This contributed to the lowest achievements of the average scores and number of students achieving MCC in the first cycle.

Reflection discussion on the first cycle found that this approach should be continued in the next cycle. What needed to be improved was the general explanation from the lecturer which should cover details on the topic prior to ask the students extracting information from the video. Post-test was also needed to be more specific to the topic so that students would have less difficult in answering the questions.

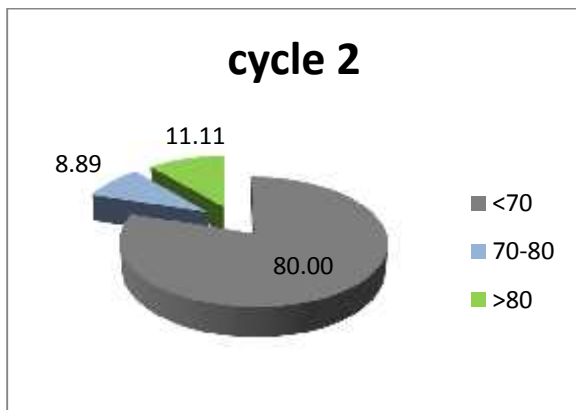


Figure 3. Students score proportion (%) in cycle 2 of lesson study activity.

The second cycle showed an increase in the post-test average score. This depicted that students understanding to the topic was generally improved. They started to be familiar with the PBL approach in learning process. In this way, PBL could serve as an advancement tool in learning as previously reported by Hillman (2003). Video materials were also helpful in supporting the students' comprehension on the topic. However, the student number passing MCC was slightly decline to 9 from 10 in the previous cycle. Only 20 percent of the students completely fulfill the basic competence of the course (fig. 3). Despite the decline, there was an increase in the percentage of the students obtained the highest average score of more than 80. Topic of this session was about human respiratory mechanism. Complexity of the topic could also contribute to the students difficulties in understanding it.

Reflection discussion of the lecturer and observers recommended the use of more diagram and pictures to assist the students. It was concluded that in explaining mechanisms, video played important role to enhance students' comprehension. Therefore, the next cycle should also deliver the material in the form of video. The LOVE worksheet also described the students' improvement in extracting concepts and theories of the topic more accurately. A group of students was also identified as having difficulties more than any other group. This group showed sluggishness in the process. It turned out the member of this group was the repeater students, who did not successfully pass this course last year. This group needed more concern and guidance from the lecturer that served as facilitator.

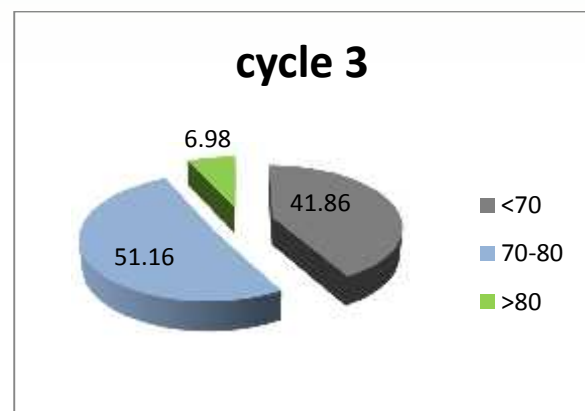


Figure 4. Students score proportion (%) in cycle 3 of lesson study activity.

In cycle 3, as depicted from fig. 1 and 4, students average score reached the highest point at 71,91. Number of students achieved MMC also increased sharply from 9 in cycle 2 to 25 in cycle 3. Students' score proportion described the number of students passed MMC was almost 60 percent compared to the previous cycle which was only 20 percent.

Implementation of PBL seemed to increase not only students' comprehension on the materials, but also the students' independence in learning process. They were no longer entirely depended on lecturer, instead, they experienced the way of extracting information directly from various learning sources, including video. They were also trained on how to express the ideas in the group and combining the concepts they found to understand the topic. At the end of FGD, a representative of each group presented the concept before his/her friends in order to get feedback. This session was also useful for the lecturer to monitor the students' comprehension and to make any revision when misconception occurred. In this cycle, students seemed to be more prepared in discussing the materials with group members. Topic delivered in this cycle was still about respiratory



system, with subtopic lung volume and respiratory regulation. The problem in the worksheet was related to the daily life. In this case, students could get real example of the topic to support their comprehension. There were no substantial misconception or difficulties experienced by the students suggested that this cycle was better than the previous cycles.

PBL approach was helpful for the students in their learning process. However, when setting the students on a problem solving course, they don't know what to do at first. In this case, lecturer needs to provide facilities so they can find out information to solve the problems (Johnston, 1997 in Hillman, 2003). Video served as the best facility to support the explanation of mechanisms or process rather than just images or pictures alone. The video observation sheet (LOVE) was proved to assist students in understanding the topic.

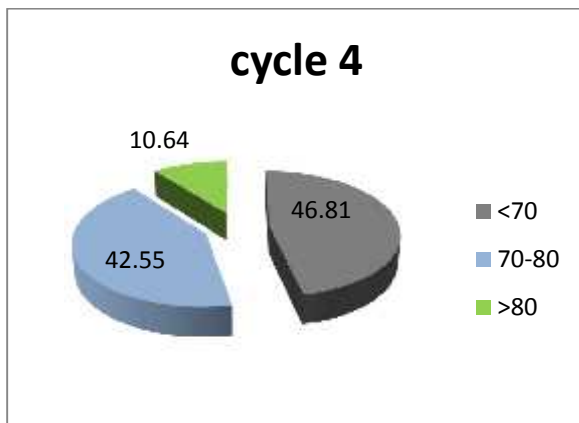


Figure 5. Students score proportion (%) in cycle 4 of lesson study activity.

The fourth cycle of lesson study activity was conducted in the topic cardiovascular physiology. This topic was known to be intricate due to many concepts that required detail observation and thinking from the students. The use of video in explaining the cardio cycle was very substantial. It was found that students' post-test average score was slightly reduced compare to the third cycle (fig. 1). However, the number of students passed MCC was equal to the previous cycle. Score proportion (fig. 5) depicted the increase number of students who obtained the score above 80. The students' number percentage in cycle 4 was decrease in MCC compared to cycle 3 due to the unequal number of total students' presence in those cycles. In last cycle, there were 47 students compared to 43 in third cycle.

In the reflection session, all lecturers evaluated the PBL implementation with the use of LOVE to assist the students achieving the best result. They concluded this approach was significant in improving students' learning result. In accordance to this conclusion, Hmelo-silver (2004) explained that as

a matter of fact, PBL can help students develop: flexible knowledge, effective problem-solving skills, self-directed learning skills, effective collaboration skills, and intrinsic motivation.

In order the students to be successfully learn in PBL environment, there are 7 steps that were suggested, i.e.:

1. Students need to clarify the concepts
2. Students need to define the problem clearly
3. Students analysis on the problem
4. Students find the explanation
5. Students formulation of the learning objective
6. Students need to search further information
7. Students need to report and test new information accurately.

Eventually, using PBL, students become lifelong learners who have learned to take responsibility for their own learning process (De graaf and Kolmos, 2003).

In addition to that, determining MCC should be more comprehensive to get the most objective point. Nasirullah (2013) stated that deciding the MCC was complex. Many things should be taken into considerations, such as complexity of the course, facilities that support the learning process and the individual capability of the student. In this case, through lesson study, lecturers have the opportunity to learn and discuss more about setting up the MCC objectively.

At the end, lesson study activity was a significant attempt not only to improve professionalism of lecturers, but also to increase the students' learning quality. As previously explained by Lenski and Caskey (2009), lesson study activity was very helpful to improve lecturers'/teacher's professionalism by constructing, organizing, sharing, and sharpening their knowledge in learning process. Therefore, plan, do and see need to be implemented appropriately to solve students' learning problems and at the same time, help them achieving the expected competences.

## 4 CONCLUSIONS

Combination of PBL with LOVE implemented in lesson study activity improved the students' learning result. PBL approach in learning has opened up students' mind to significantly develop their knowledge, self-directed learning skill, collaboration skill and also problem-solving skill that made them a lifelong learners. Moreover, lecturers' professionalism through working collaboratively in plan, do and see activities was also improved. In lesson study, there was wide opportunity for the lecturers to develop skills in planning, implementing

and evaluating the learning strategies to improve learning quality.

## 5 ACKNOWLEDGEMENTS

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## Lesson Study Makes Contextual Learning More Directed in English Learning for 4<sup>th</sup> Graders in SD GagasCeria

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**Abstract:** Contextual learning is a learning that associates contents with students' daily life. It is also the characteristic of learning in SD GagasCeria. Teachers give the experiences to the students so that the lessons become meaningful. Lesson study is one of the learning tools for the teachers which one of its aims is to improve learning quality. In SD GagasCeria , Lesson study already done since 2009 and it affects the contextual learning in SD GagasCeria. Through Lesson study, the contextual learning develops. Learning in the class more directed then before. In lesson study process, teachers design the lesson together. Here, discussion processes which make learning idea more creative begin. The lesson focus is not only for the teachers but also for the students and the contents. In English lesson in grade 4 of SD GagasCeria , contextual learning already done. For instance, when we learned about "hobbies" we made the activity in a theme called "Gagas Got Talent". In this theme students learned many kinds of hobbies. At the end of the theme, they had to present their hobby in the audition called Gagas Got Talent. In the Gagas Got Talent lesson planning, English teachers and I discussed many kinds of activities which could make students more enthusiastic and active in the class. We discussed about the activities, contents and also about the materials that will be used. However the thing that made the lesson more directed is not only the plan but also the discussion after the lesson. It is called post lesson discussion. It gave many influences for the lesson. Through post lesson discussion, we found that learning stages take important role so that students can understand the contents. Learning stages about hobbies became clearer and more directed. Students were able to reach the learning goal nicely with the exciting process as well

### 1. INTRODUCTION

Contextual learning is the characteristic learning in SD GagasCeria. Teachers give the experiences to the students so that the lessons become meaningful.

As defined by Elaine Johnson in her book *Contextual Teaching and Learning*, contextual teaching and learning (CTL) is "a system of instruction based on the philosophy that students learn when they see meaning in academic material, and they see meaning in schoolwork when they can connect new information with prior knowledge and their own experience" (Johnson, 2002. p. vii).

In other words, contextual learning helps the student to see the meaning of material by connecting it with their personal knowledge, experiences and interest so that the children will feel easy to recognize and learn the subject. It also happens in the lesson of SD GagasCeria.

Apparently, in English learning for 4 grade of SD gagasCeria, contextual learning become more directed through lesson study.

Ozawa (2009) said that lesson study is a teacher's activity to increase their lesson through their collaboration. Lesson study is a cycle that involves plan, do and see. With the teachers

collaboration in planning, doing and reflection so that the contextual learning will be more directed. Through planning and reflection process, the teachers can discuss the stages of the lesson.

Through Lesson study, the contextual learning develops. Learning in the class more directed then before. In lesson study process, teachers design the lesson together. Here, discussion processes which make learning stages become directed begin. Beside that through the discussion there will be a lot of creative idea appear for the lesson. The lesson focus is not only for the teachers but also for the students and the contents.

In English lesson of 4th grade in SD GagasCeria, contextual learning has been done. We bind up the lesson with the theme that makes children interested to learn. Then through lesson study we indicate that English lesson become more directed than before.

### Content

#### 1. The aim

The aim of this article is to indicate that lesson study can make contextual learning in English learning of 4 grade in SD GagasCeria become more directed.

## 2. Design/ Methodology/ Approach

The report from the process of lesson study taken from the answers that were given to the students before and after lesson study.

## 3. Findings

The learning subject is “hobby” and it is familiar for the students. Before the lesson done in a theme (conventional learning), students only can answer the question with the short answer. After the lesson done by the contextual learning with also the lesson study, students seem enthusiastic to learn and they not only can answer the question but they can explain it as well.

**4. Originality/ value :** Data from the answers of the students

**5. Keywords :** Contextual learning and lesson study.

## 2 LITERARY REVIEW

### 2.1 Contextual learning

Contextual teaching and learning (CTL) is “a system of instruction based on the philosophy that students learn when they see meaning in academic material, and they see meaning in schoolwork when they can connect new information with prior knowledge and their own experience” (Johnson, 2002. p. vii).

### 2.2 Lesson study

Ozawa (2009) said that lesson study is a teacher’s activity to increase their lesson through their collaboration. Lesson study is a cycle that involves plan, do and see. With the teachers’ collaboration in planning, doing and reflection so that the contextual learning will be more directed. Through planning and reflection process, the teachers can discuss the stages of the lesson.

Lesson Study has been implemented by the Japanese education system since 1900’s. However, Stigler and Hiebert described Lesson Study extensively in 1999 in their book “The Teaching Gap” (Hock & Sam, 2010). Lesson Study is an approach used to conduct the research on teaching in the classroom. This approach is able to explore the development of more meaningful teaching because it emphasizes the teaching process. The exploration of the teaching process is in the form of inquiry investigation (Chassels & Melville, 2009) and systematically through the observation of teaching (Fernandez, 2002).

Lesson Study is a continuation of collaborative teaching methods and has its own characteristics

(Daipi, 2009). Lesson Study can enhance teachers’ learning experience as well as improve their teaching. Teacher learning experiences include teachers’ knowledge of the content of the lesson (content knowledge) and knowledge of teaching methods (pedagogical knowledge), which should be built and derived from observation and reflection activities of teaching practices (Dotger et al., 2012; Lewis, 2008; Post & Varoz, 2008). It also does not marginalize the importance of students’ learning in the teaching process. The evaluation and reflection of each lesson is not only on teachers but also focuses on the development of student learning. Teachers observe learning ability and intelligence of students (Cheng & Yee, 2012; Lewis, 2008).

This helps teachers plan lessons carefully and meet the students’ needs. In addition, the Lesson Study approach enhance creativity and critical thinking of trainee teachers (Ong et al., 2010), particularly when analyzing in-depth lessons, stimulating innovation, and reforming teaching and learning to find solutions to a problem and to expand understanding skills as well as the ability of teachers and students. Lesson Study can be implemented in various ways to suit the teachers, students, and the environment while meeting the criteria in Lesson Study cycle, as shown in Figure 1.

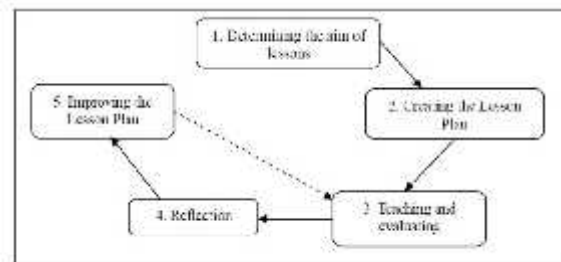


Figure 2. Cycle of lesson study

Lesson Study implementation involves several teachers teaching sessions. Uniquely, the teachers work together to determine the objective of each teaching session. The first step in the Lesson Study involves teachers’ discussion to determine appropriate learning objectives with targeted students. The teaching objective should be reasonable as students need to understand the concept and teach effectively. In the second step, teachers are asked to build a complete Lesson Plan for teaching together (Lewis, 2008; Post & Varoz, 2008; Teacher Education Division of the Ministry of Education, 2011) based on long-term judgments about student learning. Lesson Plan contains detailed information about different aspects of each lesson to be carried out (Fernandez, 2002).

Cooperation in the preparation of this Lesson Plan is expected to generate more thoughtful ideas. In the third step, a teacher will implement teaching in a simulation classroom based on the proposed

Lesson Plan. Another teacher will monitor and evaluate the teaching (Lewis, 2008; Post & Varoz, 2008). Both are expected to understand the subject matter taught, as they will develop a Lesson Plan.

Therefore, the observation of the students responses is based on observations protocol then the results is recorded (Fernandez & Robinson, 2006). Deep observations will provide detailed feedback to stimulate the teacher to understand their students' learning better (Cheng & Yee, 2012). After completing the lesson, the teacher will reflect on the teaching and learning and discuss the strengths and weaknesses of teaching during the process of teaching (Teacher Education Division of the Ministry of Education, 2011).

As such, the Lesson Plan can be improved based on the reflections, which can be used to identify weaknesses in the operation of learning (Marble, 2007). Next, the second lesson can follow the improved Lesson Plans. Indeed, during the second lesson, the teacher can try to modify the thoughts of students who previously adopted the wrong concept of learning (Cheng & Yee, 2012).

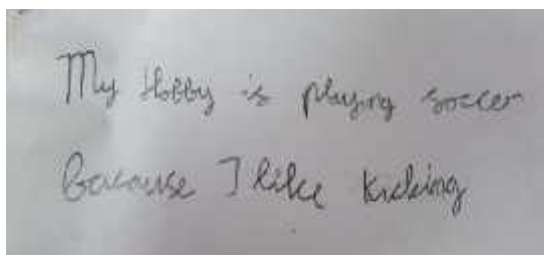
### 3 RESULT

We did the research in English of 4 graders in SD GagasCeria with "hobby" as the material.

Before using the theme, I did the conventional lesson. I discussed with the children about the hobbies in the class. In the class discussion, I asked several questions to the children. They are :

1. What is your hobby?
2. Why do you like it?
3. Where do you usually do it?
4. How do you do/play it?

From the questions above, students only could answer 2 questions. They are 'What' and "why" questions. This is one of the example of the student answer before lesson study.



This is belong to Bema, one of the 4 grade students. When I asked about hobby as we can see above, he only could answer "My hobby is playing soccer because I like kicking".

After that, we began the lesson study. In lesson study, we did three things, plan do and see as can we see in this table below.

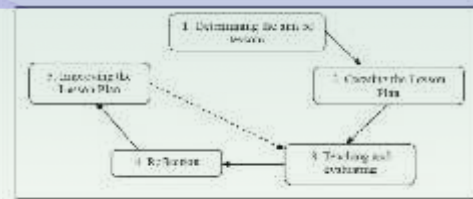


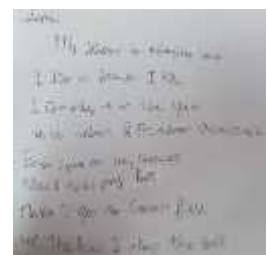
Figure 2. Cycle of lesson study

First we did the plan. In this activity we discussed the preparation and also discussed about the lesson. If we see from the table, plan including determine the aim of lesson and creating the lesson. We determined the aim of the lesson together. The aim of the lesson was the audition. So that at the end of the lesson they have to do demonstrate, describe and write (DDW) their hobby. We created the lesson became the audition called "Gagas Got Talent". We used this as the theme because, we were inspired one of the TV program and students seem interest with this program. They talked a lot about this program. In doing the plan, we also prepared the materials such as video and slide.

After that, we did the second activity. I taught and other teachers observed my lesson. Here we did teaching and then evaluating. We did evaluating after I finished with the class.

In evaluating process, we discussed students response, activity and the lesson itself whether student could understand the lesson or not. Beside that in this process we also discussed about the next stages of lesson or how the students can reach the aims of the lesson. Here I see that the contextual learning began to be directed through the discussion. In order to the students can reach the lesson aim so that we made the check point for each lesson.

Then after we do the lesson study and started to apply the reflection result. Here are one of student's articles.



From the picture above we can see that Bema can answer the question completely. When I ask him, he explained the answer:

" my hobby is playing soccer. I like it because I like sport. I can play it in the yard. It is indoor and outdoor activity. First I put on my costume, then I take my ball, next I go to soccer field and the last I play the ball."

#### 4 CONCLUSION

1. Contextual learning is the characteristic learning in SD GagasCeria. Teachers connect the material with students interest or student daily life so the students will feel enthusiastic to learn.
2. Lesson study makes contextual learning more directed. Through the activity of lesson study learning stages directed in collaboration of the teachers in a team.
3. English lesson in 4 grade of SD GagasCeria also use the contextual learning method. Through English lesson this research indicates that contextual learning can be more directed through lesson study.
4. Students already know the material. It relates with their interest. It is about hobby.
5. Before the lesson done by a theme, students learning outcomes were no so good. From 4 questions, they only can answer two questions with the short answers.
6. After the lesson bind with a theme, students became enthusiastic to learn. Beside that their learning outcomes are better than before. They do not only can answer the questions but also can explain the answer as well.

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## Enhancement Learning Activities and Students Understanding by Way of Lesson Study in Taxonomy of Vascular Plants at Biology Education Department Universitas Muhammadiyah Bengkulu

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**Abstract:** The Purpose of this research is to determine whether there is an increasing in the activity of learning and Student understanding by lesson study in Taxonomy of Vascular Plants course at Biology Education Department Universitas Muhammadiyah Bengkulu. Lectures by applying lesson study, namely : *plan, do, and see*. It has been conducted as much as 4 times open lesson at the class. Data are collected by observation paper and test. Results of this research show that the improvement Student learning activity is occurred from open lesson 1 to open lesson 4. Student learning Comprehension in Taxonomy of Vascular Plants increase, namely from open lesson 1 to open lesson 4 the average is 61.43 , 67.03 , 71.03 , 76.37 consecutively.

**Keywords:** Lesson Study, Learning activity, Comprehension, Taxonomy of Vascular Plants

### FOREWORD

#### Background

Student tend to assume that study in college to get much lecturing material and high score. The essence of learning in university is to build mindset and cognitive structure and develop thinking skill which has been ignored, whereas by thinking skills, student is expected to integrate their knowledges and experiences to solve the problem facing on study and life problem generally (Nurhayati, 2011)

This is due to, one of them is the weakness problem on learning process, especially on Science study, is more teacher-centered (Lecturer only gives science as product and students memorize factual information) (Depdiknas, 2008). Learning has been less innovative so far and less encouraging students to build competition desire. Most of Learning is conducting only by giving lecture.

Innovation has been done is only limited on using media, namely sometimes using LCD to show presentation on power point. This is still teacher centered (Sugiharto, 2011). One of learning which can improve a learning process is by problem oriented learning, because problem oriented learning opinion from Ibrahim and Nur (2000:2) is trying to help students become independents and autonomous.

One way to help lecturer so that they can improve their skill in lecture activity is by Lesson Study activity. Lesson study can provide sharing experience among lecturers in order to create a learning community that is programmed. With

lesson study activity assesment of colaborative learning and sustainable based on the principles of collegiality and mutual learning can build learning community, performance of the student in learning is the most important part in learning process, interaction among students, students and their lectures, students and their study material, and students and their environment, are concern matters. On reflection stage (see) lecturer obtain inputs from various competent side, about learning which is directed on how student learns. Therefore, it is possible to improve the quality of learning.

Spermatophyte Systematic course is a group course on group expertise course which is taught on odd semester at Biology Education department Universitas Muhammadiyah Bengkulu. In this course, student is still difficult to understand the systematics content consequently the interest of students are less interested in the subject of systematic.

#### Research Questions

This research question is whether the adoption of Proble Based Learning (PBL) through lesson study activity on Spermatophyte course can increase activity and learning outcomes of student in Biologi education Faculty, Universitas Muhammadiyah Bengkulu?

#### Relevant Research

Research result by Yeni (2012) states that PBL model is better than conventional model and has effect on improving student learning outcomes. Happy N (2011), also stated the implementation of

can enhance the ability of students to think critically and creatively. According to Nopriyeni (2013) stated that there are difference in creative thinking ability of students using PBL learning model, inquiry and conventional. According to Mas'ud (2012) through his research stated that PPL Model lesson study based can enhance the activity, understanding, as well as student motivation in carrying out the teaching and learning process in the classroom. (Mas'ud, 2012) another research result show that there are differences in critical thinking ability of students through PBL learning, GI and conventional, with the highest critical thinking skills acquired through PBL (Apriza, 2013)

**Study of Theory**

**Problems based learning in Spermatophyte systematic course**

Problems based learning (PBL), is one of innovative learning model which can provide an active learning conditions for students. PBL is learning model that involves students to solve a problem through the stages of scientific methods so that students can learn knowledge related to its problem and also have skills to solve the problem. (Ward, 2002; Stepien, dkk, 1993 inside Dasna & Sutrisno, 2010).

According to Arends (1997) problem based learning model is very useful to develop thinking level higher in problem oriented situations, including how a good learning is. In order for a teaching is meaningful, teacher can help the students to learn on solving the problem by giving related tasks with real life, improve process skills to solve problems, and train students to be independent as an autonomous learner.

The role of lecturer in problem based teaching is to present a problem, ask questions and provide the necessary student facilities. Broadly speaking problem based teaching consists of presenting to students the authentic problem situations and meaningful problem that can make it easier for them to conduct an investigation and inquiry.

Table 1 Stages of problem based learning

Stages	Lecturer Behaviour
Stage 1 : Student orientation to the problem	Lecturer explained the purpose of learning, motivate students to engage in problem solving activities chosen.
Stage 2 : Organizing students to learn	Lecturer helps student to define and organize study task related to the problem.

Stage 3 : Guiding the investigation of individual and group	Lecturer encourages students to collect appropriate information, carry out experiments, to get an explanation and problem solving.
Stage 4 : Developing and presenting the work	Lecturers help students to plan and prepare appropriate work such as reports, videos, and models as well as helping them to share the tasks with their friends.
Stage 5 : Analyze and evaluate the problem solving process	Lecturers help student to reflect or evaluate on their investigation and the processes used.

**Implementation of lesson study activity systematic study of spermatophyte.**

Lesson study activity through open lesson and reflection in lecture of Spermatophyte systematic course in Biology education department Universitas Muhammadiyah Bengkulu which includes 3 steps : Planning, do (implementation), and see (reflection) in learning at real classroom during 4 open lesson that has been conducted in October-Novembre 2013. Open lesson is done by 3 step, namely : planning, do (implementation), and see (reflection) with details of the activities for each stage as follows :

(1) Planning

In planning stage, the things are done is as follows :

- a. Analyzing the teaching materials which include : the depth of the material, compliance with demands of curriculum and degree of difficulty.
- b. Determining of learning strategy, such as :
  - b.1 foreward: Motivating students
  - b.2 Core Activity
    - Expected study activity
    - Design student interaction with learning materials
    - Design student interaction with student
    - Design interaction student with lecturer
  - b.3 closing
    - Determining student activity which is expected to conclude the lessons
- c. Creating a learning device
  - c.1 Chapter Design
  - c.2 Lesson Design





- c.3 Student worksheet
  - c.4 Assessment
  - d. Determining observer
    - d.1 Chairman of the program
    - d.2 Lecturer appropriate field
  - e. Determining Lecturers models who will implement the learning in the classroom.
- (2) Do (implentation)
- Do steps is done include the following stages :
- a. Brief meeting (briefing) guided by facilitator in this case Biology education program chairman.
  - b. Lecturer models suggests short plan (lesson plans,objectives,position of teaching materials in the curriculum,the prediction of student response.
  - c. The facilitator reminds the observer to not intervene in the learning process
  - d. Observer may choose a strategic place in accordance with observations plan.
  - e. Lecturer model implements the learning process
- (3) See (reflection)
- On see or reflection stage,the activities done as follows :
- a. Facilitator presents the agenda of reflection.
  - b. Facilitator presents the rules
    - b.1 speak orderly ( be a good listener)
    - b.2 speak politely which is constructive not to prosecute lecturer model
  - c. Each participant was given a chance to speak,speak based on findings observatios.
  - d. 4 inputs is to be focus on " how students learn"
  - e. Lecturer Model presents :
    - e.1 condition are not appropriate and in line with expectations.
    - e.2 Something that changed from planned.
  - f. facilitator gives observer a chance to comment
  - g. Facilitator lets the "notulen" to summarize the discussion
  - h. Facilitattor says at thank and announce the next lesson study activities.

### The Experience that has been done

As chairman grant of higher education lesson study 2013-2014 in Education department Universitas Muhammadiyah Bengkulu,has conducted mortality research of lesson study Biology education programe Universitas

Muhammadiyah Bengkulu. On odd semester 2013/2014 is done 2 groups course of lesson study research,namely plant physiology course and vertebrate systematic. On even semester 2013/2014 2 more course,that is human anatomy physiology and spermatophyte systematic. On odd semester 2014/2015 in animal ecology course whereas on even semester 2014/2014 in Microbiology course.

### Research Methods

This study used a qualitative approach with a case study (Yin,2006). Research question is focused on "how " and "why" aspect to implementation of lesson study in Spermatophyte Systematic course through problem based learning (PBL) in Biology education department Universitas Muhammadiyah Bengkulu. Data obtained by implementing documentation, observation sheets, test sheets, and student work during the implementation of lesson studi in Biology education department Universitas Muhammadiyah Bengkulu in October-November 2013.

### Collecting data Tehniques

The data collection techniques in this study are as follows :

1. Student learning activity  
Students' activity data obtained through observation sheets filled by observer during lecture in classroom.
2. Students Understanding  
Students' understanding data againts spermatophyte systematic course obtained by giving cognitive test to students after learning process.

### Reflection

Reflection is held by having reflection on discussion after the lecture takes place. Discussion participants are lecturer model and observer.

### Research Results

#### A. Research Result

Lesson study activity has been done in Biology education department in august to november 2013,in spermatophyte systematic cours,with the results as follows :

The main agenda from this activity is implementation of open lessso in spermatophyte systematic course with lecturer model Drs.Santoso,M.Si and observer 1. Dr. Irwandi, M.Pd, 2. Dr. Rusdi, M.Si, 3. Drs. C. Darwin, M.Pd,4. Drs. Nasral, M.Pd, 5. Paryanto, M.Pd, 6. Tomi Hidayat, M. Pd and technicians Paryanto, M.Pd. There are 35 Students

involved who take spermatophyte systematic course in 5th Semester. Implementaion of this open lesson consists of 4 cycles. Each cycle is hel discussion plan (plan),implementation in the classroom (do) and reflection from each end of activity (see).

1.Student Learning Activity

Cycle I

Media and learning device is still not complete,as there is no laptop, only one reference book,many specimens were wrong,and the lack of student understanding,the need for clarity in the division of time each learning steps. Students are less active discussion to respond and explain to other groups,and less daring to ask the lecturer about things that have not been understood. Students are still paying less attention to other group in listening to presentation. Group discussion is still less interactive and dominated only by certain people. Interaction in group discussions are a little better.

Cycle II

General observation has improved to a better direction,but there are somethings that need to be improved. During class discussions are still lacking students give arguments,only able to read reference. Student understanding of the course material is still lacking when associated with the original media. The presentation has been balance among sources theory or media with the examples of existing specimens,the working group has been good,and has been utilizing information technology.

Cycle III

Students have observed to native biological media as the leaves of plants in learning process.Gropu discussion of existing student interaction between students and other students. Existing argumentation among students. Contextual material has been started to be understood. Feedback discussions, behaviour,internet facilities have been already good.

Cycle IV

Students have been serious in group discussion, be able to explain in the discussion and are familiar with the group discussion in class learning. Discussion activity in the group has been good by utilizing existing media with internet connection on their laptop. Active role in responding to the presentation of other groups in the class discussion. Debate argument has been increasing and each group involved actively responding to questions.

2. Student learning result

In open lesson 1 activity with gymnospermae topic obtained the average lesson result 61.43, open lesson 2 with agiospermae topic the average learning result 67.03, open lesson 3 with monocotyl topic obatined the average student learning result 71.03, and open lesson 4 with dicotyl topic obtained 76.37 the average student learning result. This means,there is an increase in student results from open lesson 1 to open lesson 4. (see table 2)

Table 2 student learning result in spermatophyte systematic plant course

No	Student Name	OP I	OP II	OP III	OP IV
1	ANGI AL QORANA	50	55	55	65
2	ANIS NURIFA	60	65	70	73
3	AYANG SARI	65	70	78	82
4	AYU PERMATA SARI	65	70	70	83
5	DECKI PURNAMANSYAH	60	75	78	86
6	DEKO PRAWOTO	55	70	70	73
7	DESI EFRIANTI	50	65	65	68
8	DESI SURYANI	60	75	78	88
9	DESTRIANI	75	80	82	90
10	DEVI RIANTI	70	70	72	80
11	EMYLDA DWI SARANTIKA	65	75	78	81
12	ERTAMI	60	60	65	71
13	FAJRILLAH TANJUNG	65	60	70	75
14	GINA INDER LINA	70	75	73	75
15	IMA TRIANA	65	60	70	70
16	MENIK ZULYASTUTI	55	65	70	73
17	MERTY SARI	50	55	66	65
18	METRIANI	50	50	56	65
19	MEZI ANROPIKA	75	80	81	82
20	MULYADI SALEH	70	75	76	78
21	MUNAWAROH	70	75	78	81

22	NOVA SATRIANI	65	65	70	76
23	NOVITA SARI	75	85	85	90
24	NURUL FITRIYAH	65	70	70	74
25	PUTRI NUR ASTUTI	65	65	72	74
26	RACHMA KURNIAWATI	80	80	85	90
27	REZA YUNITA	50	55	60	67
28	RICCHA DORA LISMA	60	56	70	75
29	RINI ISLAWATI	50	65	65	72
30	RIRIN DASMANELA	65	65	75	78
31	SALTRI IFTAHUL JANNAH	50	55	60	70
32	WARMAN KUDUS	60	70	75	77
33	YANI ERNAWATI	60	60	70	80
34	YESI EMILIA	50	65	65	76
35	NINIK WINARNI	50	65	63	70
	<b>TOTAL</b>	2150	2346	2486	2673
	<b>Average</b>	<b>61,43</b>	<b>67,03</b>	<b>71,03</b>	<b>76,37</b>

### Discussion

From the reflection implementation of problem based learning as implementation of lesson study in spermatophyte systematic plant in Biology education department Universitas Muhammadiyah Bengkulu can be seen that there is an increase in the

activity of the lecture on students seen from reflection result open lesson 1 to 4. Learning interaction between students and students, discussion process, as well as students understanding of the lecture material has increased significantly.

Table 3 Reflection results open lesson I-IV

OPEN LESSON I REFLECTION	OPEN LESSON II REFLECTION	OPEN LESSON III REFLECTION	OPEN LESSON IV REFLECTION
(1) Specimens were taken still incomplete or even wrong (2) Less Spirit in describing the discussion results (3) Less active and coomunicative in giving opinion	(1) Less passionate so that discussion process is not optimal (2) Lack of understanding due to lack of preparation (3) In the discussions are still reading by reference to, and are not able to develop with their own language or words.	(1) there are arguments between students already. (2) Contextual material that has been begun to be understood (3) Feedback discussion has been good (4) There is increasing interaction between group members (5) Mutual argumentation between groups has existed	(1) The discussion accustomed so good enough (2) generally good Overall (3) there is still a group who are less active (4) Arguments between groups is quite good (5) group discussion is good enough.

Student learning results, that is from open lesson 1 :61.43, open lesson 2 : 67.03, open lesson 3: 71.03, and open lesson 4 : 76.37. this is consistent with the advantages of PBL among others: (a) become easier to remember and increased understanding of teaching materials, (b) focus on relevant knowledge, (c) Encourages to think (d) build teamwork, leadership and social skills, (e) build learning skills, (f) Motivate students (Amir, 2009). Lesson study conducted in the classroom with the aim to better understand students and conducted jointly with other lecturer (Rahayu, 2005)

Lesson study is a model of professional development of educators through collaborative learning assessment and sustainable based on the principles of collegiality and mutual learning to build a learning community (Sumar Hendayana, dkk :2006). Lesson study is a comprehensive approach toward professional learning and sustain lecturer become lifelong learners in developing and improve the quality of learning in the classroom. Lesson study is not a method or learning strategy but lesson study activities can apply various methods or learning strategies appropriate to the circumstances, conditions and problems faced by lecturer. Susilo (2006) also stated that through

lesson study, teachers/lectures can assess and develop the learning which can be developed.

In addition to the above, lesson study also can improve the quality of learning and has been conducted in Japan. Lesson study is considered as the secret of Japan's success in improving the quality of education. Stigler and Hiebert (1999) identified several factors which made lesson study can improve the quality of Japan's education : Lesson study is based on a model of learning that are continually increased. Although improvement is achieved through the lesson study activities only slightly, but because of the activities carried out constantly then it becomes great. Lesson study is always focused on how to make students learn. The purpose of education is to make student learn, therefore, any education program should be directed to help the student improve and success in learning. Lesson study focusing on the improvement that can be directly utilized in the existing context. Each learning activity is a unit that must be analyzed and improved so that improvement can be applied directly. Lesson study is a collaboration. By collaborating teachers can exchange ideas directly each other and give feedback for improving the quality of learning.

## Conclusions and Recommendations

### 1. Conclusions

The conclusions obtained from application of problem based learning (PBL) as the implementation of lesson study in spermatophyte systematic plant course in Biology education department Universitas Muhammadiyah Bengkulu, are as follows :

- a. There is an increase in students learning activities in both the original media observation of learning activities and in class activities and group discussions.
- b. There is an increase in student learning, ie, Open Lesson 1: 61.43, Open Lesson 2: 67.03, Open Lesson 3: 71.03, dan Open Lesson 4 : 76.37.

### 2. Recommendations

Recommendations from this activity, namely:

- a. It should be followed up for the next stage that is each lecture always implement lesson study in Biology Education Department Universitas Muhammadiyah Bengkulu, by entering that program as one of requirements for lecturer to get a promotion
- b. Before open lesson activity is conducted, need to discuss with lecturer team first, so that activities can be carried out smoothly.

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## Challenges to the Improvement of Teaching and Learning Practices through Action Research *Group work Activity in Senegal*

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**Abstract:** This paper reports on an action research that attempted to improve teaching and learning practices in Senegal by focusing on group work activities. Group work has been regarded as an important teaching method since the introduction of a new competency-based curriculum in 2009. Despite the effort over the last couple of years, significant changes in the students’ learning experiences have not yet occurred. Concerned about the situation, a project, called *Projet de Renforcement de l’Enseignement des Mathématiques, des Sciences et de la Technologie* (PREMST) supported by the Japan International Cooperation Agency’s (JICA) conducted lesson observations and identified that teachers rarely questioned the actual functioning of group work activities. To address that issue, the project team organized an action research that aims at activating and functionalizing group work activities by using lesson study model. Fourteen schools were selected as the sites of this action research and thirty five teachers were observed. As a result of this research, the teachers focused more on each student’s learning process, and they started to give instructions to students who had difficulties. Moreover, there was a definite improvement in the students’ communication capacities, and the majority of students actively participated in group activities, whereas before the research group work had been dominated by certain leaders. Also, this research implies that lesson study is a mechanism in which both teaching and learning practices are continuously changing.

**Keywords:** Lesson study, Action research, In-service teacher training, Primary education, Education in Africa

### 1 INTRODUCTION

This paper reports on an action research that attempted to improve teaching and learning practices in Senegal by focusing on group work activities. Group work has been adopted in several countries (Cohen, D. K. 1990, Kutnick et al. 2005). The active exchange of ideas within groups gives students an opportunity to engage in discussion, take responsibility for their own learning, and thus become critical thinkers (Totten, Sills, Digby, and Russ 1991). Similar educational challenges have been occurred in under-resourced countries, including Sub-Saharan African countries (see for example O’Sullivan 2004). Although group work is widely accepted and practiced in the classroom, it is also reported that teachers rarely questioned how to utilize such pedagogical method to attain lesson objectives (Barrett 2007). Senegal confronts with a similar problem. Group work has been regarded as an important teaching method since the introduction of a new competency-based curriculum in 2009. Despite the effort over the last couple of years, significant changes in the students’ learning experiences have not yet occurred. Concerned about

the situation, a project, called *Projet de Renforcement de l’Enseignement des Mathématiques, des Sciences et de la Technologie* (PREMST) supported by the Japan International Cooperation Agency’s (JICA) conducted lesson observation and identified that teachers rarely questioned the actual functioning of group work activities. By monitoring lesson study at clustered in-service teacher training, *Cellule d’Animation Pédagogique* (CAP), the national trainers of the project realized that teachers regarded group work as a “panacea” of teaching and it would automatically improve learning in the classroom. Although group work is regarded as one of the important teaching methods, many teachers have not paid attention to student discussions and only conducted a “surveillance” of the classroom. Furthermore, when developing group work assignments, teachers rarely gave assignments which promoted open thinking. Therefore, to address those issues, PREMST organized, as a part of its activities, the action research that aims at activating and functionalizing group work activities by using lesson study model. This paper reports on the results as well as the lessons learned from the action research conducted in 2014.

In this paper, first, I present an overview of primary education in Senegal, focusing on the teacher training system and JICA's approach. Then, in the third section, the action research implementation processes, such as the sample school selection method and details of the intervention conducted by the project team, are explained. In the fourth section, the results of the pre-test and post-test on the teachers' teaching practices and the students' learning experience are analysed. The perceptions of the teachers and school principals, which were collected via questionnaires, are used to support the analysis of the progress in teaching and learning practices. Finally, this paper concludes by providing some implications for future studies and project activities.

## 2 TEACHER EDUCATION AT THE PRIMARY LEVEL IN SENEGAL

The Senegalese government started an educational development program called *Programme d'Amélioration de la Qualité, de l'Équité, et de la Transparence* (PAQUET) in 2013. The PAQUET aims to develop human resources to contribute to sustainable development. In this program, the Government gives a priority to education and training in mathematics and sciences (République du Sénégal 2013). Therefore, sciences and mathematics teacher training is high government priority. In Senegal, teacher training can be divided into two categories. One is the initial training at the teacher training center *Centre Régionaux de Formation Personnels de l'Éducation* (CRFPE). Teacher training at CRFPE, however, is only 9 months; therefore, a program of initial training did not correspond with such a short period. The second type of teacher training is the clustered in-service teacher training, *Cellule d'Animation Pédagogique* (CAP). The CAP is conducted monthly at the cluster level and is separated from the ad-hoc-type training supported by the Ministry of National Education (MEN) and other donors. All teachers have to participate in the CAP without any per-diems. Since 2007, PREMST has used this in-service teacher training system to improve the quality of cluster training.

MEN appointed eleven national trainers from different departments of the Ministry as well as the regional offices. They take charge of all aspects of training from the development of training content, the implementation of training to the monitoring of all levels of training.

During the phase 1 of the project, PREMST has reorganized the CAP and introduced modules on science, mathematics and teaching methods to improve the teaching capacity of teachers (JICA 2010). Based on these results, JICA and MEN decided to continue the project and introduced "Lesson Study" to Senegal in order to establish a continuous in-service training model and to improve the teaching practices at a classroom level. Senegalese lesson study is conducted at CAP whereby teachers from several schools observe lessons and discuss them with their classmates. This lesson study model was officially adopted by MEN and is expected to be introduced to all 14 regions by 2015. The lesson study will be conducted in 8,800 primary schools, targeting all teachers.

## 3 RESEARCH METHOD

This research involved four steps: 1. a pre-test, 2. training that introduces new concept of group work, 3. the implementation, and 4. a post-test. During the implementation phase, teachers strived to improve practices in a classroom using a lesson study model, such as the preparation of lessons by teachers, the implementation of lessons, the analysis of lessons and the feedbacks from colleagues, and the reflection of suggestions to next lessons. Fourteen schools were selected as the sites and thirty five teachers participated in this action research. The project team asked the Academy Inspectorate (*Inspection d'Académie*: IA) in the three regions to select one school per department. The criteria of the selection were that the school principal and teachers should be motivated and talented and that the school should be close to the department's inspection office. For the support at school level, fifteen school principals, eight national trainers, and two Japanese experts were involved into the research. School principals were asked to examine all lesson plans and provide feedbacks to teachers before conducting the lessons. They also observed those lessons and discussed the lesson afterward. The national trainers and Japanese experts also visited schools to provide support to teachers and school principals at school level. Personally, I visited three schools and observed three lessons during the implementation period. And I visited two schools and observed four lessons at the post-test.

## 4 IMPLEMENTATION OF THE ACTION RESEARCH

### 4.1 Result of the pre-test

For the pre-test, the lessons of thirty five teachers were observed to collect the baseline data. During the pre-test, teachers were evaluated by national trainers using a lesson observation sheet, which consisted of two main aspects; students and teachers. Each item was given a score between 0 and 3; 0 (unsatisfactory), 1 (moderately satisfactory), 2 (satisfactory), 3 (very satisfactory). For the students' evaluation items, students were scored based on their understanding and degree of group work participation through lesson observations. For the teacher evaluation items, teachers were evaluated based on their attitude toward the students and their aptitude for teaching. The results of the pre-test revealed that students had difficulties in expressing their ideas, during group work activities. For teachers, it was observed that they did not give suitable tasks for group discussions and did not provide sufficient support to students during group work (See Annex 1).

### 4.2 Training to introduce new concept of group work and tools

Based on the results of this pre-test, the national trainers developed a module and organized a training to strengthen the teachers' knowledge and techniques with regard to group work. Since the group work activities had not fully functioned at classroom level, concepts and techniques which can be applied in practice were explained. Concretely, national trainers explained, by using a module, the reasons why teachers were encouraged to conduct group work in the lessons, the timing of group work activities, and techniques of which teachers could utilize for better communication among students.

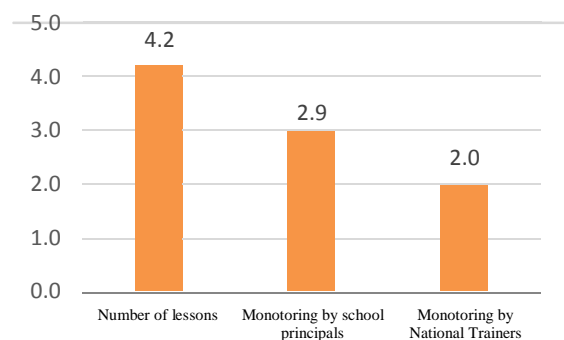
Teachers had had difficulties in using group work as an efficient teaching method. They had been satisfied if students discussed something with group members. The module emphasized that group work was just a teaching method, and it has to be utilized to attain lesson objectives. In addition, the module explained the importance of the process of learning. Teachers tended to focus on the result of group work by which only a few students contributed in each group. Teachers rarely paid attention to the answer of individual group members. During the training, national trainers encouraged teachers to focus on ideas of individual students.

In order to apply these new concepts and techniques at the practice, three tools were introduced, one of which was an introductory tool that allowed students to understand how to talk and how to listen during group work. As students were not accustomed to discussions with their classmates, to facilitate these discussions, the project team introduced group work guidelines. The second tool used was a formative evaluation tool for teachers. One of the difficulties observed by the national trainers was that teachers were not effectively observing the discussions. Teachers were observing each group but were not listening to the discussions. To promote more focused listening, this tool was introduced to encourage teachers to take a note of students' ideas. The third tool used was a work sheet for students. It allowed the teachers to understand the learning progress and each student's difficulties, and it allowed students to visualize and understand the steps in the lessons.

### 4.3 The implementation phase

From the end of April to the beginning of June 2014, teachers were asked to conduct at least five lessons that adopt the modality of group work. Figure 1 shows the number of lessons conducted by teachers and the number of monitoring sessions conducted by the school principals and national trainers during that period.

Figure 1: Number of lessons and number of monitoring sessions conducted by school principals and national trainers (N = 35)



Source: PREMST 2 (2014b)

Through the monitoring, national trainers and Japanese experts witnessed that many teachers tried to use tools. For example, many teachers tried to install introductory tools by using posters. Those posters showed how to listen and how to speak during group discussion. Furthermore, several

teachers reminded those rules of discussion during group work. Also, teachers challenged to use work sheet in their lessons. In almost all lessons, teachers prepared work sheets and tried to improve the quality of learning. National trainers and Japanese experts observed that teachers repeatedly explained how to use work sheet since it was new for students. Sometimes, teachers carefully observed the utilization of work sheet during individual work and group work. In regard to the formative evaluation tool, it was not necessarily utilized by teachers. They had difficulties in using this tool during their lessons. Especially, teachers mentioned that they did not have enough time to write down students learning process on the tool. However, teachers tried to understand students' learning process in a different manner, as I will explain afterward.

Although, there were many efforts for the utilization of tools, through the monitoring, national trainers and Japanese experts realized that there were misunderstanding of its utilization. Especially, teachers had difficulties in developing work sheets. The module showed only one example each of work sheet for mathematics and science. Teachers simply copied the model of those work sheets regardless the contents of each lesson. Because of the insufficient understanding about work sheet, some teachers misunderstood that they always had to conduct experimentations, or students had to formulate hypothesis in all lessons, even when conducting experimentations is not suitable for attain lesson objectives. Another difficulty was that some teachers understood work sheet as a kind of evaluation tool at the end of the lesson. National trainers intended to use work sheet to visualize the process of learning. However, several teachers distributed work sheet at the conclusion of lesson and asked students to fill in. One of the lessons which I observed was a lesson of mathematics. It was an introduction of the lesson of decimal number and a teacher set an objective as students could explain the decimal number. In this lesson, the teacher used the work sheet as the evaluation of the lesson. It means that students had to fill in work sheet after long explanation of teachers. This lesson took three hours and students had to endure the painful lesson without break. After this lesson, a national trainer, a school principal, and the teacher talked about her lesson. In this discussion, the school principal suggested that she should use work sheet during her lesson to help them learn better. He explained how to use it as an efficient tool considering lesson contents and lesson objective. The school principal also encouraged her to prepare a plan of next lesson especially focusing of the utilization of work sheet.

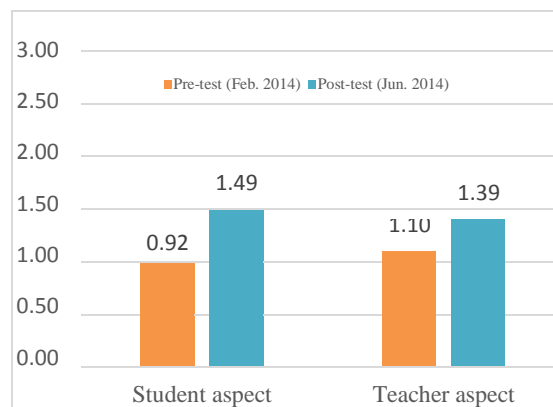
## 4.4 Results of the post-test

After the implementation period, the national trainers observed the lessons of each teacher as a post-test using the same lesson observation sheet and the same questionnaire as in the pre-test. The project team conducted a questionnaire for the school principals to collect their perceptions of the activity. This section analyses the results of the post-test, by comparing the scores of the pre- and post-test and the qualitative data.

### 4.4.1 Comparison of the lesson observation scores in the pre-test and post-test

The results from the post-test showed that both the students' and teachers' practices improved, as shown below. Figure 2 shows the progress from the pre- to the post-test. As can be observed, the students improved from 0.92 to 1.49, whereas the teachers progressed from 1.10 to 1.39.

Figure 2: Comparison of the lesson observation scores in the pre- and post-test (N = 35)



Source: PREMST 2 (2014b)

A paired two samples t-test was conducted to compare the score in pre-test with the score in post-test for student aspect. There was a significant difference in the score for the student aspect score in pre-test and post-test ( $M=-0.57$ ,  $SD=0.091$ );  $t(34)=6.19$ , two-tail  $p <=0.001$ . (See Annex 2).

For teacher aspect also, a paired two samples t-test was conducted to compare the score in pre-test and the score in post-test. There was a significant difference in the score for the teacher aspect score in pre-test and post-test ( $M=-0.30$ ,  $SD=0.46$ ,  $N=35$ );  $t(34)=3.83$ , two-tail  $p <=0.001$ . (See Annex 3).

For the comparison result between the pre- and post-test, while students and teachers did



achieve a satisfactory score in several items, some other items needed more improvement. From these post-test results, it can be seen that students still have difficulties in the elaboration of the experimentation protocol for hypothesis verification, participation during practical activities, and the formulation of conclusions from the activity. However, the students had a relatively satisfactory score for commitment of group work activities, the capacity to listen, the capacity to express their own ideas, and the capacity to elaborate production with group members.

Students demonstrated significant improvement in how to use the work sheets. Students also improved their listening capacity and the capacity to express their own ideas which are the main communication requirements for students. As regards the items that showed little improvement, students still demonstrated difficulties in elaborating the experimentation protocol for hypothesis verification, and they were also not good at participation during practical activities, such as experimenting, with their classmates. Regarding the commitment in group work activities, as students get committed in the group work activity in the pre-test, there was a relatively high score in the post-test, but the gain was considered unsatisfactory (See Annex 4).

Also, the post-test results showed that teachers still needed to focus more on the creation of the condition for finding problems, assistance in hypothesis formulation, and support for the elaboration of the verification protocol. However, the post-test scores for teachers were relatively satisfactory for the development of group work, the monitoring of task execution, and the implications for students on the elaboration of the concept and theorem.

For those items that showed a superior gain, it seems that while teachers improved their assistance in hypothesis formulation, the post-test score was still relatively low. Further, from these results, the teachers appeared to have focused on the support of the group activities and inviting their students to elaborate the concepts and theorems at the end of their lesson. For those items that had inferior gains, the teachers appear to have had difficulty in elaborating the verification protocol with the students since the pre-test. About the clarity of instruction, while the score was higher than the pre-test, the gain was not significant. For the remind of security instructions, even though there was a -0.35 gain on the pre-test, the national trainers considered this item to be inapplicable because almost no lessons conducted dangerous experimentation. Therefore, scored this as N.A in the post. That is the

reason why the score of the post-test is inferior to that of the pre-test (See Annex 5).

#### 4.4.2 Questionnaires

In addition to the post-test results, qualitative research was conducted, by applying questionnaires on the teachers and school principals, in which they gave their perceptions on the improvements in the students' and teachers' attitudes, as shown below.

- ✚ Improvement in students' attitudes through the action research
  - High motivation for group work
  - Active participation of all students (Leader is not always the one who dominates the discussion)
  - Emulation among groups
  - Better communication and mutual support among students
  - Understanding the scientific approach concept
- ✚ Improvement of teachers' attitudes through the action research
  - Better supports and analysis of student progress by the teacher
  - Active communication between teachers and students
  - Giving responsibility to students
  - Frequent communication among teachers
  - Practice of “student centered” lessons
  - Preparation of more objective lesson plan because of discussions with colleagues
  - Understanding the importance of preparation of lessons and conducting research by teachers
  - Realization of the diversity of students and their answers
  - Paying attention to both students' answers and students' competences

These answers show that teacher and school principals felt that the students became more motivated to work together. In addition, through this action research, the teachers and school principals felt that the students were being trained to be independent learners and to functionalize their group work with their classmates. In terms of teacher improvement, both school principals and teachers felt that they focused more on each student's learning process. In addition, teachers realized the importance of preparation of lessons and conducting researches. They also frequently communicated with their students to support and facilitate the group work activities.

#### 4.4.3 Description of lesson observation

As shown in the previous section, the scores in the lesson observation are improved. Both students and teachers changed their practices in the classroom. This section shows, using descriptions of lesson observations of one class, how one teacher and his students have changed their practices. The project team filmed three lessons, one is the lesson of pre-test, another is the lesson observed during the implementation period and the other is the lesson of post-test. This class received the visit of national trainers and the project team twice during the implementation phase.

From these descriptions, the students of this class seemed to have improved their attitudes to learning. At the beginning, they had difficulties in formulating their own ideas and group work had not functioned at all. Almost all students did not understand assignments of group work and discussions have been dominated by certain students. Apparently, they were not accustomed to formulating their own ideas and they hesitated to work with their group members. However, through this research, students learned to explain their ideas and discuss with their classmates by following rules of group work such as how to organize group discussions, how to speak own ideas and how to listen ideas of others. In addition to the communication among students, students also actively communicated with their teacher to require him to clarify his instructions.

For the teacher aspects, the teacher improved his practices step by step. At the beginning, he did not pay attention to learning process of each student. What he have done was just a “surveillance” in which he checked whether students worked hard or not. However, at the end, he provided supports more than before and he gave several instructions to students who had difficulties. Apparently, the introduction of work sheet made a confusion among students at the beginning. However, in order to solve the problems, the teacher carefully observed learning process of each students at the end (See Annex 6).

The questionnaire also confirms the change of his perception. During the pre-test, we asked the reason why the teacher had conducted group work activities in his lesson. Then, he vaguely answered that group work was conducted to exchange ideas among group members. However, when the same question was asked at the post-test, his answer became a lot more concrete. He mentioned that he conducted the group work because it was a tool to involve all students in his lesson and to induce their interest in participating in the lesson of germination and agriculture related subjects. His remark confirms that he adopted group work, by considering the

contents and topics of the lesson. In addition, we asked him the satisfaction of lessons. At the pre-test, he was satisfied if students participated in the group work. He was satisfied if children had discussed something with group members regardless the contents of discussion. In addition, he did not pay attention to the discussion contents. Group work itself did not have any meaning for the lesson conclusion. But, at the post-test, he was satisfied because students had been able to draw the conclusion from the discussion with their group members. It means that he started to utilize group work as a teaching method. Thus, through this research, he has learned to use group work as an efficient tool to achieve the lesson objectives, whereas before this research, he had conducted the group work not paying attention to its consistency with the lesson objective.

Apparently, several improvements of teaching practices were observed. However, his practices left much room for improvements. For example, his attitudes to students were not always supportive as shown in the description. He did not give sufficient time for thinking and discussing during individual work and group works. He gave a higher priority to the management of lesson time and he, sometimes, paid less attention to students’ learning progress.

#### 4.4.4 Summary of results

As shown above, through this research, students are accustomed to use work sheet and to improve their communication capacity. Especially, the discussion during the group work is more democratized. Also, as teachers and school principals confirmed, students actively participate in discussions and they are motivated to conduct group work. However, students may need more effort to conduct better group work. For example, they have a difficulty in elaborating the experimentation protocol for hypothesis verification and they sometime hesitated to participate in practical activities, such as experimentation.

Teachers also improved their teaching practices. They started supporting the development of group work. They frequently observed students’ task execution and they gave instructions if needed. These changes are also reported by school principals. Also, teachers may start reflecting their practices and changed their practices based on their reflection. For example, teachers tried to remind the rules of discussion to fictionalize group work since they realized that their supports were not enough. However, their practices left much room for improvements. They have to focus more on the

creation of the condition for finding problems, assistance in hypothesis formulation, and support for the elaboration of the verification protocol.

## 5. DISCUSSION

### 5.1 Improvement cycle of teaching and learning practices

As shown in the previous section, both students and teachers improved their practices through this action research. Especially, students improved their communication capacity, which can lead to better discussions in group. Such improvements in the communication capacity of students were also confirmed by the answers of questionnaires. Both teachers and school principals perceived that the majority of students actively participated in group activities, whereas before this research, group work tended to be dominated by certain leaders. As the students became accustomed to working with their classmates, the discussion within the group gradually opened to everybody. Also, the lesson observations showed improvements of students' practices. They could express their own ideas and discussed with their colleagues. Then, they could formulate interesting ideas by collaborating with their group members. In addition, teachers and school principals perceived that students began to develop a mechanism of collaboration among themselves. For example, they observed that students support their classmates who have difficulties.

Such a demonstration of student maturity did not occur without the maturity of teaching practices. It might be a result of the improved instructions given by the teachers. As confirmed by the post-test results, teachers circulated around groups to understand each student's progress, and then they gave instructions for group work activities. Teachers had to circulate around the classroom because students were unaccustomed to the utilization of work sheet, and many groups could not write anything without the support of teachers. It appears that the fact that students had difficulties in using work sheets encouraged teachers to observe the learning process of each student. The case of the earlier example of the teacher whose lessons were analysed illustrates this point. In his class, the introduction of work sheet made a confusion among students at the beginning. But, this situation forced him to observe carefully the learning process of each students. He gradually changed a function of monitoring. At the beginning, he had simply conducted “surveillance” in the classroom. By the

end, however, his monitoring was meant to support the students, by checking the answers of students and giving instructions to students who had difficulties. In fact, similar changes were reported at least in some of the teachers observed by national trainers and another Japanese expert. One of the significant impacts of this research is that the teachers have started realizing to what extent the students understood or did not understand the lessons, and teachers started focusing on each student's learning process. Also, through the process of lesson study, some teachers seemed to realize the importance of exchange of ideas with their colleagues. And they pointed at the necessity of the preparation of lesson plans and conducting small scale studies for their lesson preparations.

As mentioned above, the learning practices of students are improved by the change of teaching practices. It is also true that the change of teaching practices is influenced by the self-reflection of teachers. This process is a part of lesson study cycle. The teachers found problems of their own lessons through the observation of their students, or sometimes feedbacks from their colleagues. And they tried to improve their teaching practices for a better functionalized group work. As the result of the reflection of teachers' efforts, students also gradually changed their practices. Following the instructions of teachers, students started to discuss with their group members and they expressed their own ideas. This research demonstrates that lesson study can be a mechanism in which both teaching and learning practices are continuously changing.

### 5.2 Challenges for a better functioning of group work

Although both students and teachers began changing their practices, there are still several challenges. For example, teachers themselves seemed to have little understanding about how to formulate hypothesis or elaborate experimentation protocols. In other words, they hardly understood the procedure of the lessons with experimentations or how to practice it in the classroom. This insufficiency in the teachers' understanding strongly influenced the students' learning. As explained, students had difficulties in elaborating the protocol for hypothesis verification and practicing experimentation. The same tendency is observed on the inferior scores in the teachers' items for creating conditions for finding problems, assisting in hypothesis formulation, and supporting the elaboration of the verification protocol. In fact, during the post-test lesson observation, we found that some teachers and even some school principals

failed to understand the meaning of hypothesis and how to elaborate it. One of the reasons why teachers did not understand the experimental approach may be a lack of experience. They might have not experienced such a lesson during their childhood, or they may not have conducted such lessons to their students before. In addition, teachers have no supporting materials to conduct this type of lesson. Obviously, if they are unaccustomed to conduct experimentations, they may hesitate to practice it in front of their students.

Another challenge might be coherence of lesson. As explained, the students need more efforts to formulate conclusions from group work activities. The students had difficulties in drawing conclusion of lesson from their activities. However, it is not necessarily a problem of students. Through this research, teachers learned to adopt group work in their lessons. But, unfortunately, the objective of group work was not always consistent with the objective of the lesson. Even though the students showed interesting opinions during their group works, teachers did not fully utilize these answers to deepen their understanding. The lesson observation of the post-test reported the difficulties of formulating conclusion because of the diversity of students' answers. Teachers need a capacity to understand and respond to students' unexpected answers in order to achieve the objective of lesson.

As mentioned in the previous section, lesson study is a mechanism in which both teaching and learning practices are continuously changed. In order to functionalize this learning mechanism, teachers needs more efforts as shown above. This research indicates the importance of conducting studies by teachers. In this research, the project decided to conduct lesson study in schools, and teachers analysed their practices concerning the learning practices of own students. Teachers should be encouraged to conduct small scale studies in the schools to make functionalize the continuous improvement process. The improvement of learning practices does not occur without the development of teaching practices. Teachers need to continue their studies to offer better lessons to students.

## 6. CONCLUSION AND FUTURE IMPLICATIONS

In this paper, the results of an action research that attempted to improve the teaching practices of teachers as well as the learning experiences of students were explained. As shown in the section of post-test result, the teachers focused more on each

student's learning process, and they started to give instructions to students who had difficulties, within the short implementation period. Moreover, there was a definite improvement in the students' communication capacities, and the majority of students actively participated in group activities, whereas before the research, group work had been dominated by certain leaders. Also, as discussed, this research implies that lesson study is a mechanism in which both teaching and learning practices are continuously changing. While this research resulted in some progress, there are still many challenges remaining. Some teachers did not understand the lessons with the experimental approach or how to put them into practice. This lack of understanding by the teacher strongly impacts student learning.

One of the possibilities for the future is the development of a package of lesson plans and a teacher's guidebook. As discussed, teachers seemed to have little understanding about how to use the experimental approach in the lessons. The package of lesson plans and the teacher's guidebook may allow teachers to understand the important points of the lessons more clearly and how they can be explained in the classroom.

Another implication is the need to develop effective teacher monitoring systems at the school level. For this action research, the project selected schools with motivated and talented school principals, who already played important roles in monitoring at the school level. Because of their efforts, this action research has managed to bring some progress in the learning and teaching practices. To implement this group work model in other schools, the capacity building of school principals is essential; therefore, the project needs to develop a monitoring system with the involvement of the talented school principals.

For the new phase of this action research, the project team intends to revise the guide and redesign the implementation structure based on lessons learned from this research. With regards to the problem of insufficient understanding of experimental approaches, national trainers added several examples of lesson plan and work sheet to encourage teachers to individualize their sheets. Also, for the monitoring by school principals, national trainers developed a tool for school principals to conduct effective monitoring. To confirm the effect of these approaches, the project team will continue with another cycle until the end of July 2015.

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Annex 1: Pre-test student and teacher scores (N = 35)

N	Item	Score
1-1	Elaboration of protocol for hypothesis verification	0.36
1-2	Utilization and analysis of available support: Work sheets	0.38
1-3	Participation during practical activities	1.16
1-4	Commitment in group work activities	1.37
1-5	Capacity to listen	1.03
1-6	Capacity to express their own ideas	0.94
1-7	Capacity to elaborate a product with group members	1.00
1-8	Formulation of conclusions from the activity	0.74
2-1	Creation of the condition for finding problems	0.88
2-2	Assistance in hypothesis formulation (plan for solution)	0.57
2-3	Support for the elaboration of the verification protocol	0.57
2-4	Development of group work	1.34
2-5	Relevance of tasks	1.23
2-6	Choice of learning materials and support	1.33
2-7	Clarity of the indication	1.49
2-8	Monitoring of the task execution	1.29
2-9	Remind of security instructions	1.10
2-10	Praise for students' work	0.94
2-11	Support for the students facing difficulty	0.80
2-12	Involvement of students on the elaboration of the concept and theories (Institutionalization)	1.29

Source: PREMST 2 (2014a)

Annex 2: t-Test result of student aspect score

t-Test: Paired Two Sample for Means

	Pre-test	Post-test
Mean	0.9241139	1.4917327
Variance	0.2504751	0.1804257
Observations	35	35
Pearson Correlation	0.3212992	
Hypothesized Mean Difference	0	
Df	34	
t Stat	-6.190131	
P(T<=t) one-tail	2.442E-07	
t Critical one-tail	1.6909243	
P(T<=t) two-tail	4.884E-07	
t Critical two-tail	2.0322445	

Source: Author

Descriptive Statistic of difference between pre-test and post-test	
Mean	-0.567618
Standard Error	0.091697
Median	-0.571428
Mode	-0.285714
Standard Deviation	0.542489
Sample Variance	0.294294
Kurtosis	0.085159
Skewness	-0.027001
Range	2.196428
Minimum	-1.625
Maximum	0.571428
Sum	-19.86665
Count	35
Confidence Level(95.0%)	0.1863515

Annex 3: t-Test result of teacher aspect score

t-Test: Paired Two Sample for Means

	Pre-test	Post-test
Mean	1.095584	1.393658
Variance	0.164122	0.1721093
Observations	35	35
Pearson Correlation	0.370616	
Hypothesized Mean Difference	0	
Df	34	
t Stat	-3.833048	
P(T<=t) one-tail	0.000260	
t Critical one-tail	1.690924	
P(T<=t) two-tail	0.000521	
t Critical two-tail	2.0322445	

Source: Author

Descriptive Statistic of difference between pre-test and post-test	
Mean	-0.298073
Standard Error	0.077764
Median	-0.2
Mode	#N/A
Standard Deviation	0.460058
Sample Variance	0.211653
Kurtosis	-0.589738
Skewness	0.010678
Range	1.884848
Minimum	-1.166666
Maximum	0.718181
Sum	-10.43257
Count	35
Confidence Level(95.0%)	0.1580357

Annex 4: Score for post-test student items (N = 35)

N	Item	Pre-test	Post-test	Gain
1-1	Elaboration of protocol for hypothesis verification	0.36	0.56	0.20
1-2	Utilization and analysis of available support: Work sheets	0.38	1.54	1.16
1-3	Participation during practical activities	1.16	1.18	0.02
1-4	Commitment in group work activities	1.37	1.64	0.27
1-5	Capacity to listen	1.03	1.68	0.65
1-6	Capacity to express their own ideas	0.94	1.73	0.79
1-7	Capacity to elaborate a product with group members	1.00	1.64	0.64
1-8	Formulation of conclusions from the activity	0.74	1.09	0.35

Source: PREMST 2 (2014b)

Annex 5: Score for post-test teacher items (N = 35)

N	Item	Pre-test	Post-test	Gain
2-1	Creation of the condition for finding problems	0.88	1.11	0.23
2-2	Assistance in hypothesis formulation (plan for solution)	0.57	1.00	0.43
2-3	Support for the elaboration of the verification protocol	0.57	0.63	0.07
2-4	Development of group work	1.34	1.70	0.36
2-5	Relevance of tasks	1.23	1.54	0.31
2-6	Choice of learning materials and support	1.33	1.53	0.20
2-7	Clarity of the indication	1.49	1.51	0.03
2-8	Monitoring of the task execution	1.29	1.70	0.41
2-9	Remind of security instructions	1.10	0.75	-0.35
2-10	Praise for students' work	0.94	1.30	0.36
2-11	Support for the students facing difficulty	0.80	1.16	0.36
2-12	Involvement of students on the elaboration of the concept and theories (Institutionalization)	1.29	1.73	0.44

Source: PREMST 2 (2014b)



Annex 6: Description of lesson observation

	Summary of lesson	Description	
Pre-test	<p><b>Topic: Teeth</b></p> <p>The objective of this lesson was to discover types of teeth and their functions. As an assignment, teacher asked their students to answer three questions such as, 1. What are roles of teeth?, 2. How many types of teeth are there?, 3. Give names of each type. Students started their individual work then conducted a group work. After presentations of 2 groups, the teacher started an explanation of functionality of teeth using a piece of bread and cloth. Some students demonstrated to tear a piece of cloth and bite a piece of bread. After these experimentations, the teacher wrote names of each type of teeth and their functions on a blackboard as a conclusion of the lesson.</p>	<b>Student Aspect: 0.75</b>	<b>Teacher Aspect: 1.00</b>
		<p><i>Student:</i></p> <ul style="list-style-type: none"> <li>• During individual work, many students didn't write their answers</li> <li>• During group work, students continued their individual work. Some group didn't discuss because they haven't finished individual work. Some students simply copied answers of the other students.</li> <li>• Students seemed to be interested in experimentations more than discussions without materials.</li> </ul> <p><i>Teacher :</i></p> <ul style="list-style-type: none"> <li>• The teacher didn't observe students' answers during individual work. He had to prepare an assignment of group work.</li> <li>• One student had difficulty in reading. What the teacher said was "You are too late!"</li> <li>• Insufficient time for assignments. The teacher said 5 minutes for the individual work but he gave 3 minutes. For the group work, he said 30 minutes but he gave 5 minutes.</li> <li>• The teacher looked around to conduct the surveillance of his students during group work</li> <li>• The conclusion of lesson was drawn from neither group work nor students' answers</li> </ul>	
Monitoring	<p><b>Topic: Reproduction of animals</b></p> <p>The objective of this lesson was to learn reproduction of animals. The teacher gave one question such as "How to reproduce these animals?: horses, cocks, birds, and man". First of all, in order to answer this question, individual work and group work were conducted. The represents of each group presented their productions. After those presentations, teacher asked to verify their answers. He distributed textbook and students conducted literature analysis. He concluded this lesson by filling a work sheet.</p>	<p><i>Student:</i></p> <ul style="list-style-type: none"> <li>• Some students asked their teacher to clarify his instructions.</li> <li>• For the first assignment, during individual work, students wrote their own answers. During group work, students followed rules of group discussion and each student showed and shared their own ideas</li> <li>• For the second assignment, they were not always independent learners. They didn't have enough time to think and share ideas with group members. What they had done was just reading the page of which teacher indicated.</li> </ul> <p><i>Teacher :</i></p> <ul style="list-style-type: none"> <li>• At the beginning of the lesson, teacher frequently changed his instructions. It made students confusions.</li> <li>• For the first assignment, the teacher looked around to conduct the surveillance of his students but he didn't check their answers during individual work. At the beginning of group work, he recalled rules of group work. Then he tried to check answer of each group using the monitoring tool and explained how to fill in work sheet. But he didn't have enough time to check all of them.</li> <li>• When teacher conducted his observation, what he said was "Hurry up! You are too late."</li> </ul>	

		<ul style="list-style-type: none"> <li>For the second assignment, teachers indicated pages of which the explication of reproduction was written. He didn't pay attention to progress of each student.</li> <li>To fill in the work sheet, he gave advices to students who had difficulties. He explained meaning of questions in French and Wolof, then he urged his students to elaborate their ideas.</li> </ul>
<b>Post-test</b>	<p><b>Topic: Germination</b></p> <p>The objective of this lesson was to learn conditions of germination. Before this lesson, in order to verify such conditions, students had prepared some pots. In this lesson, as a first assignment, students compared two pots; one was a pot which was watered and another was not watered. This first assignment was done by individual work and group work. For the second assignment, students observed the other pots which were prepared by students under different conditions. After observations, as a conclusion, the teacher explained conditions of germination by using the results of experimentation of pots.</p>	<p><b>Student Aspect: 1.67</b></p> <p><b>Teacher Aspect: 1.67</b></p> <p><i>Student:</i></p> <ul style="list-style-type: none"> <li>Students tried to observe pots in various ways. Some of them checked condition of soil and others checked seeds.</li> <li>Each student wrote down their own opinions during individual work</li> <li>For the second assignment, students actively discussed more than before since they had settled conditions of experimentation by themselves. They discussed results of experimentations and why their experimentations were failed or succeeded.</li> </ul> <p><i>Teacher :</i></p> <ul style="list-style-type: none"> <li>Instructions to students were clearer than before. The teacher explained what students have to do during individual work and group work. He also reminded how to use work sheet.</li> <li>At the beginning of group work, the teacher recalled rules of group work. He visited at each group to check whether students followed rules or not.</li> <li>He didn't give enough time for the second assignment. Students didn't have sufficient time to exchange their opinions.</li> <li>After the second assignment, students gave their interesting opinions about conditions of germination. But he couldn't utilize those answers to draw the conclusion since they were diverse.</li> </ul>

Source: Author

## Building Blocks, Stumbling Blocks -Student Responses In Understanding The Point, Line And Plane Through Dialogue

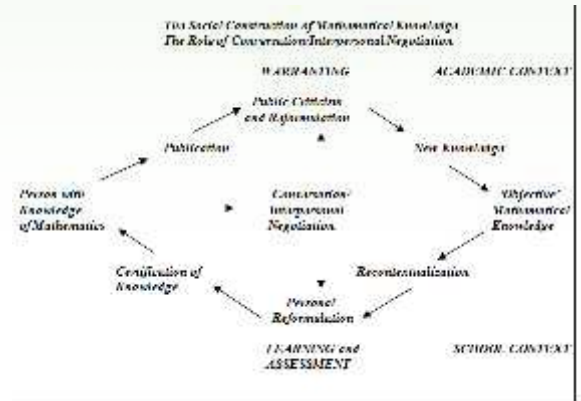
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### 1. STATEMENT OF THE PROBLEM

How do students participate through dialogue in their construction of knowledge about the undefined terms point, line and plane ?

### 2. BACKGROUND / REVIEW OF RELATED LITERATURE

This action research is a follow-up to my work in M.A. Basic Education, Major in Mathematics at the Ateneo de Manila University, finished in 2010, investigating the power of enhancing dialogue in the study of Geometry. The work is based on frameworks formulated by Paul Ernest under the social constructivist theories of learning. It also touches on philosophies related to how a pool of knowledge is always context bound and can never be looked at under the microscope of pure isolation. Interest in the work is specially spurred by almost two decades of dealing and always struggling with the geometric trinity of point, line, and plane in the classroom. For any true starting point in the study of how Euclidian Geometry is taught, it is this paper’s stand that there is always a call to go back to the undefined terms. Taken from said masteral work, Ernest’s framework is summarized in the following figure:



The Creative/Reproductive Cycle of Mathematics  
Source: Ernest, 1996

It cannot be overemphasized that students need to fully grasp the concepts point, line and plane to do well in Geometry and in any high school for that matter. The irony of it is that these concepts, called the building blocks of Geometry, are undefined terms! It is the position of this writer/researcher that this irony of ironies is taken lightly, ignored, or is not well researched enough. After all, how do we undertake a research on things we cannot even define? The gloss over on the problem is very unfortunate.

The primary literature for this action research is, of course, the masteral work submitted to the Principal’s Office in 2010: Enhancing Conversation and Dialogue in Geometry. The work is a compilation of worksheets supplementing a textbook in Geometry I was fortunate to have co-authored. The students can answer worksheets on particular topics. The worksheets emphasize the dialogue responses of acceptance, reaction, elaboration, criticism, and correction which Ernest defines as follows:

**Criticism:** In doing ‘criticism’, the student is called on to evaluate a mathematical concept or solution in terms of its strengths and weaknesses, with greater emphasis on the

latter. Rather than doing error-spotting, weakness-hunting is the core of doing criticism. The student can then offer alternative ways by which the concept, solution or process can be improved.

**Correction:** It is possible to make a student correct a concept or solution to a problem which is given to be erroneous. How the student identifies the error is sometimes the more important aspect of the task than finding the error itself. By correcting a given mathematical text, the student also demonstrates how he analyzes, synthesizes and evaluates using any tools he knows.

**Acceptance:** Acceptance refers to a student's agreeing to the truth proposed by a mathematical concept. It also demands that the student lays the basis for his acceptance of the concept.

**Elaboration:** In elaboration, a student is made to extend or expound on something already known. By extension, he/she can enumerate other relationships which come out as consequences of a given mathematical concept. He can also pick up the same concept and look at it from other perspectives or points of emphases.

**Reaction:** To react to a mathematical concept would mean that one or two particular details forcefully grab the attention of the student. This might be due to the novelty, strangeness, ingenuity, or controversy inherent in the concept.

It is through these levels of responses that students, by Ernest's framework, are thought to contribute to the social construction of knowledge.

### 3. RESEARCH METHOD

For data collection, the designed worksheet for the Building Blocks of Geometry are given to five Regular Geometry classes, each handled by a different teacher. This is in keeping with the aim of casting the net of dialogue as wide as possible. The students are given the first weekend after taking Long Test #1 to answer the worksheet as candidly and as honestly as possible.

It is the aim of the data gathering to gather varied and significant samples to each of the five possible responses. It is possible that only one of the five responses is taken from a

particular student. It is also possible that all five responses are that of a single student.

### WORKSHEET

Name \_\_\_\_\_ Section \_\_\_\_\_  
Due Jun 21, 2013

#### The Building Blocks of Geometry

1. What problems arise in your mind concerning the over-all framework/concept of the undefined terms? What weaknesses do you think can be addressed?
2. Which definition do you think can be simplified? What problems are you addressing by these simplifications? In what way do the concepts become better?
3. Does it make sense to talk about things which we cannot ever pin down to a definition we can all agree on? Why? Why not?
4. What is the best representation paper that we use for "space"? Why?
5. What is your reaction to the following statement? -- 'The Undefined Terms are the basic terms in Geometry.'

The questions above, correspondingly, elicit the following responses:

1 – criticism, 2 – correction, 3 – acceptance, 4 – elaboration, and 5 – reaction. The students are not made aware of the response types they are to make to avoid pre-empting their answers.

### 4. PRESENTATION OF DATA / INTERPRETATION OF DATA

It is deemed by this researcher that the presentation and interpretation of data are best put together in one section for ease of reading. The data gathered are put in boxes. Every box is followed accordingly by the interpretations.

1. What problems arise in your mind concerning the over-all framework/concept of the undefined terms? What weaknesses do you think can be

addressed ?

**RESPONSES:**

- a. I find the problem of the undefined terms is that they would be unclear per situation.
- b. It is hard to differentiate the meaning and definitions used to separate undefined terms and defined terms.
- c. I think that the undefined terms are too broad.
- d. A problem and a weakness is there could be various definitions given by different people.
- e. They are hard to measure and analyze.

Question #1 is a criticism item. It allows the students to focus on the weaknesses of a concept and to possibly offer alternatives. Response 'a' ties up this weakness to the reality of the different contexts in which the concept is understood. It is a recognition already of the student that knowledge is not produced out of pure and isolated contexts. Unconsciously, response 'a' is cognizant already of the social dimensions of learning. Responses 'c' and 'd' follow basically the same line of thought as that of response 'a'. Response 'd' goes deeper into the matter by identifying people as responsible for the social construction of knowledge and not simply inanimate entities varying from situation to situation. Response 'c' is also possibly a call to narrow down the parameters for the concept. It is already a voice calling out and participating in the dialogue, inviting responses, challenging norms.

Response 'b' looks into the structure of the field of knowledge. It is an analysis of the structural weaknesses propping concepts and definitions. It is a participation in the dialogue asking for consistency and the erasure of overlapping concepts. On a deeper level, and maybe tangentially, it might be looking already into how the power of language comes into play as it mentions in one breath *meaning* and *definitions*.

Response 'e' proves to be a real curiosity. It is the 3<sup>rd</sup> year student asking for that which is measurable. It is the 3<sup>rd</sup> year student still bound by the shackles of Algebra. At the same time, however, it is also putting a long-term dialogue about the concepts on the table. It is already raising potential difficulties that might

arise should the undefined terms be subjected to the rule of numbers. Response 'e' also surfaces, in criticism, the usual fears about mathematics

2. Which definition do you think can be simplified ? What problems are you addressing by these simplifications ? In what way do the concepts become better ?

**RESPONSES:**

- a. None. It's all pretty simple.
- b. The definition of the measure of an angle needs to be simplified. It can be simplified by removing "from one ray to the other". This makes it easier to understand.
- c. The concepts become better if they are written more specifically.
- d. Coplanar. I don't get some parts. There are a lot of lines and points outside and inside the plane.
- e. I think line segments should be defined as lines that end. It addresses the problem of them having points in between the endpoints.

Question #2 is a correction item. This allows the students to correct possible errors. It proves to be a heavier question since it is not that easy correcting undefined terms. Response 'a' easily proves the point. Resignation and hubris are both rolled up in response 'a'. Response 'b' is very clear as to what it needs to correct and, at the same time, offers a solution. The student is saying that he understands what an angle is and that he does not need to know that it happens "from one ray to the other". The correction in the response can also be read as a caution on the use of language. Language, being powerfully loaded, does not always help in clarifying things !

Response 'c' is very akin to response 'b'. In its social ramifications, response 'c' sees the written text as contributing to the pool of knowledge. The student here is more like having a dialogue with the written text. A response like this might be fairly commonly expected of good readers.

Response 'd' demands a correction and does not really correct per se. It attempts to analyze parts and components and sees that any correction must happen through these. It

recognizes that sometimes only parts need corrections leaving the general concept standing. Response 'e' attempts to make a correction by abbreviation. The simpler it is said, the better. In the process, it demonstrates confidence that all other grounds are covered already.

3. Does it make sense to talk about things which we cannot ever pin down to a definition we can all agree on? Why? Why not?

**RESPONSES:**

- Yes because life is like that.
- Yes because it improves our way of thinking and the range of our imagination.
- Yes. At least we have a definition.
- It does because it can be understood.
- No. If we can't even know the definition how can we truly understand?

Question #3 checks on acceptance. Response 'a' takes us all to the cosmic level and demands of us a moment of silence. It sees mathematics as an inevitable fact and part of life. Any resignation to mathematics is a resignation to life and vice versa. Response 'b' accepts because it is good. Its acceptance is premised on the philosophy that man is a thinking being and that any improvement to how man thinks is always something to take positively.

Response 'c' is an acceptance based on a more utilitarian attitude to life. It is able to accept since it recognizes that with a solid starting point we can eventually work out things small and big.

Response 'd' justifies its own acceptance and it is difficult to argue with its self-evident truth. It demands a social dialogue that can be understood. Anything less ultimately fails the test of social acceptability. Response 'e' is very related to the former. It tests acceptability in the crucible of knowability. It invites dialogue that is founded on known things or things that can truly be defined.

The responses for question #3 generally take the context of the collective entity. It demonstrates strong social awareness in the teaching-learning process and in the progress of the dialogue.

4. What is the best representation on paper that we use for "space"? Why?

**RESPONSES:**

- A Cartesian Plane since it is unlimited
- None since paper is 2-dimensional but space is 3-dimensional.
- Cube. Space could easily be inside a cube.
- I believe there is no best representation because it is the set of all points, everything, the universal set.
- the blankness of paper itself ...

Question #4 is an elaboration item. Response 'a' elaborates by invoking previous knowledge. It shows how dialogue is also time-bound. Dialogue happens not only between individuals or between groups but also across time. The student making the response is like conversing with himself as he was in the past. It also demonstrates elaboration by analogy. The Cartesian Plane is infinite as is space. Response 'b' makes a concrete elaboration. It is also an elaboration by showing a counter-example. Responses 'a' and 'b' highlight in the dialogue that which are familiar.

Response 'c' elaborates by what proves to be convenient. The student knows he can draw a cube and propounds on the fact that it contains space inside. Response 'd' elaborates by showing impossibility. That space is everything means it cannot be given a best representation. By downplaying representations it seeks to produce a better elaboration of what space covers.

Response 'e' takes us all to a more philosophical level. It takes us all to a realm higher than mathematics itself. It is such constructs that move forward dialogue and contribute to bigger developments in the field of study. It is an elaboration that is both concrete and metaphysical. Such a response can only enrich the dialogue contributing to the pool of knowledge. The shift in perspective exhibited in response 'e' opens up further possibilities for a more creative and imaginative dialogue.

5. What is your reaction to the following statement ? -- ‘The Undefined Terms are the basic terms in Geometry.’

**RESPONSES:**

- a. I was shocked that a very hard topic would dwell on undefined terms.
- b. This is true and I have no doubts about it.
- c. It is weird.
- d. I was scared. How can I learn advanced stuff if the basic stuff is undefinable ?
- e. Why undefined ? We get them !

The responses to question #5, a reaction item, profiles the possible dispositions of the students at the point of participating in dialogue. Responses ‘a’, ‘c’, and ‘d’ pose potentials for resistance and are veritable stumbling blocks to further dialogue and thus, to learning. The worksheet saved the reaction item for last to highlight, for the teacher, the importance of hurdling such blocks first to effect learning. It is these initial reactions that set the tone for the ensuing dialogue.

Responses ‘b’ and ‘e’ certainly do not lack for the element of courage. It is said that the world belongs to the brave, to those who plod on, to those who take on challenges defined and undefined.

#### 4. CONCLUSION/REFLECTION

The responses presented in this paper cover only a very small fraction of the dialogue that actually happens inside the classroom. Much communication is lost and gets leaked out of the creative/reproductive cycle of knowledge construction. It is the over-riding challenge for the teacher to be aware and to be able to detect these responses, in their varied kinds, when they arise. The task is not easy but is of paramount importance. Understanding the building blocks / undefined terms of Geometry determines and dictates a whole year’s student performance in the course.

The move to have less quizzes and to have more teaching time for the Regular Geometry course is perfectly on the right track. Dialogue

should be emphasized and even more enhanced.

In the framework of social construction of knowledge, everybody gets a chance to participate and to have a stake in the outcomes of the dialogue. An awareness of their own contribution can spur students to perform better.

Belatedly, this research was even more inspired by a reading of Edwin A. Abbott’s literary-mathematical 19<sup>th</sup>-century classic *FLATLAND - A Romance of Many Dimensions*. In it, the main protagonist, aptly named Square, states

Yet I exist in the hope that these memoirs, in some manner, I know not how, may find their way to the minds of humanity in Some Dimension, and may stir up a race of rebels who shall refuse to be confined to limited Dimensionality(p.117).

It is hoped that through dialogue and enhancing student responses, the point, the line, and the plane take us all to higher and higher dimensions.

#### 5. ACKNOWLEDGEMENTS

This is the second humble action research finished in the name of the Geometry Regular Team 2013-14. It is indebted to Mr. Kevin Cordoviz, Mr. Mark Lao, Ms. Jody Lim and Mr. Zoel Masangkay who gave up precious minutes of their class time that could have been used for dialogue to be able to administer the research worksheets. Their classes in Geometry, 3C to 3M, made this paper possible. Ms. Janice Antonio, Mathematics Subject Area Coordinator, is thanked for her support.

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## The Development of Lesson Study Planning in Bahasa Indonesia Subject at GagasCeria Elementary School

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**Abstract:** In Gagasceria Elementary School, lesson study in Bahasa subjects routinely conducted in our school. However, this year we experienced a fairly significant changes in planning of lesson study. The focus previously was a teacher, turned into a student, what the stages of learning that must be passed so that the student could learn objectives achieved? At first, we only discussed about lesson plan that will be held in open lesson. But it was changed as we follow many lesson study that we join at Gagasceria. It affects the way we think for planning our lesson study this semester. If the student has thoroughly studied the content and skill, what new things are learned and will this skill can be used in the future? One of the things that we discussed are steps that need to be passed by the student in order to achieve the goal of learning. The possibility of what will emerge when teachers choose specific teaching materials and skill. This year, we feel that lesson study can make student feel more familiar with the subject learned in the learning process. Language skills of children also have increased quite good. And the teacher also learn how to understand the way of student's mind in order to achieve the learning objectives. We also discuss the possibilities that will occur when teachers choose one method. Lesson study is our event, one of which, the same perception in understanding the purpose of learning with a fun process.

**Keywords:** bahasa; language; skill; series of activities; planning; lesson study

### 1. INTRODUCTION

Lesson study in Gagasceria Elementary school begin in 2009. This is the initiative from the school management to make community learning in school. When we had open lesson, we can share the classroom teaching methodology. But, at first time lesson study focused on the teachers. From there, we learned that lesson study is not merely develop teachers but also improve the quality of learning. We also doubt, was it the way we do already called lesson study. Because of that, we learn from other school about lesson study. This journey directing us to met with many experts in lesson study, so that the quality of lesson in Gagasceria Elementary increased. Lesson study is held in all subjects, one of them is in Bahasa subjects. One of the reason why teacher do lesson study is because the result of assessment discussion at the end of the academic year. We found data that most student still had difficulty in understanding instruction either spoken or written. They unconfident to express their feeling. They also had difficulty to understand others feeling in daily life. This finding could see that children did

not understand about the expression and body gesture from theirs teachers and friends. They only knew if teacher or friend saying their feeling directly.

Before lesson study, we do planning to conduct discussions with the teacher model. This discussion discuss the matter will be delivered as well as a method of teaching. This discussion more toward the form of activities to be done in class. We discussed among other:

- what activities will be conducted by the student
- how teachers assess student
- how the student worksheets form

Doing planning with the former method, actually have not give a positive result. From the post lesson discussion it is also found that student still have difficulty to understand teacher instruction, difficulty understanding about math problem solving text, and text in science subjects.

Then we see method used in the Japanesse lesson study. The method used in that lesson study more focused on the learning, not only focus on the teacher. Since that time, the planning discussion on lesson study in Gagasceria Elementary School transformed. We have to look at the basic

competence from government and than we discussed among others:

- why do they have to achieve the basic competence
- what capability that student has been achieved related to the basic competence
- what capability will the student gain if they has been achieved the basic competence

This is accordance with Tyler theory of lesson study planning whose work is published by John 2006 cited from Lenski & Caskey (2009) on Using the Lesson Study Approach to Plan for Student Learning journal. The research on lesson study can be contextualized in the larger body of lesson planning research. The current thinking that lesson planning is a linear path that begins with a teaching objective is based on Tyler's work, which was published in 1949 (John, 2006). Tyler (1949) proposed that lesson planning should consist of four essential elements: educational purposes or objectives, classroom experiences to attain these purposes, effective organization of the experiences, and determining whether the purposes are attained.

We are concern about planning stages on lesson study to improve teacher competencies and the quality of student achievement. The topic that has been choosen in lesson study not only in literacy aspects but also all aspects of the language. We are trying to develop together through this activity. Lesson study it was not only impact on class who performs open lesson, but also affect school policy related to the use of language. Those policy for instance: the application of cursive writing for all teachers and child (begin from 2nd grade), the application of good and correct bahasa in learning activities to all teachers, and the application of striped sheets of 3 and 5 for a child grade 1 and 2.

Language skills or experience can be trained through habituation during the process of teaching and learning activities. This is accordance with the Uno theory (2010: 22) who explained that learning is a process of efforts by the individual to obtain a change of behavior as the overall experience of individual interact with its environment. Policy regarding the use of language school also in accordance with the Good and Brophy theory (Uno, 2010: 15) it seemed to change patterns on children achievement on new skills in response to its environment, the habit, the attitude of, the ability, knowledge, understanding, emotion, appreciation, physical, ethics, as well as social relationships.

On this paper, we will discuss about the impact of planning stage on lesson study in bahasa class. Focused on 3rd grade in 2012-2013 compared with 2013-2014 academic year. The topic is about imitated dialogue with appropriate expression of the text drama child heard. In this paper, we also discussed about teacher paradigm that change several aspects on teaching learning.

## 2. LESSON STUDY IN BAHASA CLASS

We tried to solve the problem, which has been mentioned before by doing lesson study. The lesson study is not a new thing for us, but we feel there is change by doing lesson study in this year. This happens because there are teachers who are observing lesson study in Japan and experts who are coming to our school.

Through a lesson study, we learned that the planning is very important in the learning preparation. We see the results of the discussion of lesson design another subjects that enforcement succeed in the purpose of learning affected preparation and discussion of planning. Planning of other subjects team, mapped ability that had been owned students in the earlier class or on an activity before. Afterwards, the learning goals of basic competencies mapped in accordance with the ability and skill to be achieved. Students' skill was discussed during a planning, capabilities that have been developed and which still need to be developed in the lesson study activities.

During the learning activities, we also reflect on the teaching and learning activities that have been carried out. Apparently, we also find some Bahasa learning problems that have been discussed previously. Through lesson study, we tried to finish the Bahasa learning problems one by one.

We started the lesson study in this year by planning learning activities more emphasis on students' skill to achieve. Discussions in the Bahasa team is quite dynamic, because we discussed about the content and skill which the student must achieved firstly before the next learning activities. We discussed activities that have been done in the previous class so the next learning goals and activities will be more comprehensive. We also discussed a cycle of activities to achieve the basic competencies, not only do the lesson study activity, but some of activities to achieve basic competence.

One of the planning stage that has been done is on Bahasa class in the third grade. The basic competence that we choose is imitated dialogue with the exact expression of the drama text readability child to hear.

When this basic competence discussed for lesson study activities, discussion of planning preceded the discussion of the basic competencies. Accordingly the basic competencies, we discussed the skills that must be achieved by students when learning these competencies. We make the same perception of the basic competencies in order to achieve the learning goals. Teachers' perceptions differ when reading the basic competencies, which are the students doing taking note when listening to the dialogue because the important thing is the sort of expression that

emerged from the dialogue is heard, students should not be taking note of having to memorize and remember the phrase dialogue, and students get the text of his plays and requested expression appears to sort of dialogue he heard.

From our discussions, we see again the definition of the verb on the basis of competence. Then we concluded that the purpose of learning is that students can express various feelings in accordance with audible dialogue so that students can express themselves in accordance with the current context of drama activities or daily activities. In addition, students know the various expressions that can happen in a social environment.

After that, we discussed a cycle of activities to achieve the basic competencies. Some learning activities in accordance with the basic competencies are knowing a variety of expressions, impersonated a variety of expressions, practice listening dialogue text by using the appropriate expression and intonation.

The results of the discussion planning what we did was the first meeting is the introduction of expression through the video. Second meeting is students listening and imitating dialogue based dialogue audible expression. Expression that will be discussed is angry, happy, sad, scared, and shocked. Students are shown again recording the expression of previous meetings via video. In this activity, students give feedback on yourself or her appearance. Third meeting is an exercise for the portfolio. Fourth meeting is the test portfolio.

We chose to develop the expression of angry, happy, sad, scared, and shocked. Expressions have been used most often in children's daily lives. We sort of 16 expressions are often used in everyday life.

There were changes made over the previous year. Last year, with the same basic competencies, students practice impersonating the expression of Indonesian reading printed books. Then practice the dialogue in pairs to memorize in short conversations. Students are also asked to make a short dialogue about feeling happy, sad, disappointed, angry, and surprised. After that, students practice tests to simulate dialogue heard.

Planning is also changing the way the assessment. Last year, the teacher read the sentence as well as the expected gestures, such as "Wow, see a friend, a cloud shaped like a bear's, beautiful, yes!" (Pointing upward and amazed). Then, students were asked to imitate sentences and gestures of the teacher read. This forms the basis of our thinking when planning a lesson study. Based on these discussions, we also plan assessment in accordance with the basic competencies. Assessment was done by portfolio (portfolio assessment) to demonstrate the skill development of children in imitating a dialogue with the appropriate expression from a reading of the text

of his plays were heard and shows the development of each child process undertaken. Student also participate and perform an assessment of group performance when imitating a dialogue with appropriate expression.

We defined the theme of dialogue that contains a variety of expressions. The theme of dialogue related to daily life so that the students can involve. We also create conversation and dialogue recording containing a variety of expressions that have been introduced to the students.

### 3. CONCLUSIONS

According to lesson study experience at Gagasceria Elementary School, this changing the paradigm of teachers and improve students achievement. This is also an evaluation for teacher to prepare lesson more interesting, make a plan for another lesson with prepared method, prepare the assesment and rubric criteria from the beginning.

The result influence students how to express and understand theirs feeling and other in daily life. In this activity, they show anthusiastism, such as prepare custome and material, try to understand the script, also they gave feed back to one another.

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## The Effectiveness of Teaching Learning Process Through Seating Arrangement, Innovative Teaching Learning Method and Task Distribution in Lesson Study Activity

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**Abstract:** Lesson Study is one of the significant way to improve the teachers quality and professionalism in facilitating the planned teaching learning process. The main goal of teaching learning process in this college is able to produce professional teachers so that the experience that the students got, during the school time, can be taught to their students later when they become a real teacher. However, one thing which is needed to be aware of is the way in managing the teaching learning process, considering that they only got 4-5 years to achieve their S1 degree as well as to learn and practice managing the teaching learning process. Besides, the fact that the teachers graduated from this college are yet satisfying due to the insufficiency of their major and the low quality of the teaching learning process. The findings of the lesson study activity of the economics education department are: 1) seating simulation; 2) innovative teaching learning method; and 3) group work distribution. In conclusion, 1) seating arrangement simulation does affect the teaching learning process especially during the group work discussion, so that the teacher's part in supervising the students' seating position is needed in order to make the students actively expressing their argument in the group discussion; 2) the use of varieties teaching method does affect the teaching learning effectiveness, especially when the teacher explaining the detail of the teaching learning method; and 3) it is needed to have the teacher's instruction during the task distribution for each group so that each student will have the same level of task based on the teacher's instruction and being organized well, this way, each student will have more experience other than only being the group secretary.

**Keywords:** Seating arrangement, innovative method, task distribution.

### 1 INTRODUCTION

In your proceedings paper, don't use any footnotes or endnotes. When you cite a previously published author, do so in the main body of your text. Please follow the *APA Publication Manual* (6th edition) style accurately.

Various problems of education on quality improvement related to supportive elements were done frequently. The need for a new orientation in education was so strong and evident in various aspects and fields of study, both the field of exact sciences and social sciences. Especially in the social sciences tend to be flexible to changes that occur. In response to this, educators and practitioners should be able to respond to changes that occur with the changing paradigm of education. One way to respond to and cope with the changes that occur on an ongoing basis is to implement a variety of innovative learning models, which is expected to boost the quality of the learning process.

Hamalik (2001: 171) states that effective learning is learning that provides opportunities to learn by one self or do activities as possible for the students to learn. The provision of learning opportunities themselves and move broadest expected to assist students in understanding the concepts being studied.

Teaching and learning process is essentially a process of communication, which is a process of delivering a message from the message source through the channel / media messages to specific recipients. The message to be communicated is the content of teaching or education in the curriculum. Source of the message can be lecturers, teachers, students, even the author of the book. The line is the medium of education and the recipient is a student, the student or teacher (Sadiman at all, 2009: 12). According Sadiman at all (2009: 12-13), there are several factors that are a barrier to communication (barriers or noises) that psychological barriers (such as interests, attitudes, opinions, beliefs, intelligence, and knowledge) and physical barriers (such as fatigue, pain, sensory power limitations and disability). Education as a media is one of a learning resource that can deliver a message that helps to overcome it. Because according Sadiman at all (2009: 7), teaching learning media are all that can be used to deliver the message from the sender to the receiver, so as to stimulate thoughts, feelings, concerns, interests and concerns of students so that learning occurs.

STKIP PGRI Pasuruan is a college that emphasizes superior quality improvement for providers of competent teachers in their field, this

way lesson study is the best step that should be done. Similarly, Lesson study is also an assessment of the activity of learning activities, especially about the effectiveness of the learning process. During these times, lectures of Economics Education Department in STKIP PGRI Pasuruan, conventionally taught as the lectures in general, that is by using the method of group discussion on each lecture, which lasted for one semester, this led to the lecturer's disability to know the level of students' mastery after the course takes place.

Economics Education Department deliberately chosen as one of the pilot project for the implementation of lesson study in PGRI STKIP Pasuruan by the reason of activities that occur during the course which can be said to be less successful, given the lectures using the methods already mentioned above, lectures dominated most of the teaching learning process or by a particular student who is usually active in the discussion so that the lecturer is only able to measure the success of learning outcomes in the lecture on a certain amount of students but not the students as a whole. In fact, the main task of the educator is no longer convey knowledge, but rather to cultivate the understanding, guiding learners (students) to learn on their own.

## 2 METHOD

Lesson study activities in economics education department of STKIP PGRI Pasuruan using several methods including, snowball throwing, jigsaw, problem based introduction and quizzes. The subjects in this activity are “Teaching Materials Development”. In developing the course materials, students are expected to be able to make and develop appropriate teaching materials for students of Junior High to High School level, especially in the field of Economics study.

The initial activity began with planning (Plan), which at the planning stage (plan) model lecturer and team designed the teaching learning plan together. The next phase was action (Do) which was intended to implement the lesson plans that were formulated in the previous stage. The model lecturer implemented the plan that has been designed together, while the other team members acted as observers. Other attendees (excluding the members of the plan team) also acted as observers. The next stage was reflection (see), lecturers convey the impression of being a model in teaching, then being observed by the team.

## 3 FINDINGS AND DISCUSSION

The findings in the lesson study activities conducted by the economics education department were: 1) seating arrangements simulation affects the

effectiveness of the learning process, 2) the use of innovative methods affects the effectiveness of the learning process, and 3) the distribution of group assignments affects the effectiveness of the learning process.

The first findings regarding to the effectiveness of the learning process through seating arrangement simulation, the model lecturer discovered a new phenomenon that the effectiveness of the learning process in discussing with less or no circular position is less effective when compared with the group that formed the seat in a circle, because each student in the group which is not circular will be far from each other so that the communication between the students in the group is less effective, and even can cause a passive member of the group. Though the discussion is a scholarly conversation that contains an exchange of opinions is done by some people who joined in the search for truth. In the context of learning the discussion is the way which is done in the study of materials or delivery of material through discussion, with the aim to create an understanding and behavioral change of the student (Naim, 2011: 62).

The second finding was the use of an innovative method greatly affects the effectiveness of the learning process. As the first open class activity of the lesson study can be said to be less successful, it is because the lecturer was less clear in informing about the syntactic method used that the students were confused and did not understand in carrying out the learning activities, considering the students had never experienced activity which the lecturer uses (innovative methods) before. This is proven by the results of reflection (*See* step) in the open class two onwards showed that students in the activities of the learning process were so enthusiastic and enjoy the lectures through group discussion undertaken on each method of learning by the model lecturer. Even students who had appeared relatively passive during lectures (held before the lesson study) can actively and boldly expressed his opinion during the open class activities.

The third findings of seating arrangement simulation settings affects on the distribution of the task group, because students tend to move away from the group discussion or avoid themselves to get involved maximally in a group discussion. So that the students feel involved in the discussions and tend to be in-charge or take over the duties as the minutes. The impact these students will remain passive and can never contribute to the group's opinion. It can also be caused by the model lecturer do not provide information about the distribution of tasks in each group, as well as existing members of the group did not involve the student in question so that the students tend to opt into the minutes. Based on the explanation above, the tasks distribution in a group discussion is greatly needed and could affect on the

effectiveness of the activities in the process of discussion.

#### 4 CONCLUSION

As for the conclusion of implementation of Lesson Study on Economic Education Department of STKIP PGRI Pasuruan, among others are:

1. Seating arrangement simulation greatly affect the effectiveness of the learning process, especially during the group discussion, so the role of the lecturer in supervising the students' attention to the sitting position during the group discussion should be noted, so that all the students are there in the group can both get a chance to contribute and convey arguments on each group discussions.
2. The uses of the varied method greatly influence the effectiveness of learning. In teaching learning activities, teachers should explain in detail about the activities of learning, especially about learning model that will be implemented and syntactic as well. The goal is that students can understand the flow of learning activities to be undertaken and the learning process can run effectively.

The distribution of tasks in each group in the direction of a faculty discussion needs so that every student has the burden of tasks in accordance with the instructions of lecturers and well-organized. So that every student has the same experience-the same argument on the group can provide not only the minutes of the discussions in each group. And it would be better to use notes for lecturers to students that contains the tasks for the students in group discussions.

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## Improving Student’s Writing Skill in the Genre-Based Writing through Process Oriented Approach

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**Abstract:** The objective of this study is to find out, to describe and to develop the appropriate strategy of Process-oriented Approach to improve the writing skill of higher students in the Genre-Based Writing. There are two research questions addressed in the study 1) Have the students applied process-oriented approach in their writing classroom?, 2) How do the students optimize process-oriented approach in their writing classroom? The research design used in this study was classroom action research (CAR) which consisted of four main steps: planning, implementing, observing and reflecting. The procedure of collecting the data was carried out by distributing instruments of the study in the form of test. The data were analyzed by using the framework “Process of Writing”. Based on the data analysis it was found out that mostly the students have applied the process-oriented approach in their writing activity. However, they haven’t applied it optimally. In addition, the students have done a lot of correction in stage of revising. The findings of the study should that the implementation of the strategy of Process-oriented in improving students writing skills in the genre-based writing, classically, was high. Finally, the pedagogical implication of the study is the students are supposed to fully motivated that writing activities can be very easily done if they apply the process-oriented approach. The approach, moreover, is applicable to improve students’ final product.

**Keywords:** *writing skill, teaching writing, genre-based, process oriented approach*

### 1 INTRODUCTION

Writing is considered as the most difficult and complicated language skill to learn compared to other language skills (Widiati & Cahyono, 2006:139), the common complaint of the teaching of writing is that the class of writing is boring. Most of the students think that writing is not only difficult subject but also stressful subject. The students of academy level usually learn writing subject in three different level, namely: sentence-based Writing, paragraph-based writing and genre-based writing. Each level has its own competence that must be mastered by the students at the end of the learning process. Richard in Widodo (2007) mentioned that there are four activities that can be implemented in the class of writing:

- 1) Familiarization. It is an activity in which the students learn the grammar and the vocabularies through a text.
- 2) Controlled writing. It is an activity in which the students
- 3) Guided writing. It is an activity which the students join the existing model of the text

- 4) Free writing. It is an activity that the students create their own essay.

Today, a growing issue has already increased in the process of teaching writing for the students at academy level. The issues stated that the students are demotivated when they are asked to write and their writing results are very poor compared to other skills they have. In order to minimize the problems of teaching writing, Raimes in Richard (2003:45) suggests the teachers to help the students write a meaningful piece of writing and eliminate the complexities of writing activity. Additionally the teachers need to develop their techniques in the teaching of writing, the teachers should provide a strategy of how they think writing is learned. Teachers of English should attempt to provide learners with opportunities to express their ideas in a written form which the students can formulate their ideas, choose the right words, join the sentences in the right order, arrange the sentences coherently and cohesively and finally they can create their perfect writing. Many researchers have already developed several approaches to be applied in the

writing class to give an interesting and different experience for the students. Thus, an alternative approach of process oriented approach would be implemented in the process of teaching writing. The process oriented approach, based on the writer's experienced, gave good contributions to the students achievement of writing because it would involved three steps of writing, as follows responding, evaluation and writing. Those three steps are considered as the key of the process oriented approach to improve the students' writing skill. Students were trained to think and write systematically and critically. Moreover, the process oriented approach in writing would help the students to be independent writers of texts as they are eager to find ideas and create the ideas into a good writing and they could solve their problems in writing class.

## 2 REVIEW OF RELATED LITERATURE

Writing is multivarious process. Harmer (2004: 69) said that writing is such a classy skill mingling a quantity of diverse fundamentals that necessitate not only grammatical and rhetorical features. In addition, Mochtar (2004: 58) argues that in language learning, writing is claimed more complicated and integrated than other language skills: listening, speaking, and reading. Brown (2001: 219) added that writing skill obliged not only an aptitude of a writer to correspond with a reader, but also to interpret ideas into language. Writer ought to have a capacity to construct a series of sentences in particular order and link together in certain ways. Halliday (in Nunan, 1999:132) explained that written language is used for the following purposes: (a) for action (e.g: public signs, product labels, television and radio guides, bills, menus, telephone directories, ballot papers, cumputer manuals) and (b) for information (e.g: newspapers, current affairs magazines, advertisements, political pamphlets).

### 2.1 Process Oriented Approach

Murray in Montague (1995) described that process oriented approach refers to a teaching approach that focuses on the process a writer engages in when constructing meaning. This teaching approach concludes with editing as a final stage in text creation rather than an initial one as in a product oriented approach. The process oriented approach may include identified stages of the writing process such as: pre-writing, writing and re-writing. Once the rough draft has been created, it is polished into

subsequent draft with the assistance of peer and teacher conferencing. Final editing and publication can follow if the author chooses to publish their writing.

Process-oriented approaches concern the process of how ideas are developed and formulated in writing. Writing is considered as a process through which meaning is created. This approach characterized writing as following a number of processes: first, a writer starts writing ideas as drafts. Subsequently, he or she will check to know whether the writing and the sentence organization makes sense to him or her or not. Then, the writer checks his or her writing to make sure whether it is clear to the reader. More, Nunan (2001) stated that process approach focuses on how clearly and efficiently a student can express and organize his ideas, not on correctness of form. Students are first asked to go through such writing processes, trying organize and expressing their ideas clearly. The assumption is that what the student as a writer is going to say will become clearer through these processes.

### 2.2 Process of Writing

Meyers (2005:2) uttered that writing can be interpreted as a process of finding an idea, formulating the idea and arranging the idea into a piece of writing then writing it on the paper. Writing can be said to be the same as talking in searching the ideas or topics then communicating through it. However, there are many different things between writing and speaking, such as: when communicating through writing we cannot directly see and hear the response from the hearers or readers so we have to imagine what the reactions given by the readers. We have to choose a topic of interest to the reader and present it in an interesting way as well. We also have to present these ideas in a logical and sequential. In the end we have to read our own writing to be able to fix it until we truly believe we can convey those ideas clearly. A good writing can convey ideas clearly and it must be done through several stages.

Harmer (2004: 4-5) divides into four stages, namely planning writing, drafting, editing (reflecting and revising), and the final version. The stages of the writing process by Harmer called The Wheel Process. Meyers (2005: 3) classify writing into six stages, namely stage 1). Explore ideas (consider the subject, consider the purpose, and consider the audience), 2). Pre-write (brainstorming, clustering, freewriting), 3). Organize (select, outline), 4). Write a first draft (write quickly intervening to record your



thoughts, put notes and new ideas in the margins), 5). Revise the draft (read it aloud, add or omit materials, and move materials around), 6). Produce the final copy (edit, print or copy over a clean copy, read carefully for errors, and then the make another clean copy).



Figure 1. The Wheel Process (Harmer 2004:6)

Seow (2002: 315) cited by Widodo (2007: 118) categorize the stages of writing as follows 1) Activated Process, 2). Planning, 3). Drafting, 4). Revising, 5). Editing, 6) Process Terminated. Hyland (2003)formulates the following stages of the writing process 1). Planning, 2). Drafting, 3). Peer / Tutor Review, 4). Revising, 5). Editing.

Oshima and Hogue (1998: 3-14) recommends three steps in writing: 1). Prewriting (Choosing and Narrowing the topic, and brainstorming (listing, clustering, freewriting), 2). Planning / Outlining (Making sublists, Writing the Topic Sentence, Outlining), 3). Writing and revising Drafts (Writing the First Rough Draft, revising Content and Organization, Proofreading the Second Draft, Writing the Final Copy).

### 2.3 Teaching Writing in Genre-based Approach

The most important reason for teaching writing is that it is a basic language skill, just as important as listening, speaking, and reading. Harmer (2000:98) said that writing activity can also improve the learners' language development. Language learners need to know how to write letters, how to put written report together, how to reply to advertisements, etc. The language learners also need to know some of writing conventions such as phrase based, sentence based, paragraphs construction, text constructions, spelling, capitalization, punctuation, coherence, cohesion, etc. Moreover, Gebhard (2000:132) explained whether it is generally agreed that the beginning EFL students need to learn the basic conventions of writing that include the ability to identify and write down letters, words, and simple sentences as well as to learn the spelling and punctuation convention. The development of teaching writing for the students of academy level has already changed from free writing into genre-based writing. Genre based writing focuses on

developing the student's skill or writing starting from a topic till a complete essay which regards on social function, schematic structure and lexicogrammatical features of the written text they make. Gerot & Wignell (1994:192) said that recall that genres are staged, goal-directed and purposeful. Thus for any text we can ask: 1) what is its social purpose or function and goal?, 2) through what stages does it achieve that goal?, 3) what lexicogrammatical and discourse choices are involved in the above? More, Gerot & Wignell (1994:192-223) mentioned that there are fourteen kinds of texts in the genre based. They are spoof, recounts, reports, analytical exposition, news item, anecdote, narrative, procedure, description, hortatory exposition, explanation, discussion, reviews and commentary. In addition Hyland (2004:5) proposed the four stages in teaching writing, namely building knowledge of the field (BkoF), modelling of text (MoT), joint construction of text (JcoT) and independent construction of text (IcoT).

### 3 RESEARCH METHOD

The research design applied in this study is classroom action research. It is a practical study that used to increase the quality of teaching learning activity. Burns (2010:2) defines action research as the study of a social situation with a view to improving the quality of action within it. It aims to feed practical judgement in concrete situation. The study conducted at one of private colleges in the level of diploma three program in Semarang, Indonesia. The subject of the research was 25 students who took writing class in the academic year of 2013/2014. The data of this study were the students' writing of only six different texts narrative, recount, descriptive, report, analytical exposition and hortatory exposition.

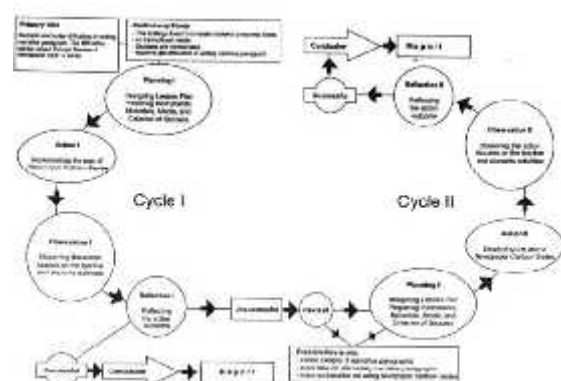


Figure 2 The Cycle's Picture of the research design

#### 4 RESEARCH FINDINGS

The situation in the classroom during the teaching learning process before the use of process oriented approach in writing texts was fed up. It happened because the students had low motivation, they did not have any positive attitude, feeling or even their thought. Almost all students looked confused with what they had to learn. Particularly when they had to construct a text based on its genre, they had to work hard since they only had a topic to be developed. The findings were attained from the optimizing of process oriented approach in the genre-based writing class. The process oriented approach helps the students to gather the ideas during the prewriting stage. By using this approach, it is expected to improve the teaching learning process and to achieve good score on the content quality in writing some texts. Hence, the focus of this study is on the writing pre-process. This division comes with findings of the action of cycle I related to the optimizing of process oriented approach to improve the content quality of the students' composition in writing texts. The findings present the research procedures: planning the action, observing the implementation of the action, and reflecting the results of the observation. Furthermore, the findings analyze the students' writing achievement, the teaching and learning process and the result of cycle I and cycle II.

The finding of this study was 85 students' writing from 6 different texts of narrative, recount, descriptive, report, analytical exposition and hortatory exposition. There were 10 students who wrote all the texts completely, 7 students who wrote 5 different texts, 3 students wrote 3 kinds of texts, and 2 students wrote 2 kinds of texts. In general, the findings of the students writing were 17 narrative, 18 recount, 13 descriptive, 19 reports, 18 analytical exposition and 14 hortatory exposition.

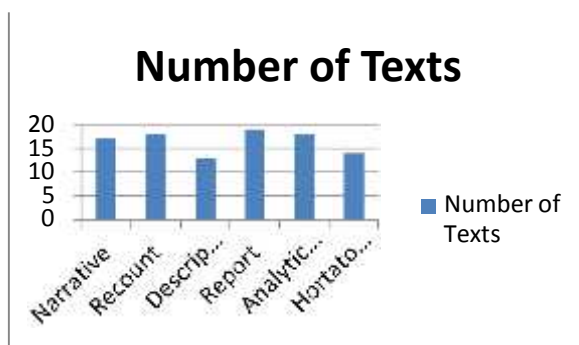


Table 1 The result of the students' writing

From the cycle I, the findings presented three stages of the writing process. First stage, prewriting was done by two steps: choosing and narrowing the topic and brainstorming by giving an activity of

listing, freewriting, and clustering. Through this step the students enjoyed using the first step of choosing and narrowing the topic of 12 different texts. It was about 10.44%. For the second step, the students used listing of 53 texts (46.11%) and clustering 4 texts (3.48%). And the rest of the students did not use the steps but went directly to write rough draft and final product of texts.

The second stage, planning (outlining), the writer used three steps: making sublists, writing the topic sentence and outlining. From the data taken, it can be concluded that about 62 texts (53.94%) applied outlining when writing the text.

The third stage, writing and revising drafts used the three steps of writing the first rough draft, revising content and organization and revising sentence structure, grammar, mechanics and vocabulary. From this stage, it was found 54 texts (46.98%).

From the cycle II, the findings presented three stages of the writing process. First stage, prewriting was done by two steps: choosing and narrowing the topic and brainstorming by giving an activity of listing, freewriting, and clustering. Through this step the students enjoyed using the first step of choosing and narrowing the topic of 25 different texts. It was about 28.73%. For the second step, the students used listing of 60 texts (68.96%) and clustering 2 texts (2.29%). And the rest of the students did not use the steps but went directly to write rough draft and final product of texts.

The second stage, planning (outlining), the writer used three steps: making sublists, writing the topic sentence and outlining. From the data taken, it can be concluded that about 69 texts (79.31%) applied outlining when writing the text.

The third stage, writing and revising drafts used the three steps of writing the first rough draft, revising content and organization and revising sentence structure, grammar, mechanics and vocabulary. From this stage, it was found 62 texts (71.26%).

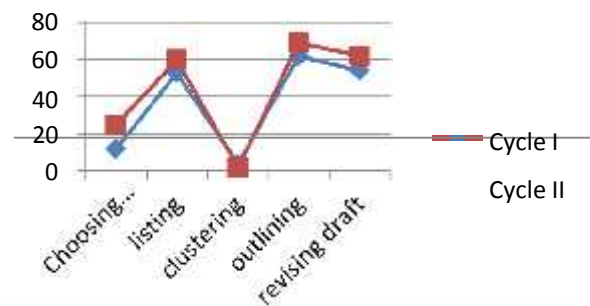


Table 2 The result of the writing cycles

From the results above, the writer found the optimizing of the process oriented approach improved the student's writing quality, particularly in writing genre. The students used their knowledge in brainstorming activity to find an idea then write it into a text. Here is the students activity in brainstorming activity.

*Genre: Narrative*

*Topic: motorcycle accident*

*Brainstorming (listing): went back, accident, looking for a gas station, call friend, etc.*

*Genre: Description*

*Topic: My House*

*Brainstorming: traditional, main room, paint, small town, dining room, kitchen, bedroom, bathroom, television set, etc.*

While in the outlining activity, the students wrote:

*Genre: Description*

*Topic: My House*

*Outlining:*

*Identification (Par 1)*

*TS: I live in a traditional house located in a small village in east Jepara, the place where RA Kartini was born in.*

- a. trees surrounding
- b. fresh air

*Description (Par 2)*

*TS: The house is a small one painted in grey.*

- a. Main room
- b. Praying room
- c. Bedroom for the guest

*Description (Par 3)*

*TS: In the main room there is a way to the dining room behind it.*

- a. surrounded by 3 bedroom.
- b. kitchen beside it
- c. bathroom
- d. garage

*Description (Par 4)*

*TS: Actually, the house is the same house where my grandmother and grandfather lived long time ago. It's still like it was..*

The student's writing of outline activity in writing description can be seen from the following example:

*Genre: Description*

*Topic: My house*

*Outlining:*

*My house is really comfortable  
My house is small  
It is surrounded by wide ricefields*

*There is a little garden with some beautiful flowers*

*There are 3 bedrooms*

*There are a kitchen, a bathroom, a main room, and a family room*

*It is painted in blue*

*We endure to stay here*

In the revising draft, the students did the peer editing with the lecturer's help. They tried to correct the diction, grammar, vocabulary and linguistic features, as the examples of:

1. Changing or rearranging ideas in first drafts is very practice: *practical*.
2. A frog said to her that her wish would be come true: *would come*.
3. The frog promissed that before a year had passed she would have a baby: *promised*
4. One day there was a man, just called him Nick: *call*
5. His feeling to loved somebody is very complicated: *to love*
6. B e c a u s e i t ' s v e r y e a s y t o d o a n d m o r e e f f e c t i v e t h a n a n o t h e r .  
*It's very easier to do and more effective than another.*

1. It is very easy to change and rearrange ideas in first draft and revising the writing: *revise*
2. She worked with producers Paul Higgins and Trevor Carter on thirteen tracks for an album called Delta, which saw "an ambitious 15-year-old keen to emulate the pop sound of the Spice Girls, Britney Spears and Mandy Moore".  
The words *called* and *saw* were identified as Material Processes however the word *called* belongs to Verbal Process and *saw* Mental Process.
3. He could not control his mad. : *madness*
4. They found their mother and talked her about it. : *told*
5. The second stage of Hyde's solo career started off with the 'HELLO' single that was released on June 2003. : *be of passive voice 'was'*
6. In 1996, she was the cover girl of Gadis, a teen magazine in Indonesia after that Dian started here career on the big screen with a starring role in the box office hit in Malaysia and Indonesia, the movie called AADC. : *After that*
7. Amir Hasan followed by his mate went to Karimunjava island. : *was followed – go*

## 5 CONCLUSIONS

Writing process oriented approach keeps the students free to generate the ideas and to organize texts. This approach gives the students opportunity to experience meaningful interaction to share and communicate their ideas or thoughts and the optimizing of the genre-based writing through the process oriented approach implemented in this study has a positive impact on the improvement of the students' writing texts. In writing activities, the learners experience how to generate ideas, write draft, revise them and edit the final composition. Sharing needs, abilities, and learning experience in peer editing activity improve the learner's self confidence and encourages them to learn and apply their knowledge of language. Facilitating the students to work together takes some of their own learning decision to accomplish the task. The consequence is that it enhances the student's motivation in learning writing.

The teaching of genre based writing through process oriented approach is more meaningful and interesting when it is well-arranged through the four stages of Wheel process. Lesson plans or teaching scenarios are arranged in such a way that the teachers and the learners reflect the optimizing of the oriented approach. Self-access learning is admitted for writing genre based texts independently and personal treatment is expected to be given to the students for it minimizes the gap between teacher and students.

The students are recommended that they practice writing genre texts in various topics by optimizing the process oriented approach because it has been proven in this study that the approach inspire the students to generate their ideas and have brought them to organize the texts.

## 6 ACKNOWLEDGEMENTS

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## Improving Critical Thinking Skills and Student Learning Outcomes in The Public Economics Courses by Using Problem Based Learning Model Approach

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**Abstract:** Based on his observation in the class be known that the critical thinking skills of student still classified as low. It was caused by a student not bold in pour their ideas on the discussion in class. So that by the application of the problem based learning (PBL) is expected to make public economics courses more easily accepted and understood by a student. Research aims to improve the critical thinking skills of students and the level of mastery learning student's in public economics courses with the implementation of economic approach problem based learning in learning public economics courses. Methods used in this research are classroom action research with a model the problem based learning (PBL). In its application using two cycles of learning. A research result of the application of the problem based learning (PBL) is that the critical thinking skills of students in each meeting has increased from cycle I to cycle II. Learning outcomes of the students has increased productivity of 69,2 % in cycles I into 84,6 % in cycles II.

**Keywords:** Problem based learning, critical thinking skills, learning outcomes.

### 1 INTRODUCTION

Developments in science and technology (Science and Technology) are rapid and dynamic changes in society that makes the world of education should automatically evolve in line with advances in science and technology. The success of a nation is no longer dependent on natural resources and physical capital, but depending on the quality of Human Resources, which will eventually make a nation will be honoured and respected by other nations.

Along with the need for qualified human resources, which must be drawn is a quality education as well. In getting a good education then it takes a good learning process as well. Learning can be effective when all components are mutually supportive effect. These components include: students, curriculum, faculty, methods, facilities and infrastructure and the environment.

Students have an important role in the education and development as an agent of change for the study practiced, so they are expected to follow the progress of science and technology as well as productive in the community. Education continue to evolve with advances in information technology are increasingly sophisticated. Rapid technological progress also has implications for the students to gather information from a variety of disciplines. This concept is in accordance with the current curriculum that requires students to learn independently find their own concept of a material being studied. In the process of

teaching and learning teachers hold an important role, but the teachers here only act as a facilitator rather than as a learning centre or main actor in learning activities.

The use of lecture method pulpit or better known as the lecture method which has been used in teaching subjects deemed Public Economics is no longer appropriate and less in accordance with the basic competencies that must be mastered students in the course. According to some research results on the use of the lecture method pulpit or lecture (Suyanto, 1998) indicate that the lecture method is effective for conveying information, but not effective (1) to involve students actively in lectures, (2) less provide meaningful learning experiences for students , and (3) is not effective in improving student learning. Meanwhile, according to Percival & Ellington (1984) full attention in learning the lecture method in the range of attention (attention span) progressively decreased.

Public Economics is one of the courses provided to students in semester Economic Education 6 (six). Public Economics courses studying government policy to economic problems in Indonesia. Therefore, in the course of learning Indonesian economy should be more interesting and challenging so that later can be applied in the real world.

One of the learning model is a model that can be used Problem Based Learning (Problem Based Learning / PBL) has the following characteristics: ask a question or problem, focusing on the linkages

between disciplines, authentic investigation, produce a product / work and show it off, and cooperation. While the main goal the development of PBL is to develop thinking skills, problem solving, and intellectual skills, learning a variety of roles through their involvement in a real or simulated experience and become autonomous and independent learners.

As a lecturer of Public Economics courses should always seek, study and develop models of teaching in accordance with the characteristics and competencies that must be dominated students in the course of teaching. Failure or lack of achievement of the objectives of courses is not solely due to shortage / abilities of students, but lecturer should introspect on what has been given, the learning model is not appropriate, the conditions are less conducive classroom, lack of teaching materials available, faculty teaching behaviours that tend instructive, and evaluation system does not describe all aspects of intellectual, social and affective student is an indicator of lack learning objectives that should be corrected by the lecturer of the course.

Based on public economic exposure to the above learning with PBL approach aims: first to describe the application of learning strategies through problem based learning model (PBL) on the subject of Public Economics. The second to determine the feasibility model of problem-based learning (PBL) in Public Economics courses can improve students' critical thinking skills in terms of: express the problems, analyze problem, and provide alternative solutions to the problem. Third to describe the learning outcomes of students after following the model of the problem based learning (PBL) on the subject of Public Economics.

The results of the study Scott (2014) Findings affirm the importance of problem design characteristics and effective team facilitation, while raising new questions about team-level characteristics such as goal orientation diversity.

According Kurniawan (2013) Implementation Problem Based Instruction (PBI) is student activities at each meeting have a significant escalation. The level of completeness student's learning outcome at validity and reliability of items substance have a significant escalation from 71.43% in the first cycle to 85.71% in the second cycle, then increased to 92.86% on the posttest.

Research Muhson (2009) Findings showed that the implementation of the PBL method was able to increase the students' learning interests both inside and outside the class. By way of case analysis tasks, students showed great participation in the teaching learning process. The PBL method also increased the students' achievement. The students showed great understanding of the concepts and application of advanced statistics.

Marpaung (2005) that learning biology with problem-based learning activity sheets (LKPBM) as an alternative assessment can improve critical thinking skills that can contribute to the formulation of indicators of critical thinking that is the problem, argument, deduction, induction and decide the issue, and can improve learning outcomes that have positive influence on cognitive level.

According research Bilgin, et al (2009) The analysis of results showed that students in experimental group had better performance on conceptual problems while there was no difference in students' performances of quantitatives problems. The results of the study are discussed in terms of the effect of PBL on students' conceptual Learning.

## 2 RESEARCH METHODS

Type of research is Classroom Action Research (Classroom Action Research) (Hopkins, 1993: 48), which is oriented to the quality of learning (improvement-oriented instruction). While the subject of Public Economics course, because in the course many students are less sensitive and critical to the economic problems of the public in Indonesia.

According to Kemmis and Mc Taggart (1998), action research procedures in the classroom, including: plan of action, action research, observation, reflection, and re-planning.

This research was conducted in the Department of Economic Education class of 2011 odd semester 2013/2014 the Faculty of Economics, University of Surabaya, the number of students by 28 people. Selection of subjects was based on the results of preliminary observations that the students in the class are less active and critical in class so based on feedback from peers, then the class chosen as research subjects.

The data in this study were collected by means of observation. The data collected is based on the ongoing process of public economy in classroom learning. The things that are important and interesting note relating to the formulation and research purposes. Observations done twice, in the first cycle and the second cycle. in this study, the researcher acted as a dam involved teaching and learning full by observer peer.

Analysis of the data in this study make use of qualitative, namely the exposure data in accordance with the findings of the field is expressed in verbal statements. in this study data analysis is done by observing the following guidelines: (1) to determine the application of learning strategies through problem based learning model (PBL) on the subject of Public Economics is the attainment of action if the data lecturer in implementing measures of problem-based learning model (problem based learning) reached an average of 3 or with either category. (2) to

determine the feasibility model of problem-based learning (PBL) in Public Economics courses can improve students' critical thinking skills in terms of: suggested problems, analyzing problems, and provide alternative solutions to the problem is the data in the achievement of student problem-solving skills to reach the average 3 between the classifications or categories of 'good'. (3) to describe the learning outcomes of students after following the model of the problem based learning (PBL) in Public Economics courses are student learning outcomes achieved if the rate of at least 75% mastery learning with classical completeness level of 80% in one class.

### 3 RESULT

#### 3.1. Cycle 1

In cycle 1 at the first meeting, which is used as a general reference is the lesson plan that is supported by the observation instrument and learning the instrument.

The description of the first meeting of the first cycle is as follows:

##### Early Stage Events

Early stages of the activities carried out during the first 10 minutes. Deliver learning activities begins with the basic competencies and motivate students with the theme "economic problems in Indonesia". Furthermore, asking questions to the students about how the economic conditions around you. By motivating students to know the importance of the economic problems that can be overcome or provide ideas for future improvements.

##### Phase Core Activities

The next steps carried out for 70 min to do were explain the problem of government in the economy. In any explanation of each part of the theory was used along with examples of problems that can be applied in the analysis or interpretation and students to facilitate student understanding.

Furthermore, the students were divided into 6 groups of 4-5 students per group. Lecturers give a case study to each group to break with his group and the last student to present the results of their discussions to other groups responded to another group.

#### Final Stage Events

After the discussion was completed, the results of discussions with students all recapitulated. After that, the students are given the opportunity to ask about some of the things that becomes their problem in the implementation of the discussion. Furthermore, the results of the discussion were concluded. Students are given the task to create a policy related to the problem as it exists in Indonesia with existing case studies and presented at the next meeting. Furthermore, the rest of the time is used to perform the test cycle 1.

#### 3.2. Cycle 2

In this second cycle, learning mixed a little different than the first cycle. It is based on the observations on the first cycle. The first thing to do is to link the material economic and policy issues associated with the existing problems.

##### 3.2.1. Early Stage Events

Learning activities initiated by getting the students to observe the current Indonesian economic conditions. Further described behold the economic activity generated a lot of problems (10 minutes).

##### 3.2.2. Phase Core Activities

The next steps are performed to prepare students analytical results related to government policies to address the economic problems of Indonesia. Once ready, then students presented the results of the analysis and the problems that arise for other groups to be discussed and solved together.

##### 3.2.3. Final Stage Events

After the discussion is completed, the results of discussions with students all recapitulated. After that, the students are given the opportunity to ask about some of the things that becomes their problem in the implementation of the discussion. Furthermore, the results of the discussion were concluded based on the various existing findings. Thus, what they have learned helpful for them. Furthermore, the rest of the time was used to perform the test cycle 2.

### 4 DISCUSSION

Observation of the critical thinking skills of students performed in each execution cycle. Observed student activity includes activities carried out during the discussion.



Based on observations, it can be concluded that an increase in students' critical thinking skills significantly. In the first cycle of the average critical thinking skills is relatively low, while for the cycle to two significant increases especially aspects make a decision. Overall critical thinking skills in the first cycle is still relatively high when compared with the first cycle, this is because students in the field after observing them more aware of the condition of the field so that when the discussion in their classes easier in describing the findings of the field. From the results of these observations were also seen an average of almost all the aspects already shown good results or have the ability to think critically high. For group one aspect of evaluating and do action was quite good with a value close to 4, but to perform deduction and induction aspect is still low. While group 3 has a value that is relatively stable compared with other groups. This could be due to students enthusiastic in answering or presentation in front of the other groups because of the topics covered in accordance with the task later if becoming a teacher. The high percentage of students showed high activity, so that the discussion seemed more alive and active.

While the average assessment of students' critical thinking skills to decide which aspects of the number 6 and execute both in cycle 1 and 2 show high scores. Through these diagrams can be seen that an increase in the value of the overall performance of students in critical thinking skills.

Based on observations, an increase in the level of mastery learning students from the first cycle to the second cycle, an increase in the level of mastery learning classical from 69.2% in the first cycle to 84.6% in the second cycle.

The increase in the classical mastery learning from the first cycle to the second cycle due to a matter of the second cycle of evaluation is based on student worksheets that have been discussed with the faculty and students. While the completeness repairs class on the second cycle due to the time allocation is adjusted to the complexity of the matter.

Based on the presentation of research data that has been presented in this section, the discussion will be presented the results of research that has been done, as follows:

#### 4.1 Cycle 1

The main obstacle is the difficulty faced by observation of student performance activities. This is due to the number of students is too much. Therefore, the observation is only intended to ten randomly selected students.

In addition, problems or other obstacles that appear in the first cycle can be identified as follows:

(1) Students are not accustomed to think of scientific study and solve the problems contained in the Student Activity Sheet. (2) In a joint discussion, students are not accustomed to express his opinion individually. (3) The sound is relatively less audible researchers.

To overcome these constraints, efforts were made, among others: (2) provide positive reinforcement to students. It is expected that with the positive reinforcement can improve student confidence. (2) in the next cycle, the lecturer took the initiative to be in the middle of the student so that teachers can reach out to the sound of the whole class.

#### 4.2 Cycle 2

In the implementation of the second cycle, the relative constraints do not appear significant. So that the learning process run more effectively and efficiently. This condition is caused because students are better prepared and conditioned to accept the material. In addition, students are also no longer awkward or more dare to express their opinions.

In observation of student performance activities are also selected ten students at random. Progress has been achieved in the second cycle are as follows: (1) Students have been able to develop their own scientific way of thinking and construct their own understanding. (2) The participation of students in the higher learning process. (3) Students have been able to express their views in discussion with the individual. The discussions became more evenly shared and not dominated by a particular group.

### 5 CONCLUSIONS

Based on the analysis of data derived from observations of the management of learning, critical thinking skills of students, student response, and student learning outcomes, it can be concluded some of the following: (1) the application of Problem Based Learning (PBL) in public economics courses, particularly on the material Indonesia's economic problems can generally be run as planned. Some of the barriers that exist can be corrected in the next round. (2) This approach can improve students' critical thinking skills. (3) the results of the study experienced a significant increase of 69.2% in the first cycle to 84.6% in the second cycle.

Based on the findings in the field can be suggested to faculty to use problem-based learning by taking into account aspects that need especially attention and which are not. Thus of gaining good results and correct. The study was conducted in a material with a limited use of the strategy. Therefore, other researchers are expected to be more varied in

applying learning strategies in order to show the important things that cannot be shown in this research.

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## An Action Research Study on using Elegant Tasks for Primary One pupils to Learn Art

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**Abstract:** This action research study explored the use of Elegant Tasks for thirty primary one pupils from a typical public school in Singapore to learn Art. According to Sandra Kay, an elegant task is an open-ended-problem approach that serves to elicit ‘creative thoughts’ and ‘elegant’ or ‘aesthetically meaningful’ solutions from pupils. Apart from making the teaching of art interesting, the use of Elegant Tasks helps to amuse the pupils into developing an awareness of his or her own style of thinking including, its strong points as well as its weaknesses. Qualitative data were collected through focus group discussions. The findings from this study showed that pupils like the adoption of Elegant Tasks in their art lessons as they were given enough room to explore materials, make new discoveries, and work collaboratively in groups. Besides, this approach has also developed a strong sense of ownership and pride in their artworks as witnessed from pupils’ presentation of their artworks at the end of each elegant task topic.

**Keywords:** Art, Action Research, Education, Elegant Task

### 1 INTRODUCTION

I have been a Primary School Art teacher for many years. Prior to this research study, I taught Art to my pupils in the same manner that I was taught this subject when I was a primary school pupil. The strategy that I had adopted all these years was a teacher-centred, product-driven approach in which I provided all the required information, instructions, demonstrations, samples and followed by my pupils’ production of artworks. Hence, my pupils learnt Art merely through imitating the samples that I had prepared prior to the lessons.

However, as witnessed in the past Art lessons, pupils listened passively to me while I imparted my knowledge. Although the majority of pupils were able to produce impressive and eye-catching artworks by imitating my styles, colours and methods shown in the samples, I found that their artworks lacked creativity, imagination, emotion and personal voices. In addition, they neither demonstrated ownership of nor pride in their artworks. I also observed that over time, most of my pupils became disengaged during the Art lessons as they were not required to actively participate in the process of ideation and art-making. A few of them even became restless and caused unwanted disruptions in class.

These observations of my pupils’ lack of interest in learning Art and the disruptive behaviours of some of them raised concern and this in turn led me to reflect on and question my own instructional strategies in class. I had asked myself why I was still using the one-mould-fits-all strategy to teach the children despite my cognizance that all children are different, and they love to express themselves and to learn new drawing techniques and skills from their Art teachers. I had also asked myself whether there was a better way to teach art as well as to nurture a child’s creative development. This soul searching gave rise to the conviction that there must be better ways to teach Art and to develop the artist within each child. Fueled by this conviction, I decided to embark on this action research journey with a view of exploring a pupil-centered pedagogy that can offer a beneficial impact on teaching art.

This research study was conducted through a series of five Action Research Cycles with each cycle that alternated between action and critical reflection. As pointed by Dick (2001), Action Research (AR) is both a change methodology and a research methodology within a single process. In this research study, AR has helped to bring about change or improvement (the action) in such a way that better understanding was developed as parallel outcome at

hand. AR also assisted the teacher to pursue understanding (the research) that allowed the action to be based upon a better understanding of the current situation and the research was achieved by being responsive to the situation and by searching strenuously for disconfirming evidence.

## **2 ACTION RESEARCH CYCLE ONE: DERIVATION OF RESEARCH QUESTIONS**

While searching for a pupil-centred pedagogy, I was introduced to “Elegant Task” approach by one of the officers from STAR (Singapore Teachers’ Academy for the aRts) during an Art Workshop in February 2013. During the workshop, I learnt ways of designing art lessons that focused on pupils’ creativity and imagination using Elegant Task. This approach also allows pupils to explore materials and participate actively in the art-making process. After learning about this new approach, I was eager to find an opportunity to try it out on my pupils.

During my first consultation session with STAR officers in May 2013 for my Action Research study project, we brainstormed a few possible pupil-centred methodologies suitable to be used for this study, such as Inquiry-based approach, Experiential Learning approach and Elegant Task approach. After debating on the pros and cons of each method, we came to a unanimous consensus that Elegant Task approach was more suitable for this study as it was a relatively new approach which had not been used or tested in a Primary School in Singapore before and it also fulfilled the criteria of being a pupil-centric, process-driven approach that could develop pupils’ creativity and imagination. By using Elegant Tasks to teach Art, my pupils would have opportunities to make choices and decisions in the ideation stage and during the art-making process. The choice of using Elegant Tasks was subsequently adopted for my Art lessons and simultaneously I embarked on my research project. Hence, for the research, the broad question that my study addressed was: “What are the Primary 1 pupils’ perceptions on the use of Elegant Tasks in Art lessons?”

Beside the broad research question, we also crafted six specific questions to guide my inquiry and to enable me to collect data to answer the broad research question. The STAR officers helped me to scope my research area into three broad themes, firstly, we wanted to find out whether the pupils liked the Elegant Task approach, secondly, we wanted to find out what pupils actually learned if I use Elegant Task approach in Art lessons, and lastly, we wanted to find out whether Elegant Task approach helped the pupils to produce quality artworks. With these three themes in mind, we further broke down each theme into six manageable bite-size questions. These six

specific questions were later used during the focus group discussions to collect data.

The six specific questions were as follows:

1. Do the pupils like the Elegant Tasks approach to learning Art and doing artwork? If yes/no, why?
2. Give an example of an Elegant Task Art lesson which the pupils liked and disliked. Which parts of the lessons do they like/dislike and why do they like/dislike those parts?
3. What can the pupils learn about art-marking when Elegant Tasks are deployed?
4. Apart from art-making, what else can the pupils learn during the Elegant Task Art lessons?
5. Can the Elegant Task approach help the pupils to produce quality artworks? If yes, in what ways? If no, why?
6. What else can be done to enhance the Art lessons? Can the lessons be improved based on pupils’ feedback at the end of each elegant task?

## **3 ACTION RESEARCH CYCLE TWO: CONDUCT LITERATURE REVIEW**

In this action research cycle, the findings of literature review are presented in three different sections. The first section, “the 2009 Primary and Lower Secondary Art Syllabus and its influence on the teaching of Art”, describes the syllabus set by authority. The second section, “Elegant Tasks, its characteristics and its effect”, describes an elegant task and how an elegant task can meet the learning objectives mentioned in section one. The third section, “understanding the different types of learning dimensions in learners and their stages of artistic development”, provides a set of pointers for designing a lesson using an Elegant Task.

### **3.1 The 2009 Primary and Lower Secondary Art Syllabus and its influence on the teaching of Art**

In Singapore, Art is deemed by the Ministry of Education (MOE) as an important subject through which pupils at all educational levels can be equipped with the 21<sup>st</sup> century competencies and be holistically prepared for successful adult life. This is seen in the recent move by the Ministry of Education (MOE) to strengthen aesthetic education (MOE, 2010). Its revised 2009 Primary and Lower Secondary Art Syllabuses recommended that the primary schools’ planning of their Art Instructional Programme should be guided by six principles, namely, “learner-centred”, “process-oriented”, “contextualized”, “interactive”, “initiative-related”

and “fun” to fulfill seven objectives, amongst which are: (1) “create artworks to share their ideas, thoughts and feelings”, (2) “cultivate a spirit of innovation and experimentation” and (3) “develop sensory awareness and imagination” (MOE, 2008, p. 3 & 7). The implementation of the guiding principles for planning the Instructional Programme and the objectives spelt out in the revised 2009 Primary and Lower Secondary Art Syllabus was concretised in 2010 when MOE moved to strengthen Art education.

The learning outcomes for the Primary One and Two pupils are spelt out in the 2009 Art syllabus as follows:

1. Identify simple visual qualities in what they see around them
2. Be curious about what they see
3. Share their imagination, thoughts and feelings through art making
4. Wide use of art materials and medium
5. Enjoy looking at and creating art
6. Talk about what they see and experience (MOE, 2008, p. 5)

These learning outcomes, which are derived from the objectives and the framework of “Seeing”, “Expressing” and “Appreciating” in the Art Syllabus, will allow the students to “observe their environment, generate ideas, create artworks, discuss about art and value the role of art in society” (MOE, 2008). In short, Art education in Singapore aims to enable every student to be visually literate and to appreciate art.

### **3.2 Elegant task, its characteristics and its effect**

Teaching for creative development necessitates designing lessons that allow learners to perceive, select, and explore, through their own lenses, all the possible visual solutions to the problem (Kay, 1998). In short, teaching of Art needs to be pupil-centric and process-driven so as to develop the creativity and imagination of learners. For this study, I had adopted the Elegant Task approach for my art lessons. The concept of Elegant Task originated from Sandra Kay (1998) who defined it as an open-ended problem which will elicit ‘creative thoughts’ and ‘elegant’ or ‘aesthetically meaningful’ solutions from pupils. According to Kay, an elegant task is one that is worth solving, is studio-based and contains forced choices and constraints, and the level of the elegant task, which ranged from ‘beginner’ to ‘independent’ is determined by the degree the choices and constraints co-vary (Sukaimi, 2013).

Therefore, in setting elegant tasks, the Art teacher should select problems that are relevant to the experiences of the pupils for them to be able to relate

to and to find them worth solving. The elegant problem should also be sufficiently flexible for all educational levels and all categories of pupils to adapt it for their own use (flexibility), will allow many possible, creative and original solutions as it is open-ended (fluency), and should also be studio based (Kay, 1998, p. 281).

It is envisaged that setting such elegant problems will empower the pupils to make choices and meaningful decisions in the ideation and art-making process, will enhance their technical and intellectual growth, and encourage them to discover and explore the attributes and characteristics of the materials in greater depth, thereby leading to other extraordinary forms of the craft (elaboration) (Sukaimi, 2013, p. 10). An elegant problem will improve the pupils’ engagement in the task as it will evoke reflection, decision-making and meaning-making which are processes for deriving original and creative solutions (originality). Pupils will intuitively feel a sense of ownership and pride when the art-making experience is meaningful and satisfying (Sukaimi, 2013, p. 9). According to Sukaimi (2013), by designing tasks that invite flexibility, fluency, elaboration and originality of responses, the teacher is engaging his/her pupils in the creative thought process.

The way the teacher shapes an elegant task can affect what and how her pupils learn. Kay (1998, p. 331) says, “Visual problems that are challenging and can be solved successfully by diverse learners have more than one answer. This takes practice on the part of a teacher and a willingness to establish criteria and parameters that allow for individualism. Designing elegant problems takes thoughtful practice.”

Thus, Elegant Task approach is chosen for my research study as it best fits the 2009 Art Syllabus set by MOE. During the study, pupils were given opportunities to identify visual qualities they see around them during the Tuning-in Activity, arouse their curiosity through guiding questions during the exploration and the discovery stages, and express their inner thoughts, feelings and imagination through different medium during the art-making process.

### **3.3 Different types of learning dimensions in learners and their stages of artistic development**

According to Kay (1998), “Elegant Tasks” is grounded in theories which are consistent with other theoretical works. Amongst these are the different types of learning dimensions which affect the pupils’ learning of Art. The learning dimensions are categorised as affective, social and cognitive and are elaborated below.

The affective dimension of learning is described in Csikszentmihalyi’s “flow construct” motivational

theory in which he suggests that learning will be intrinsically motivating when a problem is pitched at an appropriate level of difficulty for the pupil (Csikszentmihalyi, 1990). That is, the task set by the Art teacher must be within the pupils’ current ability level to handle for it to be appealing to them. If it is beyond or below their ability, then they will experience anxiety or boredom accordingly when handling the task. Learning will occur when the pupils find the task assigned by the Art teacher intrinsically motivating and can handle it (Kay, 1998).

The social dimensions of learning are grounded in Vygotsky’s theory of intellectual development. Vygotsky (1978) believed that “cognitive development originated from social interaction” before knowledge is internalised and the “capability to learn under a teacher’s guidance varies tremendously in children with equal levels of mental development”. Vygotsky terms this “area of fluctuation” in developmental level as the “zone of proximal development (ZPD)” and views “good learning” as “that which is in advance of development”. ZPD is the “distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (Vygotsky, 1978). Based on this theory, art tasks must be pitched at a higher level than the pupils’ current level of problem-solving skill (Kay, 1998).

The cognitive dimensions of learning are premised on the differences in cognitive development among individuals in artistic problem-solving. Arnheim (1974) suggests that the imagination necessary to engage in artistic problem solving requires abstract thought” (as cited in Kay, 1998, pg.264). Kay (1998) therefore advocated that Art teachers need to first understand the cognitive processes associated with thinking in art if they are to systematically develop abstract thought in their pupils. According to her, pupils respond to an assignment or problem differently. They used problem-solving strategies which required thinking when handling the assignment or problem. Their choice of problem-solving strategies is influenced by their prior experience and whether the assignment/problem is close- or open-ended in nature (Kay, 1998). That is, the level of the students’ expertise in the subject matter affects their perception and interpretations of the assignment/problem and influences the approach they used to perform the assignment or to solve the problem. The higher the level of expertise, the more advanced is the product of their work (Kay, 1998).

On the other hand, understanding the stages of artistic development in children can also aid the Art

teacher to plan and execute lessons effectively. Lowenfeld (1947) argues that there are six defined stages of artistic development in children and that these stages can be witnessed in their artworks. The six stages are: Scribble Stage (1-3 years old), Preschematic Stage (3-4 years old), Schematic Stage (5-6 years old), Dawning Realism Stage (7-9 years old), Pseudo-Naturalistic Stage (10-13 years old), and lastly Decision Stage (13-16 years old). As my Primary One pupils are between the ages of six to seven, majority of them are progressing from the Schematic Stage to the Dawning Realism Stage as observed in their artworks. Thus, during the study, the four Elegant task unit topics were designed to pitch at the Dawning Realism Stage whereby pupils were required to use more complex schema when conceptualising and creating their artworks.

Hence, in order to design meaningful assignments/problems for optimal engagement and learning in pupils, the Art teacher needs to know the different types of learning dimensions in learners and the stage of artistic development the pupils are at so as to set the tasks to be done in Art accordingly. By paying attention to the affective and social dimensions of learning, the Art teacher could empower the pupils to take ownership of their learning while being cognizant of the cognitive dimensions of learning which “can enhance the learning of a novice or assist the non-artist’s appreciation of the complexity of thought in producing ideas in art” (Kay, 1998, pg.266).

In summary, I have summarised the above literature review of different types of learning dimensions in learners as follows:

- Point a: Task must be within the pupil’s ability
- Point b: Opportunity for independent problem solving
- Point c: Collaboration with more capable peers
- Point d: Choice of problem-solving strategy

#### **4 ACTION RESEARCH CYCLE THREE: MY INTERVENTION IN CLASS**

The study commenced in May 2013 and ended in September 2013. However, the research project spanned a total of 10 months from conception to completion of the written research report.

##### **4.1 Selection of participants**

The sample for this research study comprised a class of thirty Primary One pupils, who were seven year-old from a typical public primary school. This class was a multi-ethnic class with mixed-ability and mixed-gender. Table 1 below shows the distribution of pupils by ethnicity, academic grouping and gender. There were thirteen girls and seventeen boys,

of whom eight were high-progress pupils, fourteen middle-progress and eight low progress pupils.

Primary 1 pupils were selected for this research study as they were fresh from Kindergarten and had not gone through any formal Primary School Art Education yet. There were no previous primary school Art experiences to influence their views.

## 4.2 Elegant Task Lessons

Four Unit topics totalling eleven Elegant Task lessons were carried out with the pupils who participated in this study. These Unit topics were (a) Colour Theory, (b) Drawing from Observation, (c) Fold and Dye and (d) Printmaking. Refer to Appendices A to D for the detailed lesson plans. I have used the Colour Theory lesson plan (Appendix A) as an example on how I have linked the Literature Review to my lesson plan by incorporating the Points (a, b, c and d) as highlighted in this AR Cycle 2. In addition, I have also added three new points here as my own initiative to value-add and to enhance my pupils' engagement in the art lessons. The three new points are:

Point f: Group discussion

Point g: Class presentation

Pupils' safety is very important during Art lessons. I always make sure that my pupils are not allowed to handle sharp objects that would compromise their safety. Teacher's supervision is necessary when pupils are exploring art medium and materials. Group discussions are also added into each unit topic as pupils could also learn from their peers when they talked among themselves in their own language. To conclude each unit topic, I have added in the class presentation segment to create opportunity for pupils to share and talk about their feelings, experiences, thoughts and ideas before, during and after the art-making process.

The eleven Elegant Task lessons were conducted between May 2013 and September 2013. The pupils had their conventional (teacher-centred) Art lessons from January 2013 to April 2013 before the commencement of this research study.

**Table 1.** Distribution of Students by Ethnicity, Academic Grouping and Gender.

Ethnicity	Students' academic grouping						Total
	High progress		Middle progress		Low progress		
	Male	Female	Male	Female	Male	Female	
Chinese	2	6	7	2	2	2	21
Indian	0	0	1	0	2	0	3
Malay	0	0	0	2	2	0	4
Others	0	0	1	1	0	0	2
<b>Total</b>	<b>2</b>	<b>6</b>	<b>9</b>	<b>5</b>	<b>6</b>	<b>2</b>	<b>30</b>

**Table 2.** Descriptions of the Four Elegant Task Art Lessons.

Unit Topic	Number of lessons	What the Teacher Did	What the Pupils Learnt	Elegant Task for Art-Making
Colour Theory	2 lessons spread over two weeks	Being a repeat lesson, the teacher used the time to teach the pupils what elegant task is and how to solve problems	Pupils learnt about primary and secondary colours and discovered for themselves which 2 primary colours mixed together to produce a secondary colour <i>(Point a, b, f and g)</i>	Mothers' Day is coming! You want to design a very special Mothers' Day card for your mother. Draw a portrait of your mother on the card and outline it with black permanent marker. Cover the whole card with yellow, red and blue coloured tissue paper. Use only water and brush to paste the tissue paper on the card. Give the completed card to your mother to surprise her on Mothers' Day.

Drawing from Observation	3 lessons spread over three weeks	The teacher showed pupils some unique houses found around the world and discussed about the structures, functionality and aesthetic values of the houses. The teacher also asked pupils to think what a house meant to them.	Pupils learnt about sketching building blocks from observation. They discovered that in order to make their sketches more realistic, they had to include the side view as well. <i>(Point a, b, c, d, f and g)</i>	You have a piece of land. You want to design and build a house for you and your family to live happily in. Create your house using six building blocks and sketch it onto the sketch book using pencil. Colour it with coloured pencils. Consider each family member's likes and dislikes and build a house to surprise them.
Fold and Dye	3 lessons spread over three weeks	The teacher taught the fold and dye technique in Lesson 1 followed by self-discovery and exploration time for the pupils.	Pupils learnt the technique of folding and dyeing paper. They discovered that when they opened their folded paper, repeated patterns were created. Thus, this led them to discover that different kinds of folding would produce different kinds of repeated patterns. <i>(Point a, b, c, d, f and g)</i>	Your school has bought plastic covers for all pupils to protect their desks. Your Principal wants all the pupils to decorate their desks beautifully. You are given a piece of white rice paper to decorate your desk. Using the fold & dye method, fold your rice paper no more than 6 times and dye it with batik dyes to achieve your desired repeated patterns. Decorate your table proudly with your new rice paper once you have finished.
Printmaking	3 lessons spread over three weeks	In lesson 1, the teacher taught the pupils the printmaking technique followed by self-discovery and exploration time for the pupils.	Pupils learnt the printmaking technique. They discovered that if they cut the fruits or vegetables from another angle, they would end up getting a unique shape when printed. They also discovered that materials have textures and the rougher it is, the better the print will turn out. <i>(Point a, b, c, d, e, f and g)</i>	You have spent almost a year now in Ngee Ann Primary School since you left kindergarten. Imagine that next year, you will buddy a new batch of Primary 1 pupils! What would you say to your new buddy about the best moment/event you had in Ngee Ann Primary School since January this year? Capture this memorable moment/event using the Printmaking technique. Ink your object with water-proof paint using a brush and print it by hand-pressure. You may also use other objects found around you. Be creative and have fun!

#### 4.2.1 Unit Topic 1

Colour Theory, the data collected from the two lessons were not used for this study as the pupils studied this topic twice, once via the conventional way and the second time using the Elegant Task way. However, the latter lessons served as a time for training and hand-holding the pupils to learn Art via Elegant Task. Two lessons were used to introduce pupils to Elegant Tasks.

#### 4.2.2 Unit Topic 2

Drawing from Observation, the pupils did different art activities. In Lesson 1, they shared what a house meant to them personally, discussed about some unique houses found around the world, played with the building blocks and attempted to build their

dream house for the first time. In Lesson 2, they confirmed their designs after several attempts and sketched these in their respective sketch books. In Lesson 3, they coloured their sketches and presented their designs to their group members. Finally, a few pupils were selected by the teacher to present their dream houses to the whole class.

#### 4.2.3 Unit Topic 3

Fold and Dye, the art-making activities progressed from simple to complex tasks. During the first lesson, the teacher introduced the Fold and Dye technique. After that, each pupil was given five small pieces of rice paper to explore the technique. They then pasted their completed work in their sketchbook as part of their learning process before sharing their best piece of artwork with their group members in the next



lesson. In Lesson 3, the pupils did fold and dye on a desk-size piece of rice paper. By this lesson, each pupil would have decided on how they wanted to fold their paper. When all the students had completed their artwork, they stood in a big circle to appreciate each other’s handiwork. A few students who had not presented before were chosen to present their artwork to the whole class.

#### 4.2.4 Unit Topic 4

Printmaking, three lessons were conducted. In Lesson 1, after the teacher had taught the printmaking technique, each group chose one fruit or vegetable to explore four different ways of cutting and printing it. The pupils in each group discussed which way they wanted to cut the fruit or vegetable. After they had discussed and decided, I would then cut the fruit or vegetable for them as pupils at this age are not allowed to handle a knife. After each cut, pupils printed the fruit or vegetable on their individual worksheet. At the end of Lesson 1, the pupils pasted their prints in their sketchbook. They presented their group findings to the whole class during Lesson 2. They taught their classmates how to cut the fruit or vegetable to achieve certain unique shape when printed. There was interaction between the group doing the presentation and their classmates seated on the floor. Some pupils even suggested other ways of cutting the fruit or vegetable after the group had presented. In Lesson 3, guided by the Elegant Task, the pupils used the given fruit, vegetables and other textured materials to create their individual print. A few pupils were then selected to present their prints to the whole class near the end of the lesson.

### 5 ACTION RESEARCH CYCLE FOUR: DATA ANALYSIS

#### 5.1 Data collection and instrumentation

As this research was a qualitative study, data were collected via focus group discussions. Refer to Appendix E for the list of focus group discussion questions. Five focus group discussions of six pupils per group were conducted to gather data on their perception of using Elegant Tasks to learn Art and doing artworks. The questions for the focus group discussions were patterned after the six specific questions. They covered the three themes of pupils’ reactions to the use of Elegant Tasks to learn Art, what they had learnt in the Elegant Task Art lessons and how the use of the Elegant Task approach helped them to improve their artworks.

As the Primary One pupils were still very young, being only six to seven years of age, the size of each focus group discussion was kept small to avoid their being easily swayed by the views of their classmates.

Also to help them to overcome inhibitions during the discussions, the pupils answered an open-ended questionnaire patterned after the six specific questions prior to the focus group discussions so that they could speak up at the discussion sessions. I was the facilitator for all the focus group discussions and another teacher assisted in note-taking. The focus group discussion sessions were also video recorded.

#### 5.2 Data analysis

The qualitative data from the focus group discussions were then compiled based on the three themes identified. The three themes were: the pupils’ reactions to the use of Elegant Tasks in art lessons, what the pupils learnt through the Elegant Task Art lessons and ways the Elegant Task Art lessons enabled the pupils to produce quality artwork. The three themes were used to narrate the data on the pupils’ perceptions on the use of Elegant Task to learn Art.

##### 5.2.1 Question 1 and 2: Pupils’ reactions to the use of Elegant Tasks in Art lessons

The pupils’ reactions to the use of Elegant Tasks in Art lessons were very positive, favourable and encouraging. To the pupils, the Elegant Task lessons were “exciting”, “fun” with “a lot of interesting activities to do”, and “cool and amazing”. They not only “got to play with their friends when doing art” but they also learnt “new things”, “a lot of new techniques” and “new skills”. They found learning meaningful because they understood the reasons for doing their artworks, and they could do them “creatively” as exemplified by this remark, “No right answers. We can do our own art creatively”. Besides providing opportunities for them to play and learn, the use of Elegant Tasks also helped them to improve their art as they could draw and paint better compared to the artworks done before the research study. The pupils were highly motivated by the use of Elegant Tasks to learn Art as seen from these responses of the students: “I can’t wait for Thursdays to have art lesson. I am happy when it is Thursday”; “It is better than normal art lesson”; “The lessons are great and I love them all” and “It is exciting, interesting and fun. I look forward to [the] art lesson. Although it is at the last 2 periods but I am not tired at all. I’m excited when [the Art teacher] comes in”.

In terms of the four Unit lessons, the most popular lesson with the pupils was Fold and Dye. In their words, it was “fun”, “exciting” and “interesting”. The pupils liked different parts of the Fold and Dye lessons. Some liked the painting part, some like the dyeing part and others like the folding and opening of the rice paper. The painting and

dyeing appealed to the pupils because they liked to paint and create different designs and patterns. The opening of the rice paper was thrilling for the pupils as they excitedly anticipated seeing the patterns they had created. These feelings are summarised by a pupil when he said: “I like the Fold & Dye because it is interesting. I like the opening part because it is exciting to see what the final artwork look like. When I’m painting the patterns, I don’t know how it will look like until I open it.”

The least popular topic was Drawing from Observation. Only two pupils voted for this topic. One of them liked to draw the blocks while the other one liked to colour the blocks using different tones to make them looked three dimensional. Most pupils mentioned that the sketching part was the toughest as this could be that they have not grasped the concept and skill of three dimensional drawing.

The pupils also strongly approved the use of Elegant Tasks to teach Art. Personally, they wanted more lessons using elegant tasks. In the words of one pupil which was echoed by many of his/her classmates, “I want every art lesson to be Elegant Task. It is so fun”. Eleven Art lessons using Elegant Tasks were not sufficient for them. They wanted more of such lessons. Besides thinking of themselves, they also wanted all the Primary One classes to have the opportunity to learn Art using Elegant Tasks. As several pupils recommended: “Every P1 class should have Elegant Task. It is very good”; “All P1 classes should use Elegant Task because it is fun” and “All classes should have Elegant Task. It is very good”. Their reactions to the Elegant Task Art lessons were positive and they had nothing to suggest for improving the lessons.

### 5.2.2 Question 3 and 4: What the pupils learnt through the Elegant Task Art lessons

Through the Elegant Task Art lessons, the pupils acquired artistic and technical skills. They learnt to mix primary colours to get secondary colours, draw the side views of the building blocks to make their house look more three dimensional, create their own repeated patterns and paint them on the rice paper and print the same fruit or vegetables in many different ways after exploring and experimenting with their group members. In the course of art making, some of them also made other discoveries to their delight and amazement. They explored and discovered for themselves how to paint repeated objects instead of just creating patterns and that everyday objects found around them could also be used for printing and making beautiful artworks. For example, one of the pupils painted a quarter of a butterfly and when she opened the rice paper, to everyone’s pleasant surprise, there was a complete

butterfly on the paper. They also learnt how to draw a portrait and make a card (eg., “I learnt to make a Mothers’ Day card for my mother. I feel proud.”), to fold papers creatively, to dye and wait until the rice papers were dry before opening them (so that they would not be torn), to stack up six blocks to make a dream house and “to look at things carefully before drawing”.

In addition to mastering the art-making techniques during the Elegant Task Art lessons, the pupils also acquired soft skills including teamwork, interpersonal, and presentation skills. For teamwork they had learnt, they shared:

- “I learnt to cooperate with my friends during group work. We helped each other and cleaned up together.”
- “I learnt to share things with my group members. We must take turn to use the brushes.”
- “I learnt to wait for my turn patiently.”
- “I learnt to do my part during group work. For example, I laid out the newspapers on the tables. I put the art materials in the middle to share with my friends.”
- “I learnt how to work with my friends. I share materials with them and also help them when they are in trouble.”

Examples of interpersonal skills which the pupils said that they had learnt included “be nice to my friends”, “help them when they need help” or “are in trouble”, “listen when others are talking”, “help each other and cleaned up together” and took responsibility for mistakes made, for example, “I accidentally dropped a drop of paint onto my friend’s pencil case. I quickly took out my handkerchief and wiped the paint off. Luckily, my friend was not angry with me.” and “I accidentally topple a container of batik dye. I ... clean the tables and mop the floor myself”.

In terms of presentation skills, one pupil said: “I can stand in front of my class and talk about my artwork. I know what to say and I say it loudly. Last time, I’m very scared and very shy. After doing in my group a few times, I can now talk in front of my class”.

The pupils also developed characteristics that were related to the 21<sup>st</sup> century competencies (such as Critical and Inventive Thinking, and Communication, Collaboration and Information Skills) and student outcomes (such as being a confident person, self-directed learner and active contributor) (taken from website: <http://www.moe.gov.sg/education/21cc/>). The pupils learnt to persevere, to problem-solve “creatively”, “to face fear”, to be “more willing to try new things during art lessons”, to focus when doing art and not to be distracted easily and to concentrate

when doing art instead of talking to friends. One pupil said, “I learnt how to solve problems myself. For example, when dyeing the rice paper, I cannot get the right colour I want, so I keep trying by mixing two colours until I get it”. Another pupil added, “I learnt to face my fear. When I have fear of doing things, I tell myself to be brave and try it. Now, I’m more willing to try new things during lessons”. They took ownership of their learning.

### 5.2.3 Question 5 and 6: Ways the Elegant Task lessons enabled pupils to produce better artwork

According to the pupils, their artwork had improved compared to the beginning of the year. One area which they indicated that had improved was drawing. From their perspective, their drawing now had “improved a lot”, was “nicer”, “more interesting” and “better”, and “look more real”. Not only were they able to produce quality artwork, they also picked up skills and developed better habits and quality. They could “draw more shapes” and “hold the pencil properly”. They also practised “drawing more often at home” and during “free time” and had more patience now when drawing, thus showing their ability to self-direct their own learning.

Besides drawing, they improved their painting and colouring as well. Their painting was “nicer” because they could “control the brush well”, “paint within the line”, paint and colour “without white spaces”, and “paint in one direction”.

## 6 ACTION RESEARCH CYCLE FIVE: MY REFLECTION AND PERSONAL LEARNING

The results of this study showed that the Elegant Task Art lessons were well-received by this group of Primary One pupils. They enjoyed the Art lessons because they were more meaningful, interesting, fun and exciting than past Art lessons (from January to April). They also benefited from the exposure to Elegant Tasks both in terms of artistic skills and personal development. They viewed their artworks with pride. They were so motivated and inspired by the Elegant Task approach to learning Art that they did extra practice of artwork at home and during free time and they wanted more of such lessons not only for themselves but also for other Primary One pupils. These findings supported Sukaimi’s (2013) point that “when the art-making experience is meaningful and satisfying, students will intuitively feel a sense of ownership and pride”. The use of Elegant Tasks to teach Art seemed to have fulfilled the principles of “learner-centered”, “process-oriented”,

“contextualised”, “interactive”, “initiative-related” and “fun” as articulated in the 2009 Art Syllabus (MOE, 2008).

I had also observed some positive behaviour that the pupils exhibited while learning Art using Elegant Tasks. Firstly, I noticed that most of the pupils were able to think independently and critically to explore and generate new ideas during the group discussion and collaboration stages. When guided by me, they were able to expand and develop their ideas further (ZPD as mentioned in this research cycle 2), and completed their final artwork independently and confidently. Secondly, the pupils were also able to communicate effectively with me and their peers during the group presentation and class presentation. Thirdly, they were more outspoken and asked questions and sought clarification when they were in doubt and following clarification, they would reflect on their own actions during the art-making process and persevere till they completed the tasks. Fourthly, the pupils were able to work effectively in groups. Good teamwork not only promoted a deeper level of learning among the peers but also, learning to talk with and to listen to one another were important communication skills that pupils had acquired along the way. Lastly, they took responsibility for their own learning as all of them had completed and handed in their final individual artwork for all the art lessons. These observations made (triangulated) support the perceptions of the pupils that they had grown cognitively, affectively and socially through the Elegant Tasks Art lessons.

The notion of Elegant Task could only provide a framework or a structure for me to work on. Ultimately, I had to decide what could work or not in my class by knowing my pupils well when planning the lessons. Therefore, my selection of topic and the design of the lesson plans in this research study were not a do-this-and-do-that lesson. They were based on three considerations: simplicity, involvement, and achievement. They were intended to amuse the pupils into developing an awareness of his or her own-style of thinking, its strong points and its weaknesses. One pupil might get blocked at a certain point. Another pupil may never make use of certain strategies. Awareness is the first step to correction and improvement in any skill – this is the essence of my lesson plans. In fact, the only effort required from a pupil is that he or she should ask himself or herself the question: “Why am I having difficulty over this?” during the art lessons.

I observed some limitations during this research study. This study was carried out over one term, from July to September. A few lessons were disrupted due to public holidays and closure of school due to National Examination. Thus, I could not carry out the full lesson in each unit as planned. I had to borrow periods from other subject teachers to make up for

the lost time. As the period for implementing the Elegant Task Art lessons was short, with only four Unit Lessons, it was not possible to see its full impact.

In addition, this research project is a very small scale study. The data collected and analysis could not be generalised due to the small sample size. Time did not permit the use of other methods of data collection so that the additional data source(s) could be used for triangulation. Furthermore, no similar previous research studies were done in this area. Consequently it was also not possible to validate the findings of this study with the findings of other similar research.

Hence, it is recommended that this study be replicated in future with modifications to the design to avoid the pitfalls/gaps of this study. The sample size should be increased and the duration of the study lengthened to better determine the effect of the Elegant Task approach. It is also recommended that the timing of the project be changed to the beginning of the year so that there would be sufficient time to implement the Elegant Task Art lessons to assess their impact.

## 7 CONCLUSIONS

In conclusion, the pupils’ perceptions on the use of Elegant Tasks in Art were favourable and promising. The eleven Elegant Task lessons benefited this group of pupils by developing them artistically, socially and affectively.

In fact, Hase and Kenyon (2007), Hase and Tay (2004), and Tay and Hase (2004, 2010) make a distinction between knowledge and skill acquisition and that of learning. Knowledge and skills or competencies can be acquired and even reproduced. But, this is not learning at a deeper cognitive level. Learning is an integrative experience where a change in behaviour, knowledge, or understanding is incorporated into a pupil’s existing repertoire of behaviour and schema (values, attitudes and beliefs). For example, let’s recall a pupil’s comment from “Question 3 and 4” in the “Data Analysis” section. That particular pupil learnt that a third colour could be formed by mixing two different colours in class. However, to get the intended colour for dyeing the rice paper, that pupil had to go beyond just merely mixing of two colours. Firstly, that pupil had to identify the valid category of colour by selecting a pair of different colours. Secondly, that pupil had to work out the required proportions of each colour from the chosen pair of colours from step 1 in order to obtain the intended colour tone. The two steps mentioned were not taught to that pupil. That pupil had to keep trying in unanticipated situation by mixing the two colours until the intended colour was obtained. In other words, it is possible to acquire a

set of competencies that one can repeat in familiar or known circumstances. However, if learning has taken place, competencies can also be repeated and even adapted in unfamiliar, unanticipated situations.

After using this pupil-centred approach in my study, I realised that the benefits outweighed those from the traditional teacher-centred approach to teach Art. Looking forward, I will be switching to this new approach to teach art without hesitation. I strongly believe that for now this is a positive way forward in teaching Art and would strongly recommend it to all Art teachers.

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## Empowering Students' Autonomy In Learning Tefl Subject Through Lesson Study

*A study conducted to 6th semester students of English Education study program of FKIP Unpak*

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**Abstract:** This study is meant to improve students' autonomy in learning TEFL subject through Cooperative Learning and lesson study. The study is conducted in English Education Study Program, and the participants are the students of semester VI A and B. This study involves a team of TEFL lecturers who collaborate with more than five observers. The data of this study are gained from observation, documentation, questionnaire, and interview. The method used in this study is Classroom Action Research by implementing Lesson Study design. The teaching strategy used in this study is the modification of Cooperative Learning method. The data show that there is an improvement of students' autonomy in learning TEFL. Besides, they enjoy learning because through lesson study along with the application of cooperative learning method the classroom atmosphere is more conducive. Their involvement and participation in learning is also improved. The lecturers who facilitate the subject also improve their teaching strategy in order that the students achieve the goal of learning. Thus, it can be concluded that the application of Lesson Study design along with Cooperative Learning method can improve students' autonomy in learning TEFL subject as well as lecturer's strategy in facilitating the students to reach the goal of learning.

**Keywords:** Learning autonomy, TEFL subject, lesson study

### 1 INTRODUCTION

#### 1.1 Background of the Study

Learning system in higher education demands the students to become autonomous learners who can initiate their own learning, monitor their own learning progress and evaluate their own learning achievement (Schunk, 2005). Learning autonomy is supposed to start since the first year of their study so that after several semesters of their study, the students get used to be autonomous learners. However, based on the writer's observation the students who were studying in semester 6 in English Education Study Program did not show that they were autonomous learners. Some indicators that show the phenomenon are: (1) during the learning process the students tend to depend merely on the explanation given by the lecturer; they did not search or explore the knowledge by themselves, (2) the students did not have textbooks or any other sources as the references for their study, (3) even though they did not understand the lesson, the students tend to study individually rather than studying cooperatively with their friends.

By looking at those indicators, the writer tried to identify the factors that make them happen. Some of the factors are: (1) the lecturer did not facilitate

interaction among the students, (2) the lecturer did not

facilitate the students to do self assessment and peer assessment, (3) there is no collaboration among lecturers to do team teaching and open lesson.

Seeing the problem and its causes the writer conducted a study to develop learning autonomy in Teaching English as a Foreign Language (TEFL) subject through lesson study. This study was conducted to the 6th semester students of English Education Study Program, Faculty of Teacher Training and Educational Science, Pakuan University.

#### 1.2 Limitation of the Problem

This study is limited only on learning autonomy in Teaching English as a Foreign Language (TEFL) subject through lesson study in which modified cooperative learning structure is also implemented.

#### 1.3 Aim of the Study

This study is aimed at empowering the 6th semester students' learning autonomy in learning TEFL subject through lesson study.

#### 1.4 Research Question

Based on the aim of the study, the research question for this study is “How can lesson study empower the 6th semester students’ learning autonomy in learning TEFL subject?”

### 1.5 Theoretical Foundation

TEFL is one of important subjects for the students of English Education Study Program. TEFL become one of the required subjects for Practice Teaching Program in which the students practice their teaching skill in the real situation (the school). In TEFL subject the students learn about the principles of teaching English as a Foreign Language, classroom management, lesson planning, media development, teachers’ roles and other things related to pedagogy of English teaching. To understand more about this subject the students should read many references, discuss both with their classmates and the lecturer, observe the real teaching in real situation and do some teaching practices in the classroom. Thus, to understand this subject better the students should be able to understand the theory and do the theory into practice. To achieve the goal of learning, it is important that the students become autonomous learners.

Autonomous learners are those who are able to state their learning target, assess their own achievement, as well as question and cooperate with other people to solve problems. Brandes and Ginis called autonomous learning as Student-centered Learning which has the following principles:

- The learner has full responsibility for her/his learning
- Involvement and participation are necessary for learning
- The relationship between learners is more equal, promoting growth, development
- The teacher becomes a facilitator and resource person
- The learner experiences confluence in his education (affective and cognitive domains flow together)

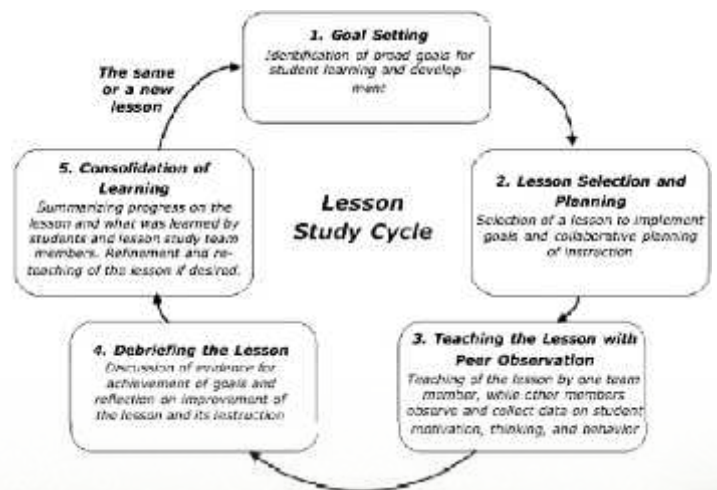
It shows that in autonomous learning the students are responsible toward his/her own learning. It also involves other people in the learning process, while the lecturer only plays a role as a facilitator of the learning process and one of the resources.

The principles of autonomous learning (Lacey) should be in line with its learning principles as follows:

- Autonomy means moving the focus from teaching to learning.
- Autonomy affords maximum possible influence to the learners.
- Autonomy encourages and needs peer support and cooperation.
- Autonomy means making use of self/peer assessment.
- Autonomy requires and ensures 100% differentiation.
- Autonomy can only be practised with student logbooks which are a documentation of learning and a tool of reflection.
- The role of the teacher as supporting scaffolding and creating room for the development of autonomy is very demanding and very important.
- Autonomy means empowering students, yet the classroom can be restrictive, so are the rules of chess or tennis, but the use of technology can take students outside of the structures of the classroom, and the students can take the outside world into the classroom.

The principles indicate that autonomous learning does not only involve the students themselves but also involving support from other people such as classmates, the lecturer who teaches the subject and also other collaborated lecturers. The involvement of other people in learning can be done through lesson study.

Lesson study emphasizes on learning reflection which aims at enhancing the next learning process. There are three steps done in lesson study: plan, do



and see. The following is the steps in lesson study:

Figure 1 Lesson Study Steges

Lesson study emphasizes on students learning, not teacher teaching. It means that the focus of lesson study is identifying how the students learn in the

classroom, what problems they have, and any other things about learning as stated by Lewis dan Hurd (2011), “Lesson study focuses on student learning and development. It provides a rare and valuable chance for teachers to be in a classroom solely to investigate student learning, unencumbered by the need to manage students or provide instruction.”

	Obs#2: A student did not pay attention Obs#3: - Obs#4: A few students did not pay attention on another group presentation
Learning materials	Obs#1: - Obs#2: Different tasks made the students have different understanding Obs#3: - Obs#4: -
Classroom activities	Obs#1: - Obs#2: Pre-activity did not engage the students' attention on the lesson Obs#3: - Obs#4: -
Classroom equipment	Obs#1: The technical error disturbed the students' concentration Obs#2: - Obs#3: The name tag was too small Obs#4: -

## 2 RESEARCH METHOD

This study applies descriptive method which uses observation, questionnaire and interview as the instruments to collect the data. Observation is done in four times open lessons. In each of the open lesson either the number or the name of the observers are not the same. The questionnaires are distributed to the students directly after the class. This study involves the students from semester 6, two teacher model and some lecturers of English Education Study Program.

## 3 DATA DESCRIPTION AND ANALYSIS

The overall of the study shows that lesson study can empower students' learning autonomy. The following is the description.

### 3.1 Data from observation

There are two materials that the students learned during the study: lesson planning and classroom anticipation. The observation cover five things: group work, monitoring activities, learning materials, classroom activities, and classroom equipment.

Table 1 First meeting bservation result

Classroom management	Observation notes
Group work	Obs#1: There was unbalanced grouping Obs#2: Some students dominate the talk Obs#3: Some students dominate the talk Obs#4: There were skillful and unskillful group work
Monitoring activities	Obs#1: A few students did not pay attention on another group presentation

From the observers' observation, it can be concluded that:

- In doing group discussion there is a group which has not understood how to work efficiently, especially when they should fill in the worksheet. Instead of discussing the answer together with their team mates, they write the answer directly on their own book then they discuss the answer with their team mates.
- Some shy and passive students have not engaged with their team mates during the learning activities.
- There are some groups that are still discussing when another group is presenting their discussion result.
- When one group is presenting the other groups are evaluating and comparing their work with other groups.
- There is a group that cannot discuss effectively because there is no clear job description among the group members so that some students are dominant.
- There is a group whose the members are still confused of what to do and they should rewrite the discussion result when the time for writing ends.

However, it was also found that:

- Discussion activities make the students discuss actively and effectively with their team mates.
- More students can answer the questions given by the lecturer more comprehensively.
- More students are motivated to respond the lecturer's questions.
- More students are ethusiastic to know their achievement.

From the findings the writer and her team replan the lesson to fix the problem. In the new lesson plan, the writer manage central group discussion activity and presentation activity. It is



done to minimize group discussion while another group is presenting. Besides, the students are asked to bring textbooks or other sources so that they can get valid reference to answer the questions given by the lecturer or the problems they find during the discussion session.

In the next lesson, the new plan is implemented and many negative findings in the previous lesson decreased significantly. For example, more students bring textbooks and other references into the classroom, and since the grouping places the students with heterogenously, the group discussion worked better; more students were involved in the group discussion activity.

Table 2 Last meeting bservation result

Classroom management	Observation notes
Group work	Obs#1: The students were actively involved in pair work and group work. Obs#2: Group work ran better. Obs#3: Learning activity ran better; no more domination Obs#4: Grouping was more effective.
Monitoring activities	Obs#1: Some students were less responsive. Obs#2: A few group are less active in doing the discussion. Obs#3: Some pair were active, the others were passive. Obs#4: A few students were very active.
Learning materials	Obs#1: A few students made mistakes. Obs#2: Some students could explore more problems. Obs#3: - Obs#4: -
Classroom activities	Obs#1: A few students could not respond the lecturer's question. Obs#2: A few group could give very clear explain. Obs#3: - Obs#4: Different point of discussion made one student confused.
Classroom equipment	Obs#1: - Obs#2: - Obs#3: - Obs#4: -

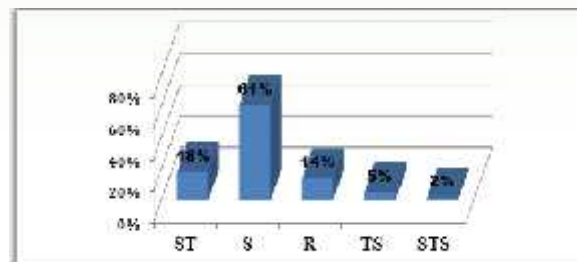
In general, the observers evaluate that the lesson run better and better from one class to another class. The students' responses given in the reflection stage strengthen the observers' findings. The students said that the class which implements open lesson is more dynamic and anthusiastic. Discussion activity in group made them able to give opinion freely without being afraid of making mistakes. Besides, various activities given such as individual work, pair work and group work make the students who are dominant give opportunity to other group member to give opinion, and shy students start to speak and get involved in the discussion activity. Discussing with

pair and with team mates in the group and exploring knowledge by themselves indicate that learning autonomy happens from learning individually, learning with pair, and learning in a group.

### 3.2 Data from Questionnaire

Besides from observation, the data for this study are taken from questionnaire distributed to the students to find out their responses toward the learning process. The data from the questionnaire can be seen in the figure 2.

Figure 2 Students' responses toward the learning process



From the figure it can be seen that 61% students agree if open lesson is done in TEFL class to empower learning autonomy. The rest of them, 18% totally agree, 14% doubtful, 5% disagree, and 2% totally disagree. It means that more than half of the students give positive response toward the implementation of lesson study in TEFL class to empower the learning autonomy.

### 3.3 Data from Interview

To find out the students' response on the implementation of lesson study to empower students' learning autonomy, the writer conducted interview with some students involved in the study. The interview result shows that the students found through open lesson, where many lecturers were observing them learning, the class was more interesting and challenging (S#1). They also said that the learning process was enjoyable (S#3) and the discussion was more focused (S#2) because they were challenged to identify the problems as well as to find the solution through discussion and collaborative work (S#4). In conclusion, lesson study can make the classroom activities run better, because the students work actively and collaboratively with their peer or with their team mates. Figure 2 shows that 77.5% students find that lesson

study could make them be autonomous learners, while 22.75% students said that lesson study could not make them autonomous learners.

Figure 3 Students' Response on the Impact of Lesson Study on Learning Autonomy



#### 4 CONCLUSIONS

From the data analysis taken from observation, questionnaire and interview this study shows that the implementation of lesson study in TEFL subject can empower the 6th semester students' learning autonomy. Even though few students think that lesson study cannot help them become autonomous learners, the writer suggest that lesson study is implemented in the classroom in other subjects. The weaknesses found in this study is not about the lesson study, but it is more about classroom management. The writer then suggest that the future lesson study concentrates on classroom management and involves more observer to find out classroom problems the students face in learning or any other aspects besides learning autonomy.

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## Lesson Study In Teaching Practicum: A Case Study

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**Abstract:** Lesson Study, originated from Japan has provided a potential and innovative approach of teacher professional development. From the year 2011, Lesson Study has been implemented progressively by the Teacher Education Division of the Ministry of Education Malaysia to enhance teachers' teaching aimed to improve students' learning and ultimately, their academic achievement. Despite some challenges to carry out Lesson Study, there were generally positive responses and encouraging outcomes from the participating teachers. They espoused that the concept and notion of Lesson Study ought to be exposed early to trainee teachers in their teacher education programmes. This would then help to promote Lesson Study more broadly at school level. A research study was initiated in one of the 27 teacher education institutes in Malaysia. Lesson Study was introduced to 41 mathematics teacher trainees. Due to logistic matters, they were informed to be self-initiative and carry out Lesson Study on their own accord. The justification was Lesson Study is indeed self-initiative and moreover, it was not a compulsory requirement in their course of study. Overall, it was lukewarm response in their 4-week practicum due to very tight schedules and other tasks assigned to their practicum. Nonetheless, three teacher trainees showed keen interest and implemented Lesson Study in the first practicum. They vowed to continue Lesson Study in their second 8-week practicum in the following semester. It was our interest in this paper to expose and reveal what had transpired between the trainee teachers during their teaching practicum. The findings may provide suggestions for Lesson Study to be incorporated in the teacher education programme.

**Keywords:** Lesson Study, professional development, self-initiative, reflective practice, lesson plan.

### 1 INTRODUCTION

Many countries are dissatisfied in teacher preparation and this has pressured the move towards more school-based experiences (Korthagen & Kessels, 1999). Prospective mathematics teachers continue to show lack of images of “reformed” teaching that engage students to experiment, analyse, conjecture, justify and make connections. Hence, to better prepare the teachers, it seems more relevant to link the pedagogical theories into practices, thus engage the teachers in collaborative tasks, discourses and environments. This will help them more systematically to develop the reformed images of mathematics teaching. In Japan, Lesson Study as a form of professional development practice was credited to enable the Japanese teachers to build an emphasis on problem-solving and “teaching for understanding” in mathematics. It engages teachers in small group to systematically

examine their teaching plans and practices, with the goal of becoming more effective.

### 2 WHAT IS LESSON STUDY?

*Lesson Study* is a form of teacher professional development practised decades ago in Japan. Small groups of teachers (4 or 5 teachers) meet at stipulated time to plan, implement, evaluate, and revise lesson plan collaboratively. According to Shimahara (1998), the main purpose of Lesson Study is to enhance teachers' pedagogical knowledge and skills through peers' review, critique and collaboration among teachers. In the Japanese teaching career, teachers would engage in a relentless and continuous process of improving their teaching by participation in Lesson Study groups (Stigler & Hiebert, 1997; Shimahara, 1998; Lewis & Tsuchida 1998; Stigler & Hiebert, 1999; Yoshida, 1999; Lewis, 2000). Consequently, the Japanese teachers have well adapted Lesson Study as part of

their teaching career and profession. Briefly, a Lesson Study cycle consists of the following 6 steps (Fernandez & Yoshida, 2004, pp. 7-9). All participating teachers are expected to work together to:

*Step 1: Collaboratively planning the lesson plan*

Teachers come together to plan a lesson in collaborative nature. They share their teaching knowledge and ideas of an effective lesson drawing on their past experiences, observations on students' abilities and ideas from resources and textbooks. Ideally, there are at least three discussions. The first discussion is aimed to brainstorm and share teaching ideas and problems; the second one is to draft the sequence of the lesson while the third one is to refine the lesson in terms of coherence and appropriateness for the students. The end product is a lesson plan that describes in details the process of teaching and learning.

*Step 2: Seeing the lesson plan in action*

A teacher from the group will implement the lesson plan to his or her students while other teachers will act as observers during the lesson. Teachers are not encouraged to help the students but instead reflect on the weaknesses of the lesson plan. Occasionally, an expert from an educational institution is invited to observe the lesson.

*Step 3: Discussing the lesson plan*

This step should be carried out immediately after the teaching of the lesson. The teachers come together to reflect on the lesson that has been taught in a real classroom context. The teachers share what they have observed during the lesson, comment on their reflections and provide suggestions. The objective is to identify weaknesses and improve the lesson.

*Step 4: Revising the lesson plan*

Based on the teachers' observations and reflections of the lesson, the teachers would decide collaboratively to revise and update a new version of the lesson plan.

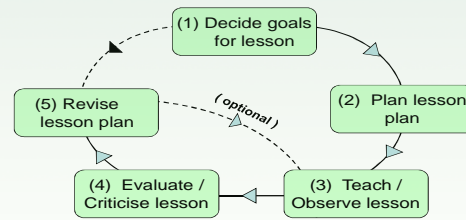
*Step 5: Teaching the new version of the lesson*

Although this step is optional, very often another teacher from the group will teach the revised version of the lesson in another classroom. As in the previous observed lesson, other teachers will again act as observers during the lesson.

*Step 6: Sharing reflections about the new version of the lesson*

The teachers will come together again to discuss and reflect on the revised version of the lesson taught. Again, the teachers share their observations, comments and suggestions. Following this, they collaboratively revise the lesson plan.

In brief, a Lesson Study's cycle consists of the following steps:



Lesson Study's cycle

### 3 PURPOSE OF THE STUDY

The purpose of this study was to examine and evaluate if Lesson Study is viable to be incorporated in the 4-year teacher education programme. Based on our feedbacks, practising teachers have espoused that Lesson Study ought to be introduced and exposed to the trainee teachers in their teacher education programme. This would then help to promote and spread Lesson Study more broadly to the schools later. Lesson Study is relatively new as an approach for teacher professional development, in particular the pre-service teachers in the Malaysian education context. Hence, the researchers hoped to examine the feasibility of Lesson Study to be incorporated in the teaching practicum.

### 4 METHODOLOGY

Prior to the study, the researchers conducted a four-hour Lesson Study workshop to 41 mathematics trainee teachers in one of the teacher education institutes. The workshop was held before their first 4-week practicum in their third year of study. During the workshop, the background, concept and process of Lesson Study were introduced and explained. This included a 20-minute video presentation entitled *Lesson Study: An Introduction*, produced by Global Education Resources of the United States. Subsequently, the benefits of Lesson Study were revealed based on the research studies conducted. In addition, small groups of discussion to plan lesson was also held within their own ability. Due to logistic matters, the trainees were advised and informed to be self-initiative. The justification was Lesson Study is indeed self-initiative and any top-down instructions may put dilemmas and unnecessary worry to the trainees. Nevertheless, they were informed to seek assistance from the

researchers if the need arise. No specific instructions were imposed as voluntarily participation should be adhered in research ethics (Creswell, 2003; Bryman, 2004).

Under such circumstances, it was lukewarm response as only three teachers tried out Lesson Study in one of the schools. This was however within our expectation as the 4-week practicum is indeed very short. Moreover, this was their first time in real teaching and they also had other tasks assigned to them during the practicum. Most trainees ignored it probably because Lesson Study is not any compulsory requirement in their course of study. Our brief interaction with the three trainee teachers after the first practicum encouraged us to seek more information. The trainee teachers expressed positively the outcomes and proposed Lesson Study to be included as part of their teaching practicum. Without hesitation, they vowed and expressed they will continue doing Lesson Study in their next practicum in the following semester. We were very pleased and decided to probe for further details. We then proposed to the three trainees if they could become the participants of our study. We agreed to provide our expertise in Lesson Study and work together with them, and in return they will provide their thoughts, beliefs and perceptions of Lesson Study as data for our study.

The following semester has 8 weeks of teaching practicum. Unfortunately, one of them was assigned to a different school which was rather far from her friends. Hence, she decided to withdraw on her own accord while the other two trainees remain determined and keen to carry out Lesson Study. It is our aim in this paper to reveal and expose what are the pulling factors or attractions of Lesson Study to them during the teaching practicum. This study employed qualitative research methods to examine the perceptions of the participants towards the implementation of Lesson Study. Interpretative research paradigm was adopted to enable the researchers to interpret and “make sense” of the research context, thus able to provide an understanding with regards to the participants’ perceptions of Lesson Study. Multiple methods were employed for the data collection. The researchers made field notes based on their observations while the participants were encouraged to write their self-reflection. The lesson plan developed was also taken as part of the data collection. At the end of the Lesson Study cycle, clinical interviews were conducted with the two participants that provided the bulk of the data. In-depth semi-structured questions were posed to gauge the participants’

thoughts, beliefs and perceptions of the Lesson Study. The discussions of the lesson plan as well as clinical interviews were audio-taped while the two classroom teachings were video-taped. The qualitative data collected was then transcribed in the text format and the technique of content analysis was employed in this study.

The two participants, Wendy and Fei (both pseudonym) were assigned to the same school which is approximately 40 km from the teacher education institute. The participants met twice (dated 7 August and 14 August) with the researchers at the institute premise to discuss and plan a lesson plan. Both the researchers facilitated the discussion sessions with the participants concern. The topic chosen was *Time* whereby the Year 3 pupils were required to read, understand and write any given time to them. Subsequently, Wendy taught the planned lesson on 28 August which was observed by Fei and one of the researchers. The reflection of the lesson and modification of the lesson plan was conducted on the following day at the teacher education institute. Later, Fei taught the modified lesson plan on 8 September in another class which was observed by Wendy and the other researcher. Subsequently, reflection of the lesson was held at a later time on the same day at the school premise. Due to time constraint, only one Lesson Study cycle was implemented.

## 5 FINDINGS AND DISCUSSION

Apparently, Wendy and Fei were both novice in Lesson Study. Perhaps, the workshop conducted did not convey clearly the notion and concept of Lesson Study when Fei expressed the following, “*I actually have problem with Lesson Study. The first teaching, Wendy teaches in the good class but I have to modify it for my weaker students. If not suitable, do we have to modify again? Then how? We keep changing it and there is no end*” (Interview: 18/09/14). In our context, Lesson Study is about learning process for teachers and not an end product – lesson plan as perceived by Fei.

The analysis of the data were mainly derived from the clinical interviews with Wendy and Fei. The focus of this paper is to reveal the basis why Wendy and Fei had demonstrated positively towards Lesson Study. More importantly, they had vowed to continue doing it voluntarily despite their course mates continuing to shy away in the second practicum. The findings may then provide some fruitful information and perhaps suggestions for Lesson Study to be incorporated in the teaching

practicum in near future. The distinct strands that emerged from the analysis are: (i) more brains, more ideas, (ii) making lessons more interesting, and (iii) promoting reflective practice.

### More brains, more ideas

Wendy and Fei seemed to appreciate Lesson Study very much because it helped them to plan “good” lesson plan. As Fei said, “*Very good sir. Because first thing it is not based on your idea only. When create lesson plan, we get so many ideas. The idea is out of the box, I mean more creative that we did not think about it before this. When we discuss, maybe we can get ideas that we may not think about it*” (Interview: 18/09/14). For instance, she cited that prior to the Lesson Study discussions, she did not has the idea of producing clocks [teaching aids] that allow the students to draw on it. Fei recalled that the discussions made her to get new ideas easier. “*When we start this practicum, doing lesson plans . . . I felt difficult but when we have more heads, then it’s easier.*” (Fei, interview: 18/09/14).

Wendy admitted that the Lesson Study had somehow changed her strategy to teach the lesson of Time, “*Initially, maybe I will use slides only but then Fei suggested the idea to use the real clock. At first, I think it is difficult to use real clock but then when I use it, it’s ok*” (Interview: 18/09/14). Naturally, through the Lesson Study discussions, they were supported to think in-depth as they engaged actively with the researchers. This actually improved their ability to make better pedagogical decisions. The collaborative structure of Lesson Study allows them to come to joint understandings, such as effective teaching strategies for a particular lesson. This actually improved their ability to make better pedagogical decisions. Lesson Study, thus provided a venue for teachers to discuss and share their instructional strategies. Wendy admitted, “*After trying out Lesson Study, maybe idea from one person is not very good. Maybe other people ideas are better than us*” (Interview: 18/09/14).

### Making lessons more interesting

As both Wendy and Fei were novice in real teaching context, they struggled to prepare very detailed lesson plans as required in the practicum. Hence, one main concern was inadequate time and knowledge to prepare these lesson plans. Coincidentally, the Lesson Study conducted seemed to provide great help to both the participants to plan and write their lesson plans. Fei became interested in

doing Lesson Study as it really helped her to plan interesting activities. She explained, “*When students have problem, we can get more ideas. We can actually get idea on the spot to overcome problems. If doing it (lesson plan) alone, the activities may be boring but when we suggest and modified it, the lesson will be more interesting*” (Interview: 18/09/14).

For Wendy, she never regretted to engage in Lesson Study, “*Throughout my involvement, I feel like very helpful. Sometimes, maybe my ideas not really be able to help students. So we need help from our partner to give ideas. Because when discuss together, not only teaching ideas but ideas how to help the students*” (Interview: 18/09/14). Both participants were thrilled when they were able to get ideas about activities that helped to solve students’ learning problem.

### Promoting reflective practice

Research studies indicated that Lesson Study provides the venue and opportunity for teachers to develop their ability to see a lesson from the student’s perspective. This is one of the important goals in Lesson Study which Lewis (2002) referred as developing “*the eyes to see children.*” In taking part in Lesson Study, the participants either consciously or unconsciously became more aware of their students’ learning. As Fei reflected after the Lesson Study, “*After this first and second practicum, I realised some differences (to me). Now, even without the group discussion, when I write and prepare lesson plans, I already used to think. My brain has automatically thinking how to make it (lesson plan) better.*” (Interview: 18/09/14). As for Wendy, she realised her weaknesses in teaching through Lesson Study process. She explained, “*Like when I observed Fei’s teaching, I see my limitations and weaknesses. When the lesson plan is modified, I realised it is better for Fei’s class*” (Interview: 18/09/14).

Through the Lesson Study process, there was an overall improvement in the second teaching compare to the first one. Wendy acknowledged that the second teaching by Fei achieved better result than her first lesson. Most of the students were able to read the time as more time was allocated in the second teaching after their reflection of the first teaching. With continuous support from peers during the Lesson Study process, the participants were able to make self-reflection and this develop further their awareness towards students’ learning. This showed that the Lesson Study process is able to assist trainee

teachers in planning and writing up of their lesson plans more effectively during practicum.

## 5 CHALLENGES FOR LESSON STUDY IMPLEMENTATION

There seems to be a strong perception that Lesson Study is an extra task if it is mandated to the pre-service teachers. The fact that only 3 out of 41 trainee teachers carried out Lesson Study voluntarily suggested many challenges ahead. After the Lesson Study workshop, Fei seek more details from the researchers as she was unclear how to carry out Lesson Study with her friends. In fact, she was not aware that it is not compulsory. She explained, *“Initially, we don’t want. I mean in the first practicum. But because we thought it is compulsory, then only we come and meet sir. We are not really sure (Lesson Study). It is a mistake actually (that Lesson Study is compulsory). We just try it and it seems ok. Coincidentally, it turn out to be a good thing for us”* (Interview: 18/09/14). Finally, Fei was glad and she offered her justification for her course mates who shy away from Lesson Study. She explained, *“Because . . . first, they have not try it yet, so they don’t know. They must go through the process, and then only they know how important this Lesson Study. Must force it initially”* (Interview: 18/09/14). As such, probably it would be a strategic move to make it compulsory for the trainees to engage in Lesson Study so as to soak them with the *“real feeling”* of Lesson Study. According to Guskey and Sparks (1996), professional development activities may change teachers’ teaching, in turn change students’ learning that ultimately change teachers’ attitude and perceptions towards professional development. Wendy felt that Lesson Study is not a burden for her but indecisive if it should be made compulsory for the trainee teachers in their practicum. *“For me it’s not a burden, we can do it with our partners. When we discuss, we can ask others. Maybe for other people, maybe a burden”* (Wendy, interview: 18/09/14).

Nonetheless, for the practising teachers in schools, Wendy and Fei shared similar view that it depends much on the teachers’ own desires and attitudes. As Wendy said, *“Lesson Study is possible if they are willing to do. Some teachers would complain because they also have many other works to do.”* (Interview: 18/09/14). Fei echoed, *“Teachers have different life style, some have to care for their families. This is a cluster school. Not only in the class, there are a lot of works till they cannot enter the class (no time). If they do Lesson Study, it is just adding extra work”* (Interview: 18/09/14). Under

such circumstances in school, Wendy and Fei did not attempt to involve their supervising teachers as they will likely be reluctant participants. Consequently, even though Wendy and Fei were at school for only a brief period, they expressed two factors: *time constraint* and *workload of teachers* as the main challenges to implement Lesson Study in the Malaysian schools. These perceptions are consistent to many local research studies concerning Lesson Study (such as Goh, 2007; Chiew, 2009). Hence, even though Lesson Study is perceived positively in the context of professional development, the actual implementation would likely to face challenges and constraints.

## 6 CONCLUSION

Based on the findings and outcomes, we deduced that the participants have developed favourable and positive perceptions on Lesson Study. Specifically, their perceptions changed after they had personally experienced it. As revealed earlier, Fei was reluctant initially but soon become comfortable with the support of researchers as knowledgeable others.

Lesson Study, if practiced willingly by trainee teachers will in long term improve the quality of teaching. It has the potential to change prospective teachers’ beliefs and attitudes towards effective teaching practices as highlighted in most research studies. Lesson Study is unique in the Malaysian education context, in the sense that it is teacher-directed and bottom-up approach of professional development. To implement and sustain Lesson Study in Malaysia, a paradigm shift of teachers’ mindset and attitude would absolutely necessary. To date, it has never been easy to recruit neither the pre-service nor the in-service teachers to voluntarily participate and form Lesson Study group. In fact, Lesson Study is very relevant in the context to promote and cultivate the concept of lifelong learning in the teaching profession. Therefore, perhaps the practice of Lesson Study ought to be initiated and promoted at the pre-service level in the teacher education programme. However, to implement Lesson Study as part of the teacher education programme would require much effort and planning from the relevant educational authorities. This ultimately will lend support for Lesson Study to be implemented in the schools.

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## Infusing Narrative and Reflective Elements in Argumentative Writing

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**Abstract:** The aim of our research lesson was to help our students to infuse and develop personal voice in their argumentative writing so as to improve their persuasiveness. A shift towards expository rather than narrative writing has been observed in the new GCE ‘O’ Level English Language examination syllabus. Therefore, there is a need to teach our students the necessary skills and strategies for them to express their opinions and arguments effectively. Most of our students show positive attitude and interest towards argumentative writing but their essays are often flat, disengaged pieces of writing where arguments are simply stated and seldom argued. Thus our team designed a lesson to help students infuse their personal voice in their writing so that their essays would be more authentic and persuasive.

**Keywords:** expository, writing, argumentative

### 1 Background Information and Research Goals

Clementi Town Secondary School is a government school that houses three education streams - Express, Normal Academic and Normal Technical. The school typically admits students with a PSLE aggregate range of 231 to 246 for Express students, 181 to 199 for Normal Academic students and 141 to 156 for Normal Technical students. There are usually 4 Express Classes, 2 Normal Academic and 1 Normal Technical class per level. Our students hail from varied family backgrounds, and are generally competent in conversational English.

Although students are fairly able to write an expository essay, they lack the personal voice in the development of their viewpoint, making their essay sound too contrived at times. Due to this, students often struggle to persuade readers into accepting their stand on any given topic.

Another concern we had with our students was that many of them are now very dependent on the PEEL template. Students feel that the PEEL template is the only way to write an expository essay. Some students do not even explain their points clearly and do not give a proper example to support their viewpoint.

#### 1.2 Broad goal for students and the research team’s aim

While the students are generally able to cope with the English Language examinations, the arguments, as felt by the team, possess much potential to be developed. Hence, our research team decided to focus on guiding our students to infuse personal

voice in their writing so as to improve the persuasiveness of their writing and encourage students’ self-expression.

### 2 Overview of Lesson

To cater to students who are still relatively new to expository writing, the lesson employs predominantly explicit teaching and the modelling method to get students accustomed to the three things that we will be emphasising on to improve their writing. They are: utilizing a personal voice, emotive words as well as a more narrative mode of elaboration. This is followed by group construction so that students can discuss, work collaboratively and clarify any doubts, without feeling apprehensive that they will be judged and graded personally. Lastly, the students will embark on individual construction, where the teacher can assess how much the students have learnt.

Prior to the lesson, the teacher will conduct a non-intimidating brainstorming session to get the students used to vocalising their opinion so as to prepare them for group work.

### 3 Research Lesson Instructional Plan

Steps of the lesson: learning activities and key questions (and time allocation)	Student activities/expected student reactions or responses	Teacher’s response to student reactions/Things to remember	Goals and Method(s) of evaluation
<p><b>1) Pre-lesson</b> (<i>conducted before study lesson</i>)</p> <ul style="list-style-type: none"> <li>Lead-in activity (5 mins): TR to ask students about their views regarding school uniforms, why school uniforms are necessary</li> <li>TR gives class a prompt (<i>It is said that school uniform gives pupils a sense of identity and encourages good discipline. Do you agree?</i>) and get students to discuss their views with their peers</li> <li>Teacher goes through a recap of the 5 paragraph structure for expository writing and PEEL format for paragraphs</li> <li>In groups of 4, students construct 2 PEEL paragraphs (one on sense of identity and one on good discipline) and submit to TR.</li> </ul>	<p>Students may give responses like “identify students from a school”, “make sure everyone is the same”</p> <p>Students who agree may say their uniforms are unique and so help identify others of the school they are from, or that they will be more mindful of their behaviour when in uniform. Students who disagree may say that they don’t like the uniform and so don’t like to be associated with the school.</p> <p>Students recall what they understand by the PEEL structure: Main point, elaborate, evidence and link</p> <p>Students may not be clear about what PEEL when attempting to write about school uniforms. They may put P as the question about school uniforms.</p>	<p>Teacher to encourage vibrant brainstorm of ideas and facilitate students’ participation</p> <p>Teacher to ensure that students engage in active discussion or debate with their peers and arrive at their own opinion.</p> <p>Teacher to give further examples of P, E, E, L for students to reinforce what PEEL is about.</p> <p>Teacher to explain that the P is one of the reasons for them agreeing or disagreeing that school uniforms inculcates discipline and instils belonging.</p>	<p>Students are enthusiastic to speak up and give suggestions</p> <p>Students form their own opinion on whether they agree or disagree with the topic</p> <p>Students are able to apply the structure of PEEL correctly when planning their paragraph.</p>
<p><b>2) Study Lesson</b></p> <ul style="list-style-type: none"> <li>(Before start of lesson, TR chooses one group’s body paragraph - preferably one of the better ones and put it up on word document / powerpoint slides)</li> </ul>	<p>Students should feel that teacher is giving them relevant feedback. They might be curious about the owner of the work.</p>	<p>Teacher to give affirmation and compliment students for their good effort.</p>	

Steps of the lesson: learning activities and key questions (and time allocation)	Student activities/expected student reactions or responses	Teacher’s response to student reactions/Things to remember	Goals and Method(s) of evaluation
<ul style="list-style-type: none"> <li>(10 mins) TR to show class the student group’s paragraph on sense of identity and ask them to critique/comment.</li> <li>(15 mins) TR then show how this paragraph can be improved. For each of student’s sentence, TR demonstrates how it can rewritten for improvement. (Teach students to avoid repeating question wording, use pronoun ‘I’ when stating opinion, use strong evocative words to express attitude and opinion, provide anecdotal evidence to support topic sentence)</li> <li>(15 mins) In groups, students work on improving the 2<sup>nd</sup> body paragraph about school uniforms inculcating identity in students</li> <li>TR to model how 2<sup>nd</sup> body paragraph can be improved.</li> <li>Students then try to follow the strategies and improve another paragraph individually (based on good discipline)</li> </ul>	<p>Students express their opinion on whether they like the paragraph or not, and the reason why.</p> <p>Students to copy the recommendations made by the teacher.</p> <p>Collaboratively, students engage in active discussion to recall and apply what they just learnt into a piece of group writing</p> <p>Individually, students can copy teacher’s model answer or improve on their group work</p> <p>Individually, students work on their own body paragraph about school uniforms and good discipline</p>	<p>Teacher to validate and ride on students’ opinions while teaching the strategies for writing a good body paragraph</p> <p>Teacher to validate students’ own creation</p> <p>TR to monitor group activity in the classroom and clarify or render help if necessary</p> <p>TR to monitor individual writing in the classroom and clarify or render help if necessary</p>	<p>Group can complete elaborating a paragraph based on the techniques taught earlier</p> <p>Individual can complete elaborating a paragraph based on the techniques taught earlier</p>

## 4 Observation Guide

Based on the team goals and research questions, we have selected the following questions for observers to consider during the lesson. These questions will also be the topics discussed at the post-lesson discussion.

- Are students able to use the PEEL format to craft their body paragraph?
- Are students expressing their personal viewpoints through the use of personal pronouns?
- Do students use strong modals and emotive vocabulary to express their opinions?
- Do students use story-telling techniques to improve student engagement?

When observing the lesson, we requested that observers follow these protocols:

- Focus on student actions and behaviours within the classroom.
- Limit notes and scripting to factual information and quantitative data; avoid judgmental comments.
- Circulate freely when students are working individually or in groups, but move to the side or back of the room during whole-class discussion.
- Make sure they are not blocking students' view.
- Refrain from interaction, teaching, or assisting the students in any way. Occasional interaction is permissible if done discreetly and with the purpose of understanding student thinking.
- Take detailed notes throughout the lesson.
- Take notes on individual students' responses, using the student's names.
- Record how students begin their work and approach the tasks.
- Record interactions between students and between students and the teacher.
- Document common misunderstandings the students had and when their understanding changed.
- Indicate how individual students constructed their understanding through activities and discussions.

## 5 Observations and Post-lesson Analysis

After the pre-lesson activity where students were supposed to construct 2 PEEL paragraphs to argue

their stand for the given prompt, the teacher realised from the students' submission that many of the students have a wrong understanding of PEEL format. Many of them thought that 'P' refers to the stand that they wish to take, but it actually refers to the main point or the topic sentence of the paragraph to support the stand. Thus many started off their paragraph with a statement of their stand (whether they agree or disagree with the statement) instead of the reason why they agree or disagree. As a result, the teacher had to reteach the PEEL structure as part of the planned research lesson to correct their misconceptions.

The students were then taught the techniques to infuse personal voice in their writing. After that, they were asked to write a PEEL paragraph about their view on whether wearing school uniform encourages good discipline. It was observed that most students attempted to use these techniques in their writing. However, a number of students still did not infuse their own personal opinions or experiences to support their stand, when the topic is clearly one that is close to their hearts. One example is the lack of personal pronouns in the writing:

*“School uniforms encourage good discipline because the students who wear the uniform try not to misbehave and do anything bad in public. When the students wear the uniform, they are reminded that they are representing their school and that anything they do, the public will see and report to the school or base the students' misbehaviour on the school. If a student from the school wears the school uniform, while another from the same school did not, and they both committed a crime, the public will first inform the school about the boy in the uniform. Therefore, I think school uniforms encourage good discipline as students do not wish to disgrace their whole school in public.”*

In terms of the content and persuasiveness of their arguments, the team also found such qualities lacking in the students' writing. Students who did try to make use of person pronouns to evoke personal voice ended up writing responses that feel contrived and do not reflect their true opinions on the subject:

*“I agree to a great extent that school uniforms encourage good discipline. Whenever I wear my school uniform in public, I feel like a representative of Clementi Town Secondary School. Whether I do a good or bad deed, the public will recognise me as a student of the school and judge all other*

*Clementeens to be the same like me. I do not want the public to assume that CTSS is a bad school with bad behaving students because of me, as that would make me feel extremely guilty. Therefore, whenever I wear my school uniform, I must remember to always be on my best behaviour."*

When asked by the teacher whether their writing reflects their true opinion, a number of students voiced out that they did not really share the same feelings as what they had written.

The above observations suggest that the students are still not confident in expressing their own viewpoints, and are very dependent on a fixed structure for their writing. When provided with a scaffold, many are unable to modify or adapt the scaffold to their own style of writing.

## 6 CONCLUSIONS

During the post-lesson discussion, the team concurs that a stand-alone lesson is not enough to change students' writing habits and influence them to become more confident in self-expression. Our students need more opportunities to share their personal thoughts and reflections in writing, and this could be done through various platforms such as journal writing, blogging or forum discussions. The team also recommends a review of the English curriculum to introduce personal reflective essay writing at Secondary One level, and only introducing argumentative writing at Secondary Two. This would allow a spiral progression of skills in the student, from being able to reflect on personal biases to expressing one's personal opinions and supporting arguments with factual and anecdotal evidence.

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## Meningkatkan Kualitas Proses Pembelajaran Bilangan Berpangkat dan Bentuk Akar melalui Permainan Kartu Bilkat

(Kajian terhadap Open Lesson dua siklus kelas VII pada Lesson Study Berbasis Sekolah di SMP Negeri 1 Tomo)

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**Abstrak:** Bilangan berpangkat dan bentuk akar merupakan materi prasyarat untuk pembelajaran Matematika selanjutnya, maupun sebagai penunjang mata pelajaran lain, seperti Ilmu Pengetahuan Alam dan Ilmu Pengetahuan Sosial. Sehingga penguasaan materi ini harus benar-benar memadai, jika tidak pembelajaran selanjutnya akan menghadapi kendala. Tetapi melihat kondisi pembelajaran bilangan berpangkat dan bentuk akar saat ini, menunjukkan bahwa pembelajaran kurang menggembirakan. Proses pembelajaran tidak menggairahkan, tidak menarik dan menjemukan. Pembelajaran bilangan berpangkat dan bentuk akar dengan menggunakan kartu BILKAT telah mengubah situasi pembelajaran. Pembelajaran menjadi bersemangat dan bergairah, terjadi kolaborasi dan kompetisi antar siswa. Data kualitas proses pembelajaran, tes uji pemahaman dan motivasi belajar menunjukkan peningkatan yang menggembirakan. Kualitas proses pembelajaran pada siklus I mencapai 83,6 dan siklus II mencapai 88,9 kedua-duanya berada pada kategori baik. Hasil pembelajaran memperoleh rata-rata 89,4 pada siklus I dan 90,9 pada siklus II. Ketuntasan belajar mencapai 93,5% pada siklus I dan 100% pada siklus II. Motivasi belajar pada siklus I mencapai 84,7 dan siklus II mencapai 86,9 kedua-duanya berada pada kategori baik. Kendala terjadi diawal permainan, permainan berjalan lamban. Dan ketika akan tes uji pemahaman, hampir semua siswa tidak mau menghentikan permainan. Mereka bukan menolak melaksanakan tes, tetapi mereka asyik dan ingin terus bermain kartu BILKAT.

**Kata kunci :** proses pembelajaran, bilangan berpangkat, bentuk akar, kartu BILKAT.

### 1. PENDAHULUAN

#### a. Latar Belakang Masalah

Bilangan berpangkat dan bentuk akar selain merupakan pengetahuan prasyarat untuk materi selanjutnya, juga merupakan materi penunjang mata pelajaran lainnya, terutama mata pelajaran Ilmu Pengetahuan Alam dan Ilmu Pengetahuan Sosial. Seperti kita ketahui, bahwa; ketika pengetahuan prasyarat belum dikuasai, maka untuk menguasai pengetahuan selanjutnya akan menghadapi beberapa kendala. Kendala umum yang sering kita jumpai adalah kesulitan untuk memahami materi selanjutnya. Selain itu ada dampak lain yang lebih bahaya dari kesulitan itu sendiri, yakni dampak psikologis. Mungkin siswa akan mengalami tekanan mental, malu dengan sesama temannya dan berasumsi bahwa matematika itu sulit. Bukan hal yang mustahil jika akhirnya siswa membenci segala sesuatu yang ada kaitannya dengan Matematika, dan tidak ada lagi motivasi untuk belajar Matematika.

Hal seperti ini terjadi hampir disemua kelas, masih banyak diantara mereka yang menjawab  $2^3 = 6$  dan  $3^2 = 6$ , ada juga siswa yang menjawab  $2^3 = 2 \times 2 \times 2 = 6$ . Siswa yang lainnya menjawab  $2^3 = 8$

dan  $3^2 = 9$  tanpa penjelasan. dan hanya beberapa siswa yang menjawab  $2^3 = 2 \times 2 \times 2 = 8$  dan  $3^2 = 3 \times 3$ . Hal ini menunjukkan betapa rendahnya pemahaman konsep perpangkatan pada mereka, walaupun secara teori materi ini sudah diberikan di Sekolah Dasar. Selain pemahaman konsep perpangkatan yang belum memadai, suasana pembelajaran di kelas pun seperti kehilangan semangat, lesu dan tidak bergairah. Materi pembelajaran sepertinya tidak menarik bagi mereka. Mereka belajar tidak sungguh-sungguh, seolah-olah tidak memiliki tujuan yang jelas, apa yang diharapkan dari pembelajaran tersebut. Interaksi antar siswa hampir dikatakan tidak ada, begitu juga interaksi antara siswa dengan guru. Komunikasi hanya terjadi satu arah dari guru ke siswa.

Berdasarkan permasalahan di atas, maka perlu mencari solusi supaya pembelajaran lebih menarik dan bersemangat, tercipta kesungguhan dalam belajar, materi dipahami dengan baik dan memberikan kesan bahwa Matematika itu menyenangkan. Salah satu cara yang bisa dilakukan adalah dengan menerapkan metode dan media pembelajaran yang bisa membantu meningkatkan

semangat dan kesungguhan dalam belajar sehingga siswa bisa belajar dengan maksimal.

Sebagai guru, saya berupaya mencari alternatif yang paling tepat dengan memanfaatkan metode dan media pembelajaran. Dan dalam penelitian kali ini saya menggunakan metode permainan dengan media kartu bilangan berpangkat (BILKAT).

### **b. Rumusan Masalah**

Rumusan masalah pada penelitian tindakan ini adalah:

- (1) Apakah permainan kartu BILKAT dapat meningkatkan kualitas proses pembelajaran dalam pembelajaran bilangan berpangkat dan bentuk akar?
- (2) Apakah permainan kartu BILKAT dapat meningkatkan hasil belajar siswa pada materi bilangan berpangkat dan bentuk akar?
- (3) Apakah permainan kartu BILKAT dapat meningkatkan motivasi siswa untuk belajar bilangan berpangkat dan bentuk akar?

### **c. Tujuan Penelitian**

Berdasarkan rumusan masalah di atas, maka tujuan penelitiannya adalah:

- (1) Untuk mengetahui seberapa besar permainan kartu BILKAT dapat meningkatkan kualitas proses pembelajaran dalam pembelajaran bilangan berpangkat dan bentuk akar.
- (2) Untuk mengetahui seberapa besar permainan kartu BILKAT dapat meningkatkan hasil belajar siswa pada materi bilangan berpangkat dan bentuk akar.
- (3) Untuk mengetahui motivasi siswa terhadap pembelajaran bilangan berpangkat dan bentuk akar dengan metode permainan kartu BILKAT.

### **d. Manfaat Penelitian**

Manfaat hasil penelitian tindakan kelas ini bagi siswa diharapkan dapat meningkatkan semangat belajar siswa, dapat meningkatkan penguasaan siswa pada materi bilangan berpangkat dan bentuk akar dan menumbuhkan kesan yang baik terhadap Matematika. Bagi guru diharapkan dapat merancang pembelajaran Matematika yang efektif, dan dapat meningkatkan kemampuan guru dalam memilih model, metode dan media pembelajaran yang menarik, sehingga hasilnya optimal.

## **2. KAJIAN TEORI**

### **a. Bilangan Berpangkat dan Bentuk Akar**

Bilangan berpangkat dan bentuk akar diajarkan di

Sekolah Dasar, Sekolah Menengah Pertama maupun di Sekolah Menengah Atas. Materi ini memiliki tingkat keabstrakan cukup tinggi. Sulit untuk dibuatkan pemodelannya. Jangankan dibuatkan model/alat peraga yang kongkrit yang semi kongkritpun sulit. Sehingga materi ini merupakan salah satu materi yang sulit dibelajarkan kepada siswa. Tetapi guru harus berusaha agar materi ini mudah dan menarik untuk dipelajari siswa. karena materi ini merupakan pengetahuan prasyarat untuk pelajaran selanjutnya. Sri Wardhani (2010 : 24): “objek kajian matematika yang abstrak itu perlu disiasati agar mudah dipelajari siswa.”

Mengingat materi yang abstrak ini merupakan pengetahuan prasyarat untuk pelajaran selanjutnya, maka upaya maksimal agar siswa menguasai dan memahami materi ini menjadi suatu keharusan. Jika tidak, siswa akan berhadapan dengan berbagai kesulitan dalam pembelajaran selanjutnya. Sri Wardhani (2010 : 22) mengemukakan: “Pemahaman siswa dalam belajar matematika yang diperoleh sebelumnya sangat berpengaruh terhadap diperolehnya pemahaman berikutnya. Siswa yang penguasaan kompetensinya baik akan cenderung lancar dalam mempelajari kompetensi berikutnya dan sebaliknya.” Seorang siswa akan sulit memahami materi selanjutnya jika materi sebelumnya yang merupakan pengetahuan prasyaratnya belum dipahami secara memadai.

### **b. Permainan Matematika**

Metode permainan dalam pembelajaran matematika adalah suatu metode belajar dimana kualitas proses pembelajaran dilakukan dengan cara atau dalam suasana bermain. Ada beberapa definisi metode permainan yang dikemukakan oleh beberapa orang ahli, diantaranya adalah:

- (1) Sriyono mengatakan: metode permainan matematika merupakan kegiatan yang menyebabkan siswa senang dan asyik dalam mempelajari matematika.
- (2) Menurut (Ruseffendi, 2006 : 312), Metode permainan matematika adalah sesuatu kegiatan yang menyenangkan (menggembirakan) yang dapat menunjang tercapainya tujuan instruksional dalam pengajaran matematika baik aspek kognitif, afektif, maupun psikomotorik

Metode permainan dapat menciptakan suasana belajar yang dinamis, penuh semangat, bergairah, dan antusias. Metode permainan juga dapat digunakan untuk mengubah suasana belajar dari pasif ke aktif, dari diam menjadi gerak, dari kaku menjadi fleksibel, dari jenuh menjadi riang. Metode permainan dapat menciptakan suasana belajar yang menyenangkan, serius, dan terarah.

### c. Kelebihan dan Kelemahan Metode Permainan

Metode permainan memiliki beberapa kelebihan dan kelemahan, seperti yang dikemukakan oleh Estiprastikaningsih (2013). Kelebihan dari metode permainan adalah:

- (1) Melatih anak untuk mendramatisasikan sesuatu serta melatih keberanian.
- (2) Metode ini akan menarik perhatian anak sehingga suasana kelas menjadi hidup.
- (3) Anak dapat menghayati suatu peristiwa sehingga mudah mengambil kesimpulan berdasarkan penghayatan sendiri.
- (4) Anak dilatih untuk menyusun pikirannya dengan teratur.

Sedangkan kelemahan dari metode permainan adalah:

- (1) Tidak semua topik dapat disajikan melalui metode permainan.
- (2) Memerlukan banyak waktu
- (3) Penentuan kalah menang dan bayar-membayar dapat berakibat negatif
- (4) Mungkin juga terjadi pertengkaran
- (5) Mengganggu ketenangan belajar di kelas-kelas lain.

### d. Manfaat Metode Permainan

Banyak manfaat metode permainan dalam meningkatkan pembelajaran matematika. Ruseffendi (2006: 312) mengatakan, bahwa manfaat metode permainan dalam pelajaran matematika ialah:

- 1) menimbulkan dan meningkatkan minat.
- 2) menumbuhkan sikap yang baik terhadap matematika.
- 3) untuk mengembangkan konsep.
- 4) untuk melatih keterampilan
- 5) untuk penguatan.
- 6) untuk memupuk kemampuan pemahaman
- 7) untuk pemecahan masalah
- 8) untuk mengisi waktu senggang.

Sedangkan menurut Diner (dalam Lisnawaty, 1993: 91) mengatakan, bahwa dengan mengaitkan bermain dengan pelajaran matematika siswa akan:

- (1) berkenalan dengan konsep matematika melalui benda-benda konkrit.
- (2) menambah atau memperkaya pengalaman peserta didik.
- (3) tertanam konsep matematika pada peserta didik.
- (4) dapat menelaah sifat bersama atau dapat membedakan antara dua jenis benda.

- (5) mampu mengatakan representasi suatu konsep dengan belajar membuat simbol.
- (6) belajar mengorganisasikan konsep-konsep matematika secara formal sampai pada aksioma dalil atau teori.

### e. Kartu BILKAT Bilangan Berpangkat

Kartu BILKAT adalah seperangkat kartu yang berisikan bilangan-bilangan berpangkat yang didesain sedemikian rupa, sehingga mirip dengan kartu domino. Adapun rancangannya adalah sebagai berikut:

- (1) ukuran sama dengan ukuran kartu domino
- (2) banyaknya kartu BILKAT dalam satu set ada 28 kartu
- (3) warna disesuaikan dengan keinginan, tetapi satu set dalam satu warna
- (4) Bahan: kertas karton

### f. Cara Permainan

Metode permainan sama halnya dengan metode permainan kartu domino. Bermain kartu BILKAT dapat dengan cara terusan dengan tanpa perhitungan, tetapi dapat juga dengan perhitungan agar dapat ditentukan pemenang dari permainan tersebut.

## 3. METODOLOGI PENELITIAN

Penelitian tindakan kelas ini dilaksanakan dalam 2 siklus di kelas IX A Sekolah Menengah Pertama Negeri 1 Tomo, semester ke-2 tahun pelajaran 2013-2014. Masing-masing siklus terdiri dari 2 kali pertemuan @ (2x40') sesuai jadwal pelajaran. Siklus I untuk materi bilangan berpangkat bulat dan siklus II untuk bilangan berpangkat pecahan/akar. Pembelajaran dilaksanakan dengan berkelompok, yang tiap kelompoknya beranggota 4 orang. Kegiatan pertemuan pertama: siswa belajar konsep bilangan berpangkat positif, nol dan negatif dengan diskusi dan tanya jawab, kemudian dilanjutkan dengan permainan kartu BILKAT, pertemuan kedua: langsung bermain kartu BILKAT dilanjutkan dengan tes dan pengisian angket siswa. Siklus II untuk bilangan berpangkat pecahan/akar; dengan kegiatan: siswa belajar konsep bilangan berpangkat pecahan /bentuk akar dengan diskusi dan tanya jawab, kemudian dilanjutkan dengan permainan kartu BILKAT, pertemuan kedua: langsung bermain kartu BILKAT dilanjutkan dengan tes dan pengisian angket siswa. Penelitian difokuskan kepada kualitas proses pembelajaran, hasil belajar dan motivasi siswa terhadap pelaksanaan pembelajaran matematika. Yang



bertindak sebagai pengamat adalah 3 orang teman sejawat.

Data kualitas proses pembelajaran diperoleh melalui observasi pada pelaksanaan tindakan, dilaksanakan oleh 3 orang pengamat dengan menggunakan rating scale. Data hasil belajar siswa diperoleh melalui tes pada akhir tiap siklus dengan soal bentuk uraian. Data motivasi siswa terhadap pembelajaran diperoleh melalui pengisian angket, yang dilaksanakan diakhir tiap siklus, diisi oleh tiap siswa. Indikator keberhasilan penelitian, mengadopsi pendapat Ridwan Saadah (2000) tentang kriteria keberhasilan pembelajaran yang sesuai dengan tujuan Penelitian Tindakan Kelas ini, yaitu dengan perolehan skor dalam prosentase (%) sebagai berikut :

- $\geq 80$  : sangat tinggi
- 60 – 79 : tinggi
- 40 – 59 : cukup
- 20 – 39 : rendah
- $< 20$  : sangat rendah

Untuk tindakan kali ini penulis menargetkan keaktifan, hasil belajar dan motivasi siswa mendapatkan kategori tinggi. Sedangkan untuk hasil belajar, penulis mengadopsi dari apa yang dikemukakan oleh H. Erman (2003 : 11) dalam R. Gita Ardhy Nugraha (2014),: “ketuntasan belajar suatu kelas belum mencapai 80% perlu diadakan diagnostik dan remedial sebelum materi dilanjutkan.” Jadi target hasil belajar dalam penelitian tindakan kelas kali ini adalah banyaknya siswa yang memenuhi dan atau melampaui kriteria ketuntasan minimal mencapai 80%.

#### 4. HASIL PENELITIAN

##### 4.1 Hasil Penelitian Siklus I

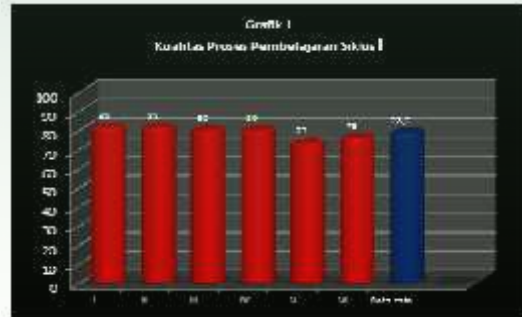
Data proses pembelajaran siklus I dapat dilihat pada table berikut:

Tabel 1. Kualitas Proses Pembelajaran Siklus I

No	Aspek	Kelompok					Presentase	
		I	II	III	IV	V		
1	Dasar dan konsep belajar pembelajaran	3	13	2	10	0	11	76
2	Interaksi antar siswa	3	13	4	15	12	14	64
3	motivasi belajar siswa dan disiplin	2	13	2	12	2	9	73
4	Tempo dan waktu dalam kegiatan pembelajaran	3	13	1	11	0	13	59
5	Sarana pembelajaran	3	13	2	15	10	11	58
	Rata-rata	27	81	10	60	14	15	78,7%

Nilai tertinggi untuk kualitas proses pembelajaran pada siklus I dengan rata-rata prosentase 81% diperoleh kelompok I dan nilai terendah dengan rata-rata prosentase 73% diperoleh kelompok V. Rata-rata kualitas proses pembelajaran siklus I mencapai 78,7%, dengan

kategori tinggi. Jika data tersebut dibuat dalam bentuk grafik, maka akan terlihat seperti berikut:



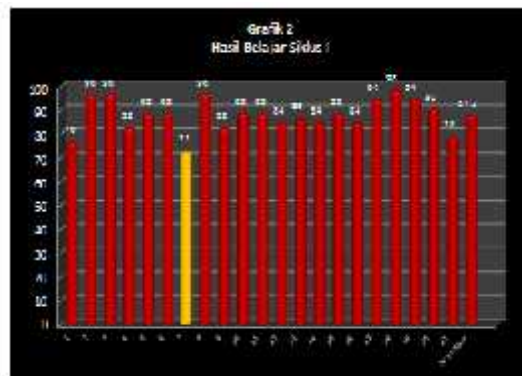
Data hasil belajar siklus I dapat dilihat pada tabel berikut:

Tabel 2. Hasil Belajar Siklus I

No	Nama	L.P	Nilai					Nilai Rata-rata	KET	
			1	2	3	4	5			
1	Angga Maulana	P	90	80	100	90	90	90	T	
2	Arif Nur Hafid	P	90	100	100	90	100	94	T	
3	Arya Pratomo	L	100	100	100	100	100	100	T	
4	Alvin Pratomo	L	90	90	100	90	90	90	T	
5	Amir Shamsudin M	P	90	100	100	100	100	94	T	
6	Amir Agiliani	P	90	90	90	100	100	90	T	
7	Alvin Pratomo	L	90	100	100	90	100	94	T	
8	Alvin Pratomo	L	90	100	100	100	100	94	T	
9	Alvin Pratomo	P	90	100	100	100	100	94	T	
10	Khalid Anwar	P	90	100	100	100	100	94	T	
11	Alvin Pratomo	L	90	100	100	100	100	94	T	
12	Alvin Pratomo	L	90	100	100	100	100	94	T	
13	Alvin Pratomo	P	90	90	90	90	100	94	T	
14	Alvin Pratomo	P	90	100	100	100	100	94	T	
15	Alvin Pratomo	P	90	100	100	100	100	94	T	
16	Alvin Pratomo	P	90	90	100	90	100	94	T	
17	Alvin Pratomo	L	90	100	100	100	100	94	T	
18	Alvin Pratomo	L	90	100	100	100	100	94	T	
19	Alvin Pratomo	L	90	100	100	100	100	94	T	
20	Alvin Pratomo	L	90	100	100	100	100	94	T	
21	Alvin Pratomo	L	90	100	100	100	100	94	T	
22	Alvin Pratomo	L	90	100	100	100	100	94	T	
	Rata-rata		90,0	97,0	97,0	97,0	97,0	94,0	95,2%	
	Standar Ketuntasan		$\geq 80$	80	80	80	80	80	80	95,2%

Keterangan : T = Tuntas, BT = Belum Tuntas

Data hasil belajar yang diperoleh dari siklus I menunjukkan nilai terendah 72 dan nilai tertinggi 98. Ketuntasan belajar mencapai 95,2% dan rata-rata kelas mencapai 87,2 dengan kategori sangat tinggi. Jika data tersebut dibuat dalam bentuk grafik, maka akan terlihat seperti berikut:



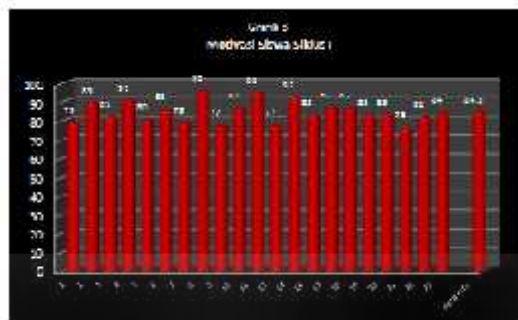
Data motivasi siswa yang diperoleh melalui pengisian angket dapat dilihat pada tabel berikut:

Tabel 3. Motivasi siswa Siklus I

No	Nama Siswa	Jml	%
1	Angga Pramudita	59	79
2	Anisa Nur Irani	67	89
3	Anita Kurniasari	61	81
4	Cahyani Patimah	68	91
5	Daffa Muhammad R	60	80
6	Dea Apriliani	64	85
7	Dede Supriatna	59	79
8	Deviani Nur Hasanah	72	96
9	Dewi Asih	58	77
10	Galih Arta Setia	65	87
11	Irene Puspita Dewi	71	95
12	Jeje Bagus Mulyana	58	77
14	Latifah Maharani	69	92
16	Mutiara Rosma Oktaviani	62	83
17	Neng Elinda	65	87
18	Putri Diana Sari	65	87
19	Rena Siti Nurfalah	62	83
20	Salsabila Yaafi Saniyyah	62	83
21	Shopiyani Kadila	57	76
22	Swietania	61	81
23	Windi Mulyawati	63	84
	<b>Rata-Rata</b>	<b>63.2</b>	<b>84.3</b>

Keterangan: Jumlah maksimum = 15 x 5

Motivasi tertinggi mencapai 96 dan terendah 76. Motivasi pada siklus I rata-ratanya mencapai 84,3 dengan kategori sangat tinggi. Jika data tersebut dibuat dalam bentuk grafik, maka akan terlihat seperti berikut:



#### 4.2 Hasil Penelitian Siklus II

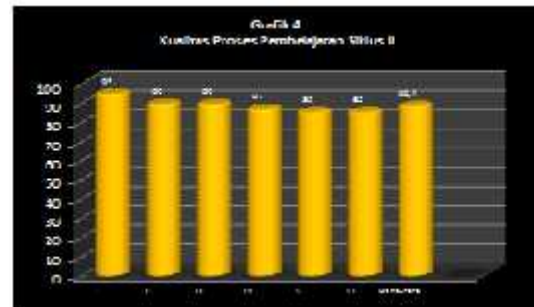
Data kualitas proses pembelajaran siklus II dapat dilihat pada tabel berikut:

Tabel 4. Kualitas Proses Pembelajaran Siklus II

No	Aspek	Kelompok						Presentase
		I	II	III	IV	V	VI	
1	Dasar-mendasar mengenai pembelajaran	14	13	15	12	11	17	81
2	Metode pembelajaran	15	13	13	14	14	13	91
3	Intelektual siswa dan guru	14	14	13	13	13	11	103
4	Eksplorasi siswa terhadap masalah pembelajaran	14	12	14	13	12	14	88
5	Sistematika pembelajaran	15	15	14	11	14	17	94
	<b>Rata-rata</b>	<b>14</b>	<b>13</b>	<b>13</b>	<b>13</b>	<b>13</b>	<b>13</b>	<b>88,4</b>

Nilai tertinggi untuk kualitas proses pembelajaran pada siklus II terjadi pada kelompok I dengan rata-rata 95 dan terendah terjadi pada kelompok V dan VI dengan rata-rata 85. Rata-rata kualitas proses pembelajaran siklus II mencapai 88,4, dengan kategori sangat tinggi.

Jika data tersebut dibuat dalam bentuk grafik, maka akan terlihat seperti berikut:



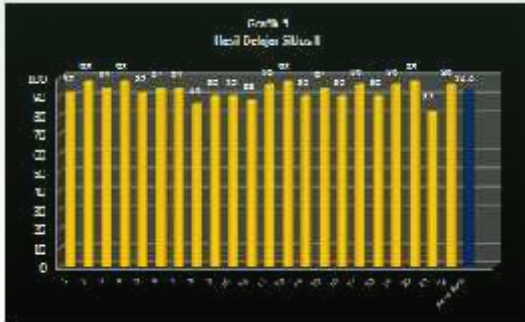
Data hasil belajar siklus II dapat dilihat pada tabel berikut:

Tabel 5. Hasil Belajar Siklus II

No	Nama	LSP	Nilai ulangan					Rata-rata	Tingkat
			1	2	3	4	5		
1	Adha Azzoni	L	90	90	100	100	90	90,0	T
2	Ahliq Nur Sa'adah	P	100	100	100	90	100	98,0	T
3	Arisa Fitri Hayati	L	90	100	100	100	90	97,0	T
4	Fitri Fitriani	T	100	100	100	90	100	98,0	T
5	Dhea Nurfitri	P	90	100	100	90	90	97,0	T
6	Dhea Nurfitri	T	100	100	100	90	90	97,0	T
7	Diaa Azzahra Fitriani Sitohang	L	90	100	100	90	90	94,0	T
8	Diaa Azzahra Fitriani Sitohang	T	90	90	90	90	70	84,0	T
9	Gisela Alia W	P	90	100	100	90	70	90,0	T
10	Gisela Alia W	T	90	90	100	90	90	90,0	T
11	Hana Wahsananda	L	90	100	100	90	90	94,0	T
12	Kanzila Putri Lestari	L	90	100	100	90	100	90,0	T
13	Lufita Ayu PS	L	90	100	100	100	100	98,0	T
14	Lia Dhalia	P	90	100	100	90	70	90,0	T
15	Makhsya Fauziah DL	P	90	100	100	90	90	94,0	T
16	Pahmanadi	P	90	100	100	90	70	90,0	T
17	Rizki Puspita Sari	P	100	90	100	90	100	90,0	T
18	Rosa Purwana	P	90	90	100	90	90	90,0	T
19	Rizki S. Wintaresa	L	90	100	100	90	100	94,0	T
20	Siti Anisa Azzahra	L	90	100	100	100	100	98,0	T
21	Dhea Nurfitri Nurfitri	L	90	90	100	90	90	90,0	T
22	Wahid Ibrahim	P	90	100	100	100	90	90,0	T
	<b>Rata-rata</b>		<b>91,3</b>	<b>97,2</b>	<b>99,5</b>	<b>90,2</b>	<b>85,0</b>	<b>92,8</b>	
	<b>Standar Deviasi</b>		<b>1,99</b>	<b>4,02</b>	<b>2,18</b>	<b>0,98</b>	<b>12,85</b>	<b>4,26</b>	

Data hasil belajar yang diperoleh dari siklus II menunjukkan nilai terendah 82 dan nilai tertinggi 98. Rata-rata nilai untuk siklus II mencapai 92,8 dengan kategori sangat tinggi. Ketuntasan belajar mencapai 100% dengan kategori sangat tinggi. Jika

data tersebut dibuat dalam bentuk grafik, maka akan terlihat seperti berikut:



Data motivasi siswa siklus II dapat dilihat pada tabel berikut:

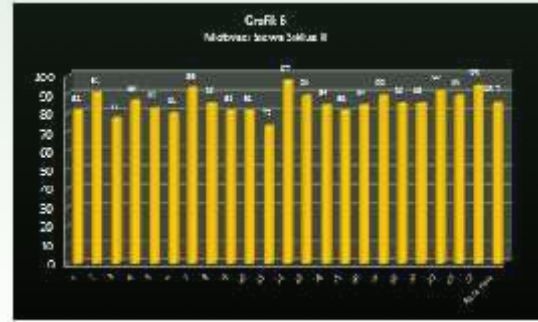
Tabel 6  
Motivasi siswa Siklus II

No	Nama Siswa	Jml	%
1	Ade Abidin	61	81
2	Alisa Nur Saadah	68	91
3	Aulia Gaul Septian	58	77
4	Cindi Fitiani	65	87
5	Dede Ramdani	62	83
6	Dhea Mulyasari	60	80
7	Diah Ayulestari	70	93
8	Firman Shambadda	64	85
9	Ghina Alya W	61	81
10	Gilang Ramadhan	61	81
11	Irma Nurhasanah	55	73
12	Kamila Putri Lestari	73	97
13	Lathifa Ayu PN	67	89
14	Lia Dahlia	63	84
15	Naditya Fathuriani Dh.	61	81
16	Pertamawati	63	84
17	Reisqi Puspita Sari	67	89
18	Reza Purnama	64	85
19	Rizka S. Wulandari	64	85
20	Siti Ainun Anwariyah	69	92
21	Suci Indah Novianty	67	89
22	Windi Indriani	71	95
	Rata-Rata	64.3	85.7

Keterangan: Jumlah maksimum = 15 x 5

Motivasi siswa tertinggi mencapai 97 dan terendah 73. Motivasi pada siklus II rata-ratanya

mencapai 85,7, dengan kategori sangat tinggi. Data dalam bentuk grafik adalah sbb:



## 5. PEMBAHASAN

Kualitas proses pembelajaran dari siklus I ke siklus II menunjukkan adanya kenaikan. Rata-rata kualitas proses pembelajaran siklus I mencapai 78,7 dengan kategori tinggi dan siklus II 88,4 dengan kategori sangat tinggi. Secara keseluruhan rata-rata siklus I dan siklus II adalah 83,6 berada pada kategori sangat tinggi.

Table 7. Proses Pembelajaran

No	Aspek	Siklus		Rata-rata
		I	II	
1	Tingkat pencapaian proses pembelajaran	76	84	80
2	Interaksi antar siswa	81	81	81
3	Interaksi antara siswa dengan guru	78	86	82
4	Terlaksananya siswa terhadap materi pembelajaran	79	88	83
5	Suasana pembelajaran	78	93	86
	Rata-rata	78.7	88.4	83.6

Kualitas proses pembelajaran dalam belajar akan mempunyai dampak terhadap hasil belajarnya. Rata-rata hasil belajar siklus I adalah 87,2 dengan kategori sangat tinggi dan pada siklus II adalah 92,8 kategori sangat tinggi. Hal ini terjadi mungkin karena pada pembelajaran dengan permainan kartu BILKAT, siswa dituntut untuk paham dan mengerti materi pelajaran, (bukan hanya sekedar hapal). Jika tidak mengerti siswa tidak akan bisa mengikuti permainan, dan dengan tidak mengikuti permainan artinya ia keluar dari kegiatan yang menantang. Demikian halnya pada ketuntasan belajar, kebanyakan siswa nilai tesnya memenuhi kriteria ketuntasan minimal (KKM) yang telah ditentukan. Ketuntasan belajar pada siklus I mencapai 95,2% dengan kategori sangat tinggi dan pada siklus II mencapai 100%, kategori sangat tinggi. Ada kenaikan sebesar 4,8%. Data tersebut dapat dilihat pada tabel berikut:

Table 8. Hasil Belajar

Siklus	I	II
NILAI TERENDAH	72	82
NILAI TERTINGGI	98	98

KETUNTASAN	95.2	100.0
RATA-RATA	87.2	92.8
STANDAR DEVIASI	7.00	4.26
KETUNTASAN	95,2	100

Kualitas proses pembelajaran dan hasil belajar yang memuaskan akan menumbuhkan motivasi siswa terhadap matematika. Motivasi siswa terhadap pembelajaran matematika menggambarkan bagaimana pandangan dan pendapat mereka terhadap matematika itu sendiri. Motivasi siswa pada siklus I mencapai 86% dengan kategori sangat tinggi dan siklus II mencapai 87%, kategori sangat tinggi pula. Pada siklus I motivasi siswa dengan kategori tinggi mencapai 24% dan sangat tinggi mencapai 76%. Sedangkan pada siklus II siswa dengan kategori tinggi mencapai 9% dan sangat tinggi mencapai 91%. Secara keseluruhan motivasi siswa dengan kategori tinggi mencapai 16,2% dan dengan kategori sangat tinggi mencapai 83,5%.

## 6. SIMPULAN

Berdasarkan data yang diperoleh dapat disimpulkan bahwa:

*Pertama:* Metode permainan kartu BILKAT dapat meningkatkan kualitas proses pembelajaran bilangan berpangkat dan bentuk akar. Kualitas proses pembelajaran pada siklus I mencapai 78,7%, dengan kategori tinggi, dan pada siklus II mencapai 88,4 % dengan kategori sangat tinggi.

*Kedua:* Metode permainan kartu BILKAT dapat meningkatkan hasil belajar bilangan berpangkat dan bentuk akar. Rata-rata nilai pada siklus I mencapai 87,2 dengan kategori sangat tinggi dan pada siklus II mencapai 92,8 kategori sangat tinggi. Ketuntasan belajar pada siklus I mencapai 95,2%, dan pada siklus II 100%.

*Ketiga:* Metode permainan kartu BILKAT dapat meningkatkan motivasi siswa pada pembelajaran bilangan berpangkat dan bentuk akar. Motivasi siswa pada siklus I mencapai 84,3 % dengan kategori sangat tinggi, sedangkan pada siklus II mencapai 85,7%, dengan kategori sangat tinggi juga.

## 7. SARAN

*Pertama:* Mengingat pelaksanaan penelitian ini baru berjalan 2 siklus, maka peneliti lain diharapkan dapat melanjutkannya untuk mendapatkan temuan yang lebih signifikan.

*Kedua:* Instrumen yang digunakan dalam penelitian ini masih merupakan instrumen yang validitasnya belum memuaskan. Peneliti berikutnya dapat mencoba dengan instrumen yang terstandar.

*Ketiga:* Walaupun secara keseluruhan kualitas proses pembelajaran dalam kategori tinggi. Tetapi perlu ditingkatkan bagaimana agar siswa mengeksplorasi materi lebih mendalam dan bagaimana meningkatkan rasa ingin memahami matematika yang lebih tinggi.

*Keempat:* Hasil belajar menunjukkan hal yang memuaskan, tetapi beberapa siswa masih mendapat kesulitan untuk menyelesaikan soal-soal tingkat aplikasi. Siswa harus banyak dilatih untuk menyelesaikan soal-soal (berpikir) tingkat sedang dan atau tingkat tinggi.

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## **Improvement of Collaborative Activities In Working Group with *Group in Group Learning Model* in Cartography Course of Geography Education Program Fis Unp**

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**Abstract:** .The purposes of this paper are: describing implementation of Group in Group method in cartography course in Geography Education Program FIS UNP; describing what kind of study material should be prepared by lecturer in the Group in Group learning model in cartography course in Geography Education Program FIS UNP; and also knowing the ability of the Group in Group learning model for improving student activities in collaborative group work on learning cartography in Geography Education Program FIS UNP. Subjects were studied in this Lesson Study activities are 64 first-semester students, who take independent regular class of cartography courses. The event was held for three cycles; three times of "plan, do and see" approach. Technique of data collection is observation, which data were collected using observation sheets, filled out by the observer during open class. Through qualitative analysis, data which have been collected, analyzed, classified and interpreted for seeing the trend of the data; then discussed and concluded. Based on the findings in this lesson study activities, it can be concluded: 1. Group in Group learning model is very effective to improve the collaborative work group class activities for bigger class of cartography course students. 2. In this learning model, it is need to prepare learning materials such as LKM and clear work instructions for each member of the group. 3. Percentage increase in the activity of student groups working collaboratively on cartography course increased from 60% to 95%, so 35% increase from the prior lesson study

**Keywords:** Collaborative activities, working group, *group in group learning model* , cartography

### **1 INTRODUCTION**

Law Number 20 in 2003 on National Education System, Article 1 paragraph 1 states that education is a conscious and deliberate effort to create an atmosphere of learning and the learning process so that learners are actively developing their potential to have spiritual strength of religious, self-control, personality, intelligence, noble character, and skills needed him, society, nation and state.

The successful development of the potential learner is determined by the implementation of the learning process, as it should implement an interactive learning process, inspiring, fun, challenging, motivating the students to actively participate and provide enough space for initiative, creativity, and independence in accordance with the talents, interest, and the physical and psychological development of students. For each implementation poses that, educators should learning preparation about lesson planning, implementation and assessment of learning processes to improve the efficiency and effectiveness of the achievement of the competence of graduates (Permendikbud No. 65, 2013)

In order to achieve competence in college graduates, lecturers have prepared the lecture by considering the characteristics of each course and subject characteristics of the students who attend college. Characteristics of subjects need to be considered for the formulation of the learning device in accordance with the respective rules of science.

Specific characteristics that are expected from the learner are development and improvement of attitude/behavior, cognitive development, and motor skills. Improvement and development building of attitude is the attitude among the learners and learner attitudes towards lecturers/educators. The attitudes expected in learning process such as emotional control, mutual respect, and cooperation within the group. If the characteristics of the courses and subjects that students are ignored then there is a possibility of the lectures that were made can not be used optimally.

One attempt to improve the quality of learning in order to improve the creativity of learners and educators through professional guidance for assessment is the application of Lesson Study on the principles of collegiality and mutual learning to build a learning community (Summer, 2002). Lesson Study

is a model of "teacher professional development". Through Lesson Study activities, developed learning can encourage students to learn actively, creative, effective, and fun through hands-on and mind-on activity, daily life, and local materials. In addition, the learning process can be developed collaborative activities learners, for example by the method of group work, learners can inform each other, respect each other opinion of friends/others, mutually explain/discuss, as well as competition between groups.

In lesson study activities in 2013, one of the Lesson Study courses is cartography. Cartography courses in Geography Education Program Study Faculty of Social Science State University of Padang usually be taught in two semesters, in first semester (Cartography weights 2 credits) and in second half (Practical Cartography weight 2 credits). However, starting in 2013 with compacting the curriculum changes and course load reduction credits for students, so that the two subjects are combined into one course that is only 3 credits cartography weight, but operationally practical activities include into this course.

During the implementation of this course on cartographic theory is more dominated by the lecture method varies, where professors use power point and slide projectors, and students in the lecture seemed happy to listen and record material that is explained by lecturer. In learning process, there are not a lot of students who want to asked while it has been given the opportunity to ask questions, but when asked the question as a feedback to the students, there are students who still can not answer the questions posed by the lecturer.

Implementation of cartography lab course in the next semester with more dominant practice, where lecture gives clues of lab work, and describes that part which is not understood by the students, then students work on practical tasks personally, because lecturer demanding individual student skills, and experience so far if the task practicum administered group, there is the tendency of some members of the group do not go to work, but only the passenger name, let alone the work completed outside of lecture hours for not enough time and queue usage workspace / workshop room.

When the presentation of the results of work carried out this task, it is clear that not all members of the group could master the concepts and the workings of the task, so author thinks that we have to change the way of learning that can enhance the collaborative activity within the student group work.

The method that the author made is forming small groups within a larger group which the author call the method "Group in Group". Author considers this method can increase the activity of a group of

students working collaboratively on cartography course.

## 2 METHOD

Please be advised that all the papers must be in English and without many errors. Please do not add any text to the headers and footers. Do not add page numbers.

1. Subjects were studied as data source.  
Subjects were studied in Lesson Study activities this is the first semester students, who take regular classes independently cartography courses, totaling 64 people.
2. Lesson Study Implementation Plan/  
This activity is carried out for three cycles, consisting of plan, do, and see in each cycle.
  - a. Plan  
The first plan was held on Friday 25th October 2013, this Plan was attended by all members of the team cartography courses, task force, Monevin, and chairman of the Department of Geography FIS UNP. The second plan dated 8 November 2013, and the Plan to 3 on November 29, 2013.
  - b. Stages of Implementation (Do)  
Implementation of learning / do the first conducted on Tuesday at 7:00 to 10:30 dated October 29, 2013 in Space Workshop Geography, the model lecturer is my own. Cartography team leader courses. Do the second time held on Tuesday November 12, 2013, and a third is planned on Tuesday dated December 3, 2013 at 7:00 to 9:30 in the morning.
  - c. Stages of Reflection (See)  
Stages of reflection carried out immediately after the open class, the implementation is a local workshop room that was used as a place open class. Reflection attended by all observers and lecturers models.
3. Techniques and data collection instruments  
Data collection techniques were performed was observed, and the data collected using observation sheets filled out by the observer based on the observation during the open class.
4. Data analysis techniques.  
The analysis technique was used is based on the qualitative analysis of the data which has been collected from the observer sheet. The data has been collected analyzed, classified and interpreted to see the trend of the data. Then discussed and concluded.

## 3 RESULT AND DISCUSION

### Plan

In stage plan / planning, team members joined in the Lesson Study design collaborate to discuss chapter and lesson design and student job sheet which have been prepared in advance. In this activity, discussed the problems that often become obstacles in learning cartography, namely the difficulty of building creativity

and teamwork for students, usually when students are given a task/work groups tend to this task is only done by some members of the group only, while the rest of the group just riding name only, in terms of the scoring task/work groups are the same, so it does not feel fair, and skills possessed all students are not optimal.

Then discussed methods and models are considered to improve the collaborative activity within the student group work. From the discussion the authors suggest that developing implemented by creating groups of 4-6 people, the size of the group members because the number of students in this class is quite large ie 64 people. Six people per group assessed the number of members is not effective to be able to increase the activity of all members of the group, because it needs to be turned down again, but when the number of group members be diminished, resulting the number of groups and workshop space in increasing and is not adequate for it. Then the authors suggested that the relatively large group consisting of 6 is further divided to 3 small groups so that each small group consisting of 2 students.

Each small group was given student job-sheet of the lecture material that is on the map scale changes and their impact on the presentation of data on the map. Each small group is also equipped with two sheets of topographic maps or maps Indonesian RBI scale 1: 50,000 and 1: 250,000. Then the students were told to understand the content of student job-sheet and work orders that have been written in the Student job-sheet. So finally revised with the lectures, and agreed methods and learning models that will be done at the open class / do.

The second plan was held on Friday November 1, 2013, the plan was discussed both the advantages and disadvantages of methods, models and student job-sheet in the previous plan and the fix for the next material diminution in the form of lab-scale maps and generalization processes that occur. The third plan is planned on Friday 29 November, 2013

1. **Do/open class**

- a. Activities do / open class was attended by 6 observers to observe and record the activities done by the students during the learning process. Once done do, the observer and lecturer reflection models (see), At this stage the observations discussed observer. Almost all observers have a positive impression on the implementation of the open class, although there are still some students were a little confusion in the early stages, but as faculty models responsive to students are not focused and do not understand the material and the task / work groups to be solved, then the models approach the lecturer concerned student.
- b. In the early stages of lecturers models explain facts and concepts map scale changes and the impact on the data and generalization of detail due to the change of the map scale, all students observed data on both maps of different scales based on the suggested reading material and student job-sheet already been distributed to each small groups, work to be done between the different groups of students in a small group in a large group and the task is part of a large group assignment. Then each group read the student job-sheet, observed data on both maps, discuss it with friends in a small group, noted.

Once the work is completed in small groups, discussed the findings of a small group in a large group, confirmed, and then be presented to the class.

- c. At this stage of class discussion almost all students excited and wanted to ask, respond, and give opinions about their findings in their respective groups. Do this first of a clearly visible improvement collaborative creativity of students in the task group.
- d. Do the second was held on Tuesday dated 12 November 2013 at 7:00 to 9:30 in Room Workshop Geography Education Program Faculty of Social Science State University of Padang. Observer in attendance amounted to 6 persons. In this second Do students practice the reduction process of map scale 1: 50,000 to 1: 100,000, meaning a double reduction.
- e. Implementation of learning also begins with an explanation of the task group is to be done on each student small groups and large groups. The entire small groups in large groups distributed student job-sheet that contains a brief lecture material and groups of tasks that must be done together. Small groups of 2 people, 1 person observing generalized maps and data, while another person or generalizations describe changes that occur, record and classify the type of generalization that occurs. Observed data is just data about the river (symbol line) and the data of settlement (symbol extents).
- f. After the small group's work was completed, a discussion and confirmation with other small groups in large groups. After the entire group work in the classroom was completed, a presentation, and the other listened, and added. So that eventually all the students in the class smile and feel happy with the day's lesson.

2. **See**

In the see / reflection stage is a very important stage for further efforts to improve the learning process will depend on the sharpness of the analysis of the participants based on observations of teaching practices that have been implemented. Reflection activities carried out in the form of discussion that followed throughout the lesson study participants were guided by the task force. The discussion starts from the delivery of the impressions of the observer and the observation of activity at the time students do.

Furthermore, all observers submit responses or suggestions are wise to the learning process has been implemented (not the teacher concerned). In conveying suggestions saranya, observers must be supported by evidence obtained from observations, not based on his opinion. Various discussions were developed in the discussion can be used as feedback for all participants for the benefit of the improvement or enhancement of learning processes. Therefore, all participants should also have records of discussions took place in the discussion.

## 4 CONCLUSION

Based on the findings and the discussion above, it can be concluded:

- a. Group learning model is very effective to improve the Group's collaborative group work activities cartography student learning for large classes.
- b. In the learning model of the Group in the Group needs to be prepared learning materials such as job sheet and clear work instructions for each member of the group
- c. The percentage increase in the activity of student groups working collaboratively on cartography courses increased from 60% to 100%, so increased 35% from the prior lesson study.

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## The Implementation of Lesson Study at Strategy in Mathematics Instruction Lecture

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**Abstract:** Strategy in Mathematics Instruction is an obligated lecture at Mathematics Department, Faculty of Mathematics and Science, Padang State University. This lecture was given to student as a candidate teacher. There are some problems happened during this lecture such as: student activity in questioning do not fluent, reading motivation and the capability of student in discussion still weak, sometime lecture preparing not optimal. Lesson study is an activity to improve lecture quality. Generally, it consist of three parts, those are: plan, do, and see. To implement lesson study at Strategy in Mathematics Instruction lecture is conducted several stages, those are: discuss with the colleague for preparing lesson plan, work sheet for student, all activity in open lesson, and reflection after open lesson. There are four times for open class activity. The method that used in each open class depend on the topic of discussion. The student are divided into small group with 3 to 4 student, doing student worksheet, reading the topic that can be discuss, and then presentation their result discussion in class. The result of the implementation lesson study can be improve the quality of this lecture such as: the increasing of student activity in questioning, reading motivation, the capability of student in discussion, and lecture preparing can be optimal.

**Keywords:** Lesson Study, Strategy in Mathematics Instruction Lecture

### 1. INTRODUCTION

The quality of teaching and learning process do not just indicate by increasing the result of study, but sometime also point that increasing the activity of student. The student have to have soft skill and hard skill to be success as a teacher. Their must be have a skill how to communicate nicely, and a higher motivation to read. Besides that the lecturer also have to prepare the lecture process, to be success achieve a goal of teaching and learning activity.

Strategy in Mathematics Instruction is an obligate lecture at Mathematics Department, Faculty of Mathematics and Science, Padang State University. This lecture was given to student as a candidate teacher. There are some problems happened during this lecture, such as: student activity in questioning do not fluent, reading motivation and the capability of student in discussion still weak, sometime lecture preparing do not optimal.

Lesson study is an activity that can be improve the lecture quality. Lesson study ( or kenkyu jugyo) is a teaching improvement process that has an origins in Japanese elementary education, where it is a widespread professional development practice. Working in a small group, teacher collaborate with one another, meeting to discuss learning goals, to plan an actual classroom lesson (called a research lesson), to observe how it works in practice, and then to revic and report on the results, so that other teachers can get benefit from it.

Cooperative learning is a model of teaching that can be conduct student to help each other. Student team learning is making cooperation in learning teams a routine part of a classroom organization, not an occasional fun activity. More importantly, carefully controlled studies have demonstrated that use of learning teams under specific conditions increases student achievement in mathematics and other subjects. Roger and David in told that do not all group discussion be a cooperative learning. To get a maximum outcome, there are five substance can be conduct in coperative learning: 1) positive dependence, 2) invidual responsibility, 3) face to face, 4) communication between member, and 5) group evaluation. The successfullly of group is depend on the effort of member. All member try to be good and do the best for their group.

Impementation lesson study at strategy in mathematics instruction lecture, the student divided into some group with 3 or 4 member in each group base on their cognitive ability. Each group try to find the information base on the topic that can be discuss in class. Assigment method is on of method that can be make student more active to get the information. This method was applied to ask student resposibility about their task. They have to find, read, discuss, and prepare their slide presentation about te topic. After student presentation, lecturer and student do the activity, discuss about the subject matter. At the end of this lecture student by guiding of the lecturer making a conclusion.

## 2. DISCUSSION

Lesson study is a teaching improvement and knowledge building process that has origins in Japanese. Lesson study was implemented at strategy in mathematics instruction lecture. In this paper, will be discuss about how was lesson study be implemented in this lecture. There are three steps activity in this lecture, they are plan, do, and see.

### a. Plan

In this section team lecturer in the same subject begin by selecting a topic and goals for student learning. They select a topic that interest to them. They are some topic selected from the syllabus: 1) opening and closing skill, 2) cooperative learning, 3) problem based learning, and 4) direct instruction.



Figure 1. Team lecturer discuss about plan

In plan section, the lecturer also discuss about a time and strategy that can be done in this lecture. After dicuss about plan, one of the lecturer be a model of lecturer in teaching. All material, such as worksheet, lesson plan, and observation sheet have to prepare before do section.

### b. Do

in this section lecturer model be implemented lesson study to conduct that lecture. There are some strategy used in this lecture. The student divided into a group with 3-4 member. Before starting a lecture the student asked to sit in group. During this lecture the student have to follow some activity, present the topic that will be discuss in class, asking and aswering question about their friend presentation, and making conclusion based on their discussion. The group that will be present choose randomly by a lecturer.

There are some observer can be observe all activity of student during the lecture. The observer can be used the observation sheet, to know about student activity. There are some question in that sheet: 1) when the student start concentrate to study? how was the prossess? 2) are there any student do not study or discuss? 3) why they don't study or discuss?

4) is the lecturer try to handle the student who don't study or discuss? 5) what are the advantages of this lecture that can you get today? 6) the blank space to give a chance for observer to write some comment from their observation.



Figure 2. Student activity during the lecture



Figure 3. The lecturer give a reflection for student activity, there are some observer in that classroom

There are some strategy that implement during the lecture is based on the topic will be discuss. 1) student asked to read the topic before start lecture, 2) present their result discussion using slide power point, sometime they can show by using the paper, and hang on the wall, so all student can see, 3) watching video about model of teaching problem based learning, then they are discuss a worksheet in group.

By using many variation strategy to conduct this lecture, the student can be more active, and enthusiasm follow all the avtivity. At the end of the lecture the student must be make a resume based on their discussion.

### c. See

It is an activity to discuss or give a reflection after do. In this section all observer can be discuss all thing that be happened during do. See or refleksi must be done as soon as possibble after do. Participant include the lesson study team members and guest observers. The moderator can start to be a guide discussion. In this discussion participant share the idea based on their observation. Based on the discussion the lecturer who take responsibility to open the class revise the plan to the next open class.

There are some information get from the observer: 1) some student do not consentrate at the beginning of lecture, but after fifteen minutes they

start to follow all activity in class, 2) some of them do not discuss in group although the lecturer try to remind them, 3) in general, the lecture be success based on plan, 4) variation strategy in teaching can make the student be more active and enjoy the class, 5) based on the discussion, team try to find another alternative, in next meeting for lecture,



Figure 4. Reflection between observer and team

Participants share their observations and examine additional evidence from the lesson, such as student written work, searching for pattern that may reveal important insight into teaching practice and student learning [5].

### 3. CONCLUSION

During implementation of lesson study at strategy in mathematics instruction lecture, some advantage that can be get:

- a. The experience of learning by student are increase:
  - 1) their activity in questioning,
  - 2) their motivation to read,
  - 3) their capability in communication,
  - 4) their responsibility in group discussion
  - 5) their responsibility in doing task
  - 6) their enthusiasm in lecture
- b. Based on the lecture:
  - 1) the plan for preparing lecture can be better
  - 2) the implement of lecture can be optimal
  - 3) the quality of lecture can be improve
  - 4) the lecturer can be handle the situation during learning process
- c. Suggestion:
  - 1) in activity at open lesson, more observer attend that class, can be more better,
  - 2) hopefully, lesson study can be implement for all subject,
  - 3) all observer must be give their report based on their observation
  - 4) this activity can be support with a good equipment.

### 4. ACKNOWLEDGEMENTS

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## Repersonalize by Teacher to Improve the Quality of Learning in Mathematics: Cuboid Volume in 5<sup>th</sup> Grade

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**Abstract:** How to develop students' understanding of the concepts about the volume of the cuboid? How to build students' understanding about concept of the volume of the cuboid? This is the basis of our thinking in designing a lesson about volume of the cuboid in the 5<sup>th</sup> grade. Through various learning experience, we expect the student will have more meaningful learning and can improve student comprehension. In this year we are carrying out a second cycle for the material taught in the previous year. In the first cycle (we conducted last year) we found a lot of unpredictable problems. The lesson that we have conducted did not appropriate focus learning objectives. This is a challenge for us to design better learning in the second cycle. In the second cycle we did a deeper repersonalize for designing learning activities. We did a lot of changing when we plan the second lesson. We designed a different learning sequence for the whole unit, not only for the open lesson. We also change the apperception that we give to the student, exploration activities, teacher's question and instruction. All of it is very important for us when design the 2<sup>nd</sup> cycle lesson. With this repersonalize, we can design 2<sup>nd</sup> cycle lesson more focused and directed.

**Keywords:** repersonalize, mathematics, cuboid volume.

### PREFACE

Meaningful learning is student-centered learning that means student involved actively on the process. Generally, it's been a long time that teaching-learning activity in Indonesia carried out by using conventional methods. This method cannot stimulate students' motivation. We are agree that it is not a mistake when teacher using a conventional method on an appropriate subject but this method is not appropriate for mathematics.

According to David Ausebel, meaningful learning is the lesson that can make student easily to understood because the teacher have capability to make it easily so students can connect their experience and their prior knowledge. Teachers have to develop student cognitive through meaningful learning. At the primary level, will be more beneficial if the students directly involved in learning activities.

Lesson study can be used as an alternative solutions to encourage the development of a learning methods. Lesson study is not a strategy or method in learning (Sudrajat, 2008). Lesson study was an effort to improve the learning process which conduct by a group of teacher in a collaborative and sustainable, not only in the planning process but also in observing and reporting a lessons.

According to that idea, we try to apply lesson study when we teach the concept of the cuboids' volume in a fifth grade. We designed the lesson through a series of activities in two cycle by using the principles of DDR (Design Didactical Research). In which the principle of DDR is puts forward thinking way at before, during and after learning. Teacher needs to do re-personalize by predict students' respond before the lesson, analyze the relationship between teacher, student and subject, and do reflection process about prediction

at before lesson and the fact that happened in the class.

By applying DDR, we are trying to map the problems occur in the first cycle that causes the purpose of learning in this first cycle is not achieved optimally. After doing reflections on the first cycle we formulate problem that happened:

- A-perception that we presenting are not helped students in the process of thinking when explore how to find the cuboids' volume.
- Instruction and duties which teachers gave not yet set the student at the purpose of learning to be achieved.
- Students' prior knowledge has not supported to achieve the purpose of learning.

Based on the problems, we make a new design learning activities for the same material, so that the aim of lesson can be achieved.

## LEARNING ACTIVITIES: CUBOIDS' VOLUME

In order to achieve the aim of meaningful learning in the subjects of mathematics at GagasCeria elementary school, has conducted two cycles of learning. Both learning cycles have the same objectives: how to find the volume formula through the exploration that involves students actively, so that students can find the formula of cuboids' volume by them selves. The second cycle is performed with the approach of the lesson study using the principle of DDR which consists of the stages of planning, implementation and reflection.

### 1<sup>st</sup> Cycle reflection result

In the first cycle, teachers with the team plan and learning activity together with regard to aspects of the manner of thinking at before, during and after learning. On the planning process, teachers are doing re-personalize. Teacher try to predict the student response before learning and analyze the relationship between teachers, students and subject content. On this stage, the first things that noticed is the purpose of learning. Starting with the process of analyzing competency standard and basic competence, the aim of leaning was formulated. The aim of learning was formulated based on graduates' competency standard. The aim of learning must be made carefully because it will determining what stage are conducted in a class in order to achieve this aim. Finally, has decided that the aim of learning is how to find cuboids' volume formula.

Reference to the purpose, teachers made a cuboids' volume lesson tree. Just like a tree, lesson tree is consist of: root which represent the matter that student have to know before learning about

cuboids' volume, stem which represent the stage of learning, and branch which represent the aim of learning to be achieved .

Teachers should do re-personalize herself being a student so teacher can predict student condition in the class. By noticed to a lot of aspect, learning media that used is cube unit and transparent cuboids which made from plastic. Transparent cuboids will fill by cube unit, it was made to help the student easily count the number of cube unit filled in the transparent cuboids and hope the student realize what the meaning of volume. Transparent cuboids made in three different sizes because student will compare the number of cube unit filled in.

All of possible things that will happen during the implementation discussed with the all anticipation including a-perception planning. Learning activity started by giving an illustration on the number of books that can fit in a place. In this activity children still enthusiast and studied attitude began to build. Then a-perception followed by showing two objects and students were asked to determine what objects that have larger volume. Teachers show many things to compare.

In the second activities, student in group conduct exploration to count cube unit filled in transparent cuboids. Each group has three transparent cuboids, cube units and worksheet that must be done by student. Each group consist of four persons, teacher have arranged the group consist of different student capability. From this activity the teacher predict some of group who will find the sum of unit cube by multiplying of the number of length, width and height of cubes so student can get the formula. But in fact many student cannot make a conclusion that formula to find cuboids volume is from multiplying length, width and height. So, at the end the conclusion the formula given by a teacher not come from the students. Why it happened?

After the reflection with a team that makes planning, we concluded a few things that causes the aim of learning cannot be achieved. Comparing many objects at a-perception turns out students attention and not connecting prior knowledge and the concept would be taught. Beside that learning activities also not build students understanding to find the formula cuboids volume. Comparing the three transparent cuboids not guide the students to find cuboids volume, because student that only riveted on counting the number of cube units without think how to count the volume.

### 2<sup>nd</sup> Cycle Planning

Based on the results of the reflection in the first cycle, we try to create a better learning plan. We

did analysis of what it should be owned by the students so that they are ready to find the formula cuboid volume. When the team make the learning plan we got some suggestion from some experts. Prof.Didi Suryadi says students must understand the concept of multiplication of three numbers, because they are worried students are still difficulties in multiplication. Before getting into the volume must consider first experience multiplication ability of three numbers. When we teach a multiplication we always remind the definition of that multiplication is repeated addition.

The learning activities in this second cycle is more organized. When we are planning not only to plan for the learning material that will be presented to the child on that day only but we have to plan lessons for the whole unit so that the learning will be conducted continuously. In the context of studying the volume of the cuboid the subject of area becomes an important thing that should be reinforced to the students because it will help students in understanding the concept of this cuboid volume.

We had a lot of discussion to plan this second cycle. Many things to think about, because in our opinion not only the learning activities that affect student learning but the instructions and learning media must also support learning. In designing this study in the second cycle we were assisted by some experts as Prof. DR. Didi Suryadi M.Ed, DR. Endang Mulyana, and Tatang Suratno M.Sc. We also received suggestion from Mr. Muchlis as mathematics lecturer from ITB.

### Implementation

The learning activities are provided to the students are:

### Apperception

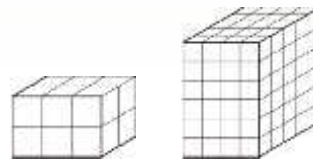
Teachers provide apperception by a game of numbers. Students will be required to take the card that has been provided by the teacher. The card will contain a number that is 12. The teacher provides 4 cards that contains the same number. Teachers will provide instruction: Type 3 integers that if the three numbers are multiplied produce number 12. We choose three numbers as apperception due to connect multiple length x width x height as a destination to learn how to calculate the volume of the cuboid. We have a reason why we choose number 12. Because it has multiple answers when the child must determine the multiplication of three integers that can produce alternative answers 12. The teacher can ask the answers to some of the students randomly.

### Core Activity

Students are divided into several groups. Each group will get a transparent mica blocks and 60 unit cubes. The teacher asks the students to think of three ways to obtain the number of unit cubes that can fill in the cuboid. Students will write the answers on a piece of paper. In this activity students are expected to answer the  $3 \times 4 \times 5 = 60$ .



To find out more the student has been able to figure out how to find the volume of the cuboid, the teacher will provide two pieces of cuboid image with different sizes.



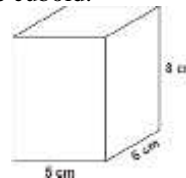
Then the students should calculate the volume of this cuboid (the size shown in the figure). If students are able to calculate the volume by given cuboid image, next the teacher will provide the cuboid without size information and ask students about the elements of the cuboid (length, width, and height).



Based on the results of the activity, students are directed to find that the formula the cuboid volume is the length x width x height.

### Closing

For the validation of students' understanding in calculating the volume of the cuboid then the teacher gives the cuboid image with description of the size and students could calculate the volume of the cuboid.



### Reflection Activity

There are many changes in the learning activities to calculate the volume of the cuboid when we compare with last year learning activities. Difficulties experienced by the students in the first cycle can be solved through the activities carried out in this second cycle. Learning activities in

cycle 2 is more focused on how the students calculate the volume of the cuboid. Activity apperception of multiplication of numbers can facilitate students in calculating the volume of the cuboid. The student was able to work systematically. It can be seen from how the students in counting the number of unit cubes using the multiplication of the area of the base x height or using multiplication sides. Question direction or instruction teachers can build more structured systematic thinking in the child's head, so that children are stimulated to associate learning experience possessed by the new experience gained achieve the learning objectives.

## CONCLUSION

Learning activity at primary school will take properly if through stages of thinking accordingly. The process of learning from concrete-pictorial and abstract packaged in contextual learning is a series of activities or processes that need to be passed by a child learning to understand a particular concept in math lessons. This understanding is evidenced also in this open lesson. Children are expected to do their own exploration in finding various ways to calculate the volume of a cuboid by using unit cube. Students are then asked to find the easiest way to calculate the number of unit cubes. Students will learn that by counting the number of unit cubes as well as calculating the volume of the cuboid.

These direct experiences will connect students to compose the meaning of the concept of cuboid volume. Through this activity students will be able to remember the concept of the volume of the cuboid and can apply it in various contexts. It is not only about the memorizing formulas.

In the implementation of learning is not going exactly as planned. There will always be new things that appear which is not predictable before. The ability of teachers to understand students' difficulties when learning is very necessary so the learning does not become stalled in a difficult situation. Teacher's ability to improvise so that learning objectives can still be achieved, because the important thing is not to implement according to plan but learning how to create a learning bring the students reach the expected goals. The ability of teachers do repersonalize activities that have been carried out on various aspects such of attitudes, skills, and cognitive students is a teacher's success in implementing a learning activity. And it will be a material improvement for future learning.

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## Understanding Students' Obstacles In Reading Comprehension EFL Lesson Study at GagCeria Primary School, Bandung, Indonesia

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**Abstract:** The aim of this research is to determine the level of English children's reading comprehension. This article is based on a report that the learning process is carried out by three English teachers to students through reading exercises, analysis of the child's responses and provide a way to answer the questions based on the text. Students are able to understand the text, although they sometimes face difficulties. Mostly they did not understand the vocabulary. First until third grader need a visualization (property, picture and body gesture) to understand the text. Fourth until sixth grader understand the text from discussion with a stimulus questions about the text (using WH Questions).

**Keywords:** Reading Comprehension, Lesson Study, Reflective Practice

### 1. INTRODUCTION

Reading is very important in the educational process. Through reading, we will find out students development widely. Reading is also a tool to measure our ability of reading, both Indonesian and foreign languages. Reading can measure student ability in understanding subjects. Besides that reading is also a part of education as a tool that can be used in education competition both domestically and abroad. In this era of globalization, learning and mastering English is considered important and a necessity. English is the implication of subjects studied at each level of education. In fact, teaching English in primary schools is more difficult than the first or middle school. It is because the primary students do not know English before. Learning to read, understanding the meaning of the writing is very important for children education and personal development, which can be implemented with appropriate lesson (Cameron, 2001).

In fact, learning English is often considered difficult by students. They feel burdened because they have to understand new vocabularies. The thing which is the most difficult for elementary school students is to understand a text in English. There are a lot of factors which can make the students feel difficult. The understanding will be different when they read text in bahasa and in english.

The factors that make students feel difficult are because they do not understand the contents of the reading and they do not understand what is being asked in the question related to the text. If this condition is ignored, probably students would not like English because of the complexities of vocabulary that requires students to understand

reading, reading skills so that learning goals are not achieved.

### 2. LITERARY REVIEW

#### 2.1 Reading Definition

Reading is a complex and complicated process. The complex means that in the reading process involved a variety of internal factors and external factors from the reader. Internal factors such as intelligence, interest, attitude, aptitude, motivation, purpose of reading, and etc. External factors such as means of reading, social and economic backgrounds, reading habits. Complicated means external and internal factors interact to form a complex coordination to support reading comprehension (Nurhadi, 2008: 13).

Klein et.al. (Farida Rahim, 2005: 3) the definition of reading include :

- 1) Reading is a process  
Reading is a process intended information from the text and the knowledge possessed by the reader has a major role to form a meaning.
- 2) Reading is a strategy  
Pembaca yang efektif menggunakan berbagai strategi membaca yang sesuai dengan teks dan konteks dalam rangka mengkonstruksi makna ketika membaca.  
Effective readers use different appropriate reading strategies to text and context in order to construct meaning.
- 3) Reading is an interactive  
People who love to read, will meet some of the objectives to be achieved, readable text that



should be easily understood sehingga no interaction between reader and text.

## 2.2 Reading Interest

Reading habits related to the habit. Interest is an acceptance of mind that are active to to receive something from outside. Interests can be divided into two types, firstly spontaneous interest and interest pattern. Spontaneous interest is an interest that grew spontaneously from inside without being influenced by outsiders. Patterned interest is an interest that arises as a result of the influence and activities of the plan or pattern, especially teaching and learning activities, both at school and outside of school. Dawson & Bamman in Sutini (2010).

Reading interest appear from a long process and phase changes that appear regularly and continuously. As described previously, interest is a likely feeling and interested feeling to activity that shown by desire to notice the activity spontaneously without being influenced by outsiders, with glad feeling.

## 2.3 Interest Factor in Reading

According Anna Yulia (Kholianti, 2011: 33-34), challenges or obstacles in growing interest in reading is :

- 1) Reading culture  
According research from ASEAN Libraries (Anna Yulia Blogs,2011), develop country citizen mostly has a low reading culture. For example, citizens will choose to talk with someone when they waiting in the public area.
- 2) Television  
The influence of television is huge for adult and childre. Most of them spending their time in front of television. Although they watch a good program, still they spending too much time in front of television. They should be allocated to the things that are useful, which is reading a book.
- 3) Book is not priority  
Generally, in develop country, the citizen still struggling with economic factor so that they only had a focus on to daily need. Citizen generally do not pay attention to education and book.
- 4) Lack of Facilities  
Environmental conditions or the community is really affect reading culture. In developing countries that the problem is still struggling around economic and political problems as in Indonesia. Education often ignored by the government so that citizen frequently visit library.
- 5) Family

Accordingly Rubin (Farida Rahim, 2008: 18), warm, democratic, can direct their children to activities with education oriented because it will chalange them to think, encourage children to be independent and get ready to study at school. Parents who like to read, have books collection, appreciate reading and like to read story to their children generally deliver children who like reading.

## 2.4 Reading Interest Data In Indonesia

Data from Badan Pusat Statistitik (BPS) in 2012 show that 91,68% Indonesian citizen from age 10 and above like watching TV and only 17,66% who like reading newspaper, book or magazines.

Data in 2011 from United Nations Educational, Scientific and Cultural Organization (UNESCO) lack interst of reading in Indonesia, showed by reading index 0,001 (from one thousand citizens, there is only one person who still has a high interest in reading).

Data in 2012, Indonesia got rank 124 from 187 countries around the world in Human Development Index, especially about basic needs, including education need, public health, and recognition of reading. Indonesia has 165,7 million citizens, only had 50 million books came out to public each year. It means that, average only a book read by 5 people.

## 2.5 Reading Strategies and Techniques

- 1) Scanning :  
Scanning is really about deciding if a resource is going to be useful or not.
  - a. Use the contents page and subheadings to get a general idea of its suitability.
  - b. Look out for bold, italic or different font prints
  - c. Scan for specific words or key phrases
  - d. Use your finger to guide you down the page and maintain focus
- 2) Skimming  
One you have scanned a resource and decided that it is suitable for your purpose, you may then want skim read for further information. This is used for getting the ‘gist’ of a text without painstakingly reading word for word with an internal monologue. The act of reading changes so that you read 3 – 4 words at a time. A useful way to think about this is to consider individual letters in a word – you don’t *read* each letter but *see* the whole word. The same applies to skim reading – you don’t *read* each word but *see* clusters of information.
  - a. Use organisational features of the texts (i.e. start/end of paragraphs; conclusions, etc).

- b. Read further away from the text than what you would normally do (creating a larger space between your eyes and the written word).
  - c. Don't let your eyes move from left to right as this encourages word for word reading. Instead, try to keep your eyes still with a loose focus down the middle of the text.
  - d. Practice, you will only develop these skills if you practice them. It may be easier to start off with light reading at first.
- 3) Detailed Reading
- Scanning allows you to locate information quickly. Skimming allows you to digest the main ideas of a text quickly. Sometimes, you will need to spend more time on a particular extract. Detailed reading sets aside more time for you to focus on the essence of what you are looking for.
- a. Make it interactive using highlighting or note-taking to record important aspects.
  - b. Do it in combination with scanning and skimming so that you can allocate your time efficiently and effectively.
- ([www.ababasoft.com](http://www.ababasoft.com))

**2.6 Lesson Study**

Lesson Study has been implemented by the Japanese education system since 1900's. However, Stigler and Hiebert described Lesson Study extensively in 1999 in their book “The Teaching Gap” (Hock & Sam, 2010). Lesson Study is an approach used to conduct the research on teaching in the classroom. This approach is able to explore the development of more meaningful teaching because it emphasizes the teaching process. The exploration of the teaching process is in the form of inquiry investigation (Chassels & Melville, 2009) and systematically through the observation of teaching (Fernandez, 2002).

Lesson Study is a continuation of collaborative teaching methods and has its own characteristics (Daipi, 2009). Lesson Study can enhance teachers' learning experience as well as improve their teaching. Teacher learning experiences include teachers' knowledge of the content of the lesson (content knowledge) and knowledge of teaching methods (pedagogical knowledge), which should be built and derived from observation and reflection activities of teaching practices (Dotger et al., 2012; Lewis, 2008; Post & Varoz, 2008). It also does not marginalize the importance of students' learning in the teaching process. The evaluation and reflection of each lesson is not only on teachers but also focuses on the development of student learning. Teachers observe learning ability and intelligence of students (Cheng & Yee, 2012; Lewis, 2008).

This helps teachers plan lessons carefully and meet the students' needs. In addition, the Lesson Study approach enhance creativity and critical thinking of trainee teachers (Ong et al., 2010), particularly when analyzing in-depth lessons, stimulating innovation, and reforming teaching and learning to find solutions to a problem and to expand understanding skills as well as the ability of teachers and students. Lesson Study can be implemented in various ways to suit the teachers, students, and the environment while meeting the criteria in Lesson Study cycle, as shown in Figure 1.

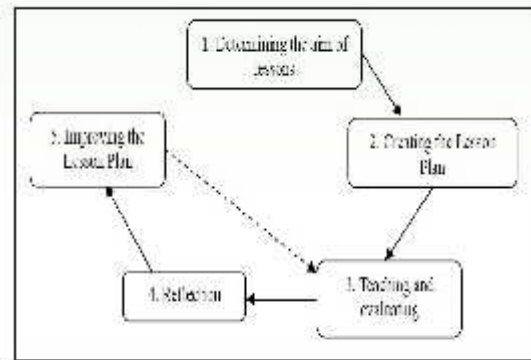


Figure 1. Lesson Study Cycle

Lesson Study implementation involves several teachers teaching sessions. Uniquely, the teachers work together to determine the objective of each teaching session. The first step in the Lesson Study involves teachers' discussion to determine appropriate learning objectives with targeted students. The teaching objective should be reasonable as students need to understand the concept and teach effectively. In the second step, teachers are asked to build a complete Lesson Plan for teaching together (Lewis, 2008; Post & Varoz, 2008; Teacher Education Division of the Ministry of Education, 2011) based on long-term judgments about student learning. Lesson Plan contains detailed information about different aspects of each lesson to be carried out (Fernandez, 2002).

Cooperation in the preparation of this Lesson Plan is expected to generate more thoughtful ideas. In the third step, a teacher will implement teaching in a simulation classroom based on the proposed Lesson Plan. Another teacher will monitor and evaluate the teaching (Lewis, 2008; Post & Varoz, 2008). Both are expected to understand the subject matter taught, as they will develop a Lesson Plan.

Therefore, the observation of the students responses is based on observations protocol then the results is recorded (Fernandez & Robinson, 2006). Deep observations will provide detailed feedback to stimulate the teacher to understand their students' learning better (Cheng & Yee, 2012). After completing the lesson, the teacher will reflect on the

teaching and learning and discuss the strengths and weaknesses of teaching during the process of teaching (Teacher Education Division of the Ministry of Education, 2011).

As such, the Lesson Plan can be improved based on the reflections, which can be used to identify weaknesses in the operation of learning (Marble, 2007). Next, the second lesson can follow the improved Lesson Plans. Indeed, during the second lesson, the teacher can try to modify the thoughts of students who previously adopted the wrong concept of learning (Cheng & Yee, 2012).

### 2.7 Reflective Practice

The most critical step in professional education is when students are able to transfer theory learned in the classroom into practice. Unfortunately, many students are unable to transfer and apply this knowledge successfully. Reflective practice forms the basis of deep learning from past experiences. It helps develop critical thinking, problem-solving, and self-directed and lifelong learning skills through gaining new understandings, new perspectives, and new alternatives for future experiences.

Using these phases to define how teachers think about their teaching, Loughran (1995) developed a framework to help make the invisible day to day reflective practices of teachers visible. The framework consists of “reflecting during the act of planning the lesson (anticipatory reflection), and during the actual teaching of the lesson (contemporaneous reflection), as well as after the lesson (retrospective reflection)” (Freese, 1999, p. 2).

Through this process, teacher educators can employ instructional strategies to train pre-service teachers to use reflection for asking the harder, deeper and more probing questions regarding practices and to analyze the effects on our classrooms and students. This level of reflection has been described as a complex and multidimensional search for understanding, drawing from the past and the present, with implications for the future (Smith, 2001).

Despite the development of a framework, a clear definition of reflective practice remains elusive (Ross, 2002). Freese (1999), a researcher working in the field of pre-service teacher education, supports making reflective practice more explicit by calling for a shared definition through modeling and conversation about reflection. She conceptualizes reflection for her students as: “The process of making sense of one’s experiences by deliberately and actively examining one’s thoughts and actions to arrive at new ways of understanding oneself as a teacher”. Duncan-Andrade (2005) describes the need for pre-service teachers to critically examine their actions in terms of the b of **emancipatory pedagogy**:

**engage, experience, empower and enact.** These critical learning activities ultimately encourage students to examine and act out their sense of agency, imagining the best possible teaching--what could happen, rather than what did happen (Davis, 1996; Smith, 2001).

### 3. RESULT

Reading comprehension is one of language competencies required in EFL lesson. However, there are constraining factors impeding primary students to comprehend English texts at hand. Most notably are their limited vocabularies, as well as their reading interests and skills. Such situation gives rise to our awareness of the importance of understanding students’ learning as the subject of teachers’ learning. Therefore, this presentation has two focuses. Firstly the authors discuss the way we, as EFL teacher group, grasp students’ obstacles by means of conducting a set of pre-test relating to reading comprehension. In doing so, we do pre-test to know at which level their reading comprehension ability was.

After reading text, students should answer the questions. The results provided initial evidence for grounding our lesson study practice. Accordingly, we then worked out reading techniques, for example we provide reading techniques, search the correct answer and advise the children to borrow English books from the library to increase their vocabulary.

To enhance our sense making of children’s progression, we conducted classroom observation of the designed lesson followed by post lesson discussion. In fact, it is not always the case that such attempts would achieve the expected improvement. Secondly, we share our lessons learned from our Lesson Study practice. As our group consists of teachers from different grades, Lesson Study provides platform for teachers’ collaboration and mutual learning. Hence, factors that might promote or inhibit teachers’ reflective practice will be discussed. Indeed, there is reciprocity between teaching and reflective practice from which we mirror our practice of improvement as to maintain that teaching is the learning profession.

**Table 1. Reading Comprehension Percentage**

Test	%				
	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	6 <sup>th</sup>
1	75,5	77,9	<b>85,9</b>	81,0	75,4
2	81,2	84,7	96,1	81,5	75,0
3	83,1	88,	44,7	69,5	86,5
4	79,0	79,3	91,3	65,2	84,5
5	69,4	91,8	81,3	75,3	83,2
6	88,6	68,5	87	72,0	71,0
7	81,6	87,3	89,7	95,2	83,2
8	77,9	84,8	72,6	82,5	85,1
<b>Average</b>	<b>79,5</b>	<b>84,8</b>	<b>72,6</b>	<b>77,8</b>	<b>85,1</b>

The research was conducted on second to sixth grade. First grade was not recommended because their vocabularies was still very limited and reading comprehension still focused in the mother tongue ( Indonesian language ).

Table 1 showed that the percentage of reading comprehension still fluctuates. The results of research showed that second to fourth grade preferred to do the multiple choice. They did not really like an essay because they had difficulties related to their vocabulary they have. Beside that, fourth grade seen more easily doing the instruction text in multiple choice. In explaining an essays, they had difficulties in answering on the question “*why*” and “*how*” and “*what do you think*”, or getting the meaning of text or the stories they read. In addition , they preferred to answer a text related to theme they learned and they had difficulties in answering a text outside of the themes. When we evaluated, students had difficulties because there were different vocabularies they read and learned. After seeing the score of students of second to fourth grade, in certain days, teacher asked them to borrow English book from library to increase their vocabularies.

One of the most interesting time for second and third grade was story-telling. Story telling is a creative process in telling story so that children convey that those things were truly heaven. We used puppets, animal figure and pictures. The aim of using media activities (puppet or animal figure) is to help children understand the content of story in English by changing abstract to concrete. Primary school students are in the period of intellectual and stages of concrete operations

Fifth and sixth grade preferred a multiple choice to an essay. If we did discussion process in reading text, they would understand it more. For example, they read paragraph by paragraph, in every paragraph teacher asked some stimulus questions and they answered them. So that students will be more understand the contents of the text. Besides, due to the process of discussion students become more open or eager to ask about some vocabularies that they did not understand so they had meaningful discussion.

Some factors that affect the children’s interesting of reading are:

- 1) Teacher  
Every teacher has a their own style of teaching. It can reflected in the time when they are teaching. influenced by his own styles of teaching, concepts of psychology they used, and the curriculum implemented
- 2) Student  
Every student have different kind of skills and personality. Student’s skills are potential to be developed or they can grow it while they study.
- 3) Environment

The environment can be positive if it can give impetus and stimulus for children to do good things.

- 4) Appreciation  
The appreciation for students is one of many efforts can teachers give, with the hope of interest and enthusiastic students in learning especially understand reading always preserved.

After doing evaluation we can know the competence of students and as teacher, we can evaluate our teaching styles. They are good for teachers and students.

#### 4. CONCLUSIONS

- 1) Students can get the meaning of the text reading, although there are several difficulties related to the understanding of the vocabulary , interest in reading, ability in understanding and the attitude of reading. Second and third grade needed pictures, body gestures to understand them.
- 2) Fourth to sixth grade had a better understanding to the contents of reading through the process of discussions with a stimulus questions about the contents of reading every paragraph using “WH” questions. But, they still have difficulties in answering questions by writing.
- 3) Type of text reading also affect the achievement or competence of students. If the reading text in accordance with the theme of which are being studied, children would have the interest in reading .
- 4) If they see or read a text outside the theme, they have anxiety, perception that it would be hard .
- 5) Teachers needed to be someone who capable to propell and motivate students so that they would have high reading motivations.
- 6) Teacher could give guidelines through questions that could give make the willingness of students to improve their competence. Teachers could responds positively to reading activities that children do. We could provide the opportunity to convey the outcomes of their reading comprehension.

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## Lesson Study-Based *Terjun Tulis Saji* (TTS) For Improving Scientific Literacy of Class X Students

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**Abstract:** Equality advances in science and the development of nations in the world becomes a challenge to face the 21<sup>st</sup> Century. One of the components of life skills that are important in life is a 21<sup>st</sup> century scientific literacy. Scientific literacy is the ability to combine science and technique to advance the social and cultural life, as well as putting science and technology in modern life. Scientific literacy of students can be improved by developing new learning methods. This study will introduce a new learning method called *Terjun Tulis Saji* (TTS). TTS is a modification of the Think Talk Write (TTW) that was initiated by Huinker and Laughlin in 1996. TTW needs to be modified so that students can make the science processes more meaningful. TTS invites students to make observations, write, and present the results of his writings. At the stage of *Terjun* (observe) the students make observations (see, read, and hear), and was led to make inquiries so that it falls more focused activities. *Tulis* (write) is the activity in which students will be looking for answers to their questions by way of associating the information from various sources, and write an article in the form of a newspaper article. During *Saji* (present), students present the results of writings by utilizing social media *facebook* as a medium of learning. This study is a Lesson Study (LS)-based action research that were performed in Class X-MIA3 students of SMAK Kolese Santo Yusup Malang-Indonesia for 4 open lessons. The action involving the LS team consists of 7 people. This study provides valuable input for improving the professionalism of teachers and students' learning process. Inputs from the LS team include improving learning lesson plan, instructional media, reference sources (web address or an online journal for students), teachers accommodate students' learning techniques, the use of social media *facebook* and improvement of assessment rubric for scientific literacy. Results showed improvement of the learning process (preparation of lesson plans, ways in helping students learn, assessment procedures) and biology learning outcomes by increasing the scientific literacy of students.

**Keywords:** action research, lesson study, scientific literacy, *Terjun Tulis Saji* (TTS)

### 1 INTRODUCTION

Life skills to be one important aspect of the curriculum that was developed in 2013. *Lembaga Penjaminan Mutu Pendidikan (LPM)* states that the ATCS (Assessment and Teaching for 21<sup>st</sup> Century Skills) concluded four major issues related to 21<sup>st</sup> century skills which are a way of thinking, working, working tools, and life proficiency. This way of thinking include creativity, critical thinking, problem solving, decision making, and learning. The workings include communication and collaboration. Tools for working include information and communication technology (ICT) and information literacy (Trisdiono, 2013). The same aspects of the paradigm of national education as written on the 21<sup>st</sup> Century Partnership Learning Framework, that the

competence and/or skills to be possessed by the human resources of the 21<sup>st</sup> Century: the ability of critical thinking and problem solving, the ability to communicate and work together, the ability to communicate and collaboration, the ability to create and update, information and communication technology literacy, contextual learning ability, and media literacy information.

Information literacy an important part in the education of the 21<sup>st</sup> Century in line with the rapid development of science and technology, because of the nature and practice of science affect the social, economic, and political (Hurd, 1998). Further it was explained that scientific literacy can combine science and technique to advance the social and cultural life, as well as capable of putting science and technology in modern life. The implication is that scientific

literacy would urge people to be socially responsible and competent as citizens. Scientific literacy is seen as a social competence necessary for rational thinking about science in relation to political, economic, social, issues that arise in life. Characteristics of scientific literacy needs to be taught where the students more involved in learning to solve problems, conduct investigations, or develop a specific project. Laboratory activities and supported the activities went to the field to find the data will bring more students understand the concepts of science and its application in society (Hurd, 1998).

Scientific literacy of students needs to be improved to accommodate students' learning strategies. The lesson activities are designed with the modification of learning strategies that have been used in the classroom. Learning strategies that can be modified is Think Talk Write (TTW). TTW is one of the learning strategies implemented in order to achieve the learning objectives with precise through the process of thinking, speaking and writing. This learning model is introduced in the article entitled Talk Your Way Into Writing, written by Huinker and Laughlin in 1996. The process of learning in the model consists of three steps, namely Think, Talk, and Write (Huinker, 1996). Learning TTW can be one of the learning activities that can develop scientific literacy skills which can be seen from the indicators that apply understanding of concepts and to consider solutions in problem solving. Think and write down the results of his thinking then discuss those in class is one important aspect of scientific literacy, where students will be trained to evaluate ideas based on evidence and to apply conclusions from such thinking (Shwartz, 2006). To improve scientific literacy, then TTW should be modified so that more students be able to explore their ideas from a variety of sources.

Modification is done by introducing learning strategies TTS (*Terjun Tulis Saji*). TTS is a learning model of learning in which students conduct *Terjun* or observe (see, read and hear), so in this activity students will think (Think) as in TTW, but students are also expected to find the problem and ask questions related to issues there and do a search for information. Resources can be searched by students through direct interviews, experiments, reading textbooks, or search the internet. *Tulis* is an activity in which students will seek answers to their questions in a way associate the information from various sources. At this writing activity, students will write an article in the form of newspaper articles. Newspaper articles is selected so that students can pour their association results into a written form. During this activity students can conduct discussions with peers and teachers. *Tulis* activities is similar to activities of Write in TTW. The last activity of the student is *Saji*, where students present the results of

his writings to be read and commented on by friends and teachers. This presentation is done by utilizing social media *facebook* as a medium of learning. *Facebook* will allow students to be able to access the writings anytime and anywhere, as well as other students' and teachers' comments can also be read.

The effectiveness of the application of the TTS as one of the TTW modification needs to be studied using LS as a means of control. So it can be monitored successful learning strategies, student activities while learning, it can also provide feedback to the teacher related to the learning processes.

## 2 PARTICIPANTS

This research was conducted in class X MIA 3 SMAK Kolese Santo Yusup Malang-Indonesia, amounting to 44 students with a Biology lesson 2. LS team consists of 7 people, where there is one Professor as a lecturer, two new junior teachers who has been teaching for 3 years, 1 model teacher and 3 master students in the Department of Biology Education UM. All team members have been introduced in the LS theory about this and have known TTS and know TTW well.

## 3 RESEARCH PROCEDURE

This study is an action research-based LS conducted on the students of Class X MIA 3 SMAK Kolese Santo Yusup Malang-Indonesia for 4 open class the action involving the LS team consists of 7 people. The following cycles were performed LS (Smith, 2010).

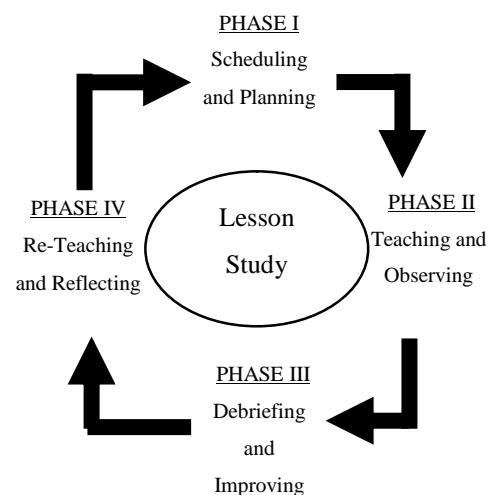


Figure 1. The Cycle of Lesson Study (Smith, 2010)

During TTS students do learning activities in which students will observe (do lab work, reading text books, interviews, reading the online literature), write, and present the results of the writing on the

*facebook* group. Students are grouped into discussion groups, and the teacher gives feedback on the discussion and the results of papers have been uploaded in the *facebook* group.

All activities are carried out by a team of students discussed the LS, and then modeled by teachers and observed by the other team members which further reflected the results of his study to see how far the TTS can be used to improve the scientific literacy of students.

#### 4 DATA AND DATA ANALYSIS

The data used is the improvement of the learning process (preparation of lesson plans and how to teach) and learning outcomes include increased scientific literacy (the assessment process). LS team input for improvement include improving learning a lesson, instructional media, reference sources (web address or an online journal of teachers to students), teachers accommodate students' learning techniques, the use of social media *facebook* and improvement assessment rubric for scientific literacy.

TTS learning process that learned through the LS tested using observations and field notes of the observer in the classroom, while the students' scientific literacy data is obtained from the writing of the article being evaluated using the scientific literacy assessment rubric.

Data obtained from observation sheets and field notes were analyzed using data reduction and conclusions in the form of qualitative descriptive. Scientific literacy data of students was analyzed using a minimum value of student mastery of 75%. Value of minimum completeness follow a predetermined minimum value school.

#### 5. FINDINGS

Observations and reflections of LS team showed that scientific literacy skills during the learning process can be enhanced through TTS. All of the observers stated that the learning process can be applied through TTS to teach Biology subjects of class X with a different formula that trains students to hone his writing skills.

The process of learning that encourage students to read a lot of literature is categorized as a good learning process to train the scientific literacy of students according to the results of observations of LS team. The results reflect what the LS team mentioned that there are some improvements to be done so that the learning process is better through TTS.

Based on field notes and observations, it appears that when the TTS was first implemented, a few students do not fully focus on learning techniques

performed. This is apparent by the record of one observer Egi (February 12<sup>nd</sup>, 2014):

*'There is a student who is passive and some cool students chatting outside the material discussed, David stunned and can not give a conclusion of the learning activities today.'*

The above note shows that students are not familiar with TTS and the teacher have not been able to explain in detail the techniques that should be learned to students. The student looked confused at the time of writing the article. It becomes reasonable because previously students had not been trained to write newspaper articles.

In the next lesson the students had been more focused and no students were filmed or not doing anything. One solution that emerged from previous reflections have been able to be accommodated by teacher, the teacher during learning process continues to go around from one group to another group to anticipate if there are things that need to be asked by students, so that students are no longer stunned and increasingly focus on doing their task.

Ira and Herawati as observers also agree that:

*'learning conditions are generally going well and according to lesson plans, activities and group discussions in class discussion that has been properly conditioned, the teacher is always over and check the condition of the students during the learning activities, students are quite active in the group discussions as well as discussions of class discussion.'*

(taken from the reflection Ira and Herawati, February 13<sup>rd</sup>, 2014).

These notes provide meaningful input for the learning process in the classroom for the better. This can be seen in further learning is seen that each student got busy and focused with the writing of the article, the students began to run the learning activities in accordance with the instructions given by the teacher. Learning takes place when conditions indicate each student individually to create articles, classes for each student sits quietly busy with their respective task.

These improvements can not be separated from the input that appears on previous learning. TTS strategy can make learning more interesting than learning activities that have been carried out by students. This statement is in line with the notes written by the observer as follows:

*'The lesson that can be copied from the teacher summarizes the current model is a more old-fashioned look, making the article may be one strategy to make*



*students think creatively because there are opinions of the students in it.*  
(taken from the reflection Egi, February 18<sup>th</sup>, 2014).

The planning of future learning for the better, this is reflected in the students' learning process as noted by Ira following:

*'All the students are really active to improve the article, and complete the task on time. The student was very excited and interested in making an interesting article, and funny looks from their uniqueness gives the title, looking for references to find journal articles or related topics covered in the newspaper article that they make.'*  
(taken from the reflection Ira, February 20<sup>th</sup>, 2014).

The results showed that the reflection on the learning plan have been planned better so that the processes that take place in the classroom to be better than ever before. It also reflects that the teacher may or can provide direction in a systematic way and uses a light-weight language that is easily understood by students. Teachers wa also seen to be more relaxed than ever before, but remains firmly so that the goal can be achieved with good learning. Before the teacher made improvement and reflection on the learning process, there are still many students who are confused and dazed but after being given a lot of input, the students become work quickly, efficiently, and well-organized.

Improvements also appears on the learning steps *Terjun*, where technically, when students find literature online frequent internet connection problems so it appears that the teacher provides the input offline literature such as e-books. At the time of *Tulis*, the input appears that students should make the framework in advance using the questions as a guide. As well, when *Saji*, it is better to limit the number of newspaper articles pages so that every student has the same opportunity to write and read.

The conclusion that can be drawn from the results of observation and reflection during learning is TTS can challenge students to do the work of making a newspaper article so more students read literature, to think more of his opinions, more writing and more convey ideas. Students also seem to work hard doing its part as well as the author of the article information seekers.

The following syntax TTS learning that has been perfected in accordance with the input LS team.

Table 1 TTS Learning Syntax

Activity	Student Activities	Teacher Facilities
<i>Terjun</i>	<ol style="list-style-type: none"> <li>1. Reading textbooks.</li> <li>2. Viewing the contents of a text book.</li> <li>3. Creating questions about problems that arise.</li> <li>4. Seeking information.                             <ol style="list-style-type: none"> <li>a. Other reference sources.</li> <li>b. Interview (speakers).</li> <li>c. Experimental (laboratory).</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>1. Gives information on the topic of learning.</li> <li>2. Invites students to look for problems related to the topic of learning.</li> <li>3. Invites students to discuss the results of the plunge.</li> </ol>
<i>Tulis</i>	<ol style="list-style-type: none"> <li>1. Associating information obtained.</li> <li>2. Writing a reference source to the reference card.</li> <li>3. Discussing with friends and teachers.</li> <li>4. Writing a conclusion in the form of a newspaper article.</li> </ol>	<ol style="list-style-type: none"> <li>1. Invites students to associate information.</li> <li>2. Invites students to write a newspaper article.</li> <li>3. Observes student activities</li> </ol>
<i>Saji</i>	<ol style="list-style-type: none"> <li>1. Presenting newspaper articles in the media <i>facebook</i>.</li> <li>2. Mutually commenting on articles.</li> </ol>	<ol style="list-style-type: none"> <li>1. Provides a <i>facebook</i> group for the presentation of the article.</li> <li>2. Provides comments.</li> </ol>

Rubric assessment of scientific literacy is also changing during LS underway. Some things are improved in terms of picture details the assessment of students included in the article, there is not a final conclusion, and the relation of fact raised. Here is a repair section that is fixed for the LS process takes place.

Table 2. Scientific Literacy Assessment Rubric Beginning

Criteria	Skor	Explanation
Title	5	Title in accordance with the theme, informative, complete, consisting of short sentences and dense, interesting.
	3	Title in accordance with the theme, informative,

		complete, too long or too short.			demonstrates the ideas and views of the authors of the topics covered, showed no association with the idea of the possibilities of the current situation, please indicate which opinion is, do not indicate a problem solving.
	1	Title according to the theme, informative, incomplete, unattractive.			
Facts	30	This article demonstrates the present information which is supported by the fact, scientific studies, and contain clear information.			
	15	Article showed enough present information which is supported by the fact, scientific studies, and contain enough information.			
	10	Articles lacking shows present information which is supported by the fact, scientific studies, and contain enough information.			
	5	The article does not indicate present information which is supported by the fact, scientific studies, and contain information that is not clear.			
Idea (Opinion)	40	Article points out some of the ideas and views of the authors of the topics discussed, showing weak idea with possibilities of the current situation, shows that opinion is, indicate a problem solving.			
	30	Enough articles showing some of the ideas and views of the authors of the topics covered, enough to show the relationship of ideas with the possibilities of the current situation, please indicate which opinion for what it is, simply indicate a problem solving.			
	20	This article demonstrates the author's ideas and views on the topics discussed, has not show linkage with the idea of the possibilities of the current situation, please indicate which opinion is, do not indicate a problem solving.			
	10	This article			
			Writing Technical	10	Articles written in accordance with the provisions of which are: 1) containing a title, information, opinions, and conclusions; 2) do not contain any typos; 3) proportional; and 4) contain images / tables / graphs supporters.
				5	Articles written not in accordance with the provisions that: 1) contains the title is not yet complete, the information, opinions, and conclusions; 2) contains elements of typos; 3) proportional; and 4) does not contain images / tables / graphs supporters.
				1	Article writing is not in accordance with the provisions of which are: 1) does not contain a title, information, opinions, and conclusions; 2) often contain elements of typos; 3) disproportionate; and 4) does not contain images / tables / graphs supporters.
			Communicative	10	Articles written in good and right Indonesian and is in accordance with the enhanced spelling, sentence written attractive, and easy to understand
				8	The article has not been written in the good and right Indonesian language and is in accordance with the enhanced spelling, sentence written is quite interesting, and quite easy to understand.
				5	Articles are not written in the good and right Indonesian language and

		is in accordance with the enhanced spelling, sentence written unattractive and difficult to understand		scientific study, and contains information that is clear, is only equipped with a single image
Reference	5	Overall written sources used and listed in the article, there is no element had plagiarized other people.	40	This article demonstrates the present information which is supported by the fact (lab / reference sources / interviews), scientific study, and contains information that is clear, is not equipped with an image or a graph or table
	3	Not a whole written sources used and listed in the article, there is no element had plagiarized other people.		
	1	The source used is not written and included in the article, there are trace elements have others.	40	Article showed enough present information which is supported by the fact (lab / reference sources / interviews), scientific study, and contains enough information, supplemented with pictures or graphs or tables

Scientific literacy assessment rubric in Table 2 above have not shown a detailed account of the complexity of students' writing in a newspaper article as well as the diversity of ideas generated. LS team is able to provide suggestions and ideas to supplement aspects that scientific literacy so that the value of the article was finally able to reflect the results of the students' learning process through TTS. Here is a scientific literacy assessment rubric that has been repaired and used as a rubric for further assessment.

Table 3 Scientific Literacy Assessment Rubric Final

Criteria	Skor	Explanation		
Title	5	Title in accordance with the theme, informative, complete, consisting of short sentences and a solid, attractive		
	3	Title in accordance with the theme, less attractive, too long or too short		
Facts	50	This article demonstrates the present information which is supported by the fact (lab / reference sources / interviews), scientific study, and contains information that is clear, complete with pictures or graphs or tables	30	Article showed enough present information which is supported by the fact (lab / reference sources / interviews), scientific study, and contains enough information, not provided with pictures or graphs or tables
			30	Article shows the overall facts of information derived from the guidebook, complete with pictures or graphs or tables
	45	This article demonstrates the present information which is supported by the fact (lab / reference sources / interviews),	25	Article shows the overall facts of information originating from one internet source, supplemented with pictures or graphs or tables
			20	Article shows the overall facts of information derived from the Internet or from a single source

		guide book, is not equipped with an image		authors have not shown any conclusions
	15	Articles lacking shows present information which is supported by the fact both of guidebooks and other sources, it contains enough information, do not have a picture		10 Article only shows the author's conclusions are related to the overall facts obtained
	10	The article does not indicate present information which is supported by the fact, scientific studies, and contain information that is not clear, the picture does not fit the topic		5 Article shows that opinion is not related to the facts obtained
	5	The article does not indicate present information which is supported by the fact, contain information that is not clear and is not appropriate to the topic, not with pictures	Communicative	5 Articles written in accordance with the provisions that: 1) contains the title, facts, opinions; 2) do not contain any typos; 3) proportional; and 4) contain images / tables / graphs supporting
Idea (Opinion)	30	This article demonstrates some of the author's opinion on the facts obtained from various sources, the relationship between opinion with facts obtained, indicate the authors' conclusion		3 Article writing is not in accordance with the provisions of (one of the terms are not met), namely: 1) contains the title, facts, opinions; 2) do not contain any typos; 3) proportional; and 4) contain images / tables / graphs supporting
	25	This article demonstrates some of the author's opinion on the facts obtained from various sources, the relationship between opinion with facts obtained, the authors have not shown any conclusions		1 Article writing is not in accordance with the provisions of (two or more provisions are not met), namely: 1) contains the title, facts, opinions; 2) do not contain any typos; 3) proportional; and 4) contain images / tables / graphs supporting
	20	Single opinion article points to the fact that the author obtained from various sources, the relationship between opinion with facts obtained, indicate the authors' conclusion	Communicative	5 Articles written in good and right Indonesian and is in accordance with the enhanced spelling, sentence written attractive, and easy to understand
	15	Single opinion article points to the fact that the author obtained from various sources, the relationship between opinion with facts obtained, the		3 The article has not been written in the good and right Indonesian language and is in accordance with the enhanced spelling, sentence written is quite interesting, and quite easy to understand

	1	Article is not written in the good and right Indonesian language and is in accordance with the enhanced spelling, sentence written unattractive and difficult to understand
Reference	5	Overall written sources used and listed in the article
	3	Not a whole written sources used and listed in the article (the only two sources that are listed on at least three sources that are required)
	1	The source used is not written and included in the article

17	Franklin Marselau	46	78
18	Gary Prayogo	46	71
19	Gracia Stefani	41	78
20	Ivonne Virginia W	46	84
21	Jesslyn Ivana Joviaal	39	81
22	Joannes Mahestra R	61	63
23	Jonathan Siswanto	46	84
24	Kevin Alvaro H	61	78
25	Laurensia Vania Dwi	44	74
26	Maria Angela L	44	98
27	Marieta Monica	44	96
28	Meliana Marditan	41	91
29	Michael Wibowo	41	81
30	Monica Fidelia T	46	89
31	Nathania Livia Wima	42	83
32	Patrick Feriano S	44	71
33	Reforma Setiana	42	89
34	Revena Astanti P	61	96
35	Reyneldis Karmelita	46	66
36	Safitri	46	71
37	Stefan Theodoric	41	49
38	Steven Gosal	44	62
39	Valerie Angelina H	41	66
40	Vania Saphira W	39	73
41	Wilhelmina Lorenza	46	49
42	William Kurniawan	41	62
<b>Average (%)</b>		<b>45</b>	<b>77</b>

Improvement of scientific literacy assessment rubric indicates that LS is not only improve the learning process, but also improve the assessment process so that the end result may be a reflection of the learning process that takes place.

Increased literacy of students has increased quite good during the learning process. It can be shown from the data in Table 4 below. Improved writing articles as a result of learning TTS tune with the learning process improvement experienced by the students. Writing a newspaper article can be a reflection that the students read literature well, doing lab work well, express their opinions, and summed up the results of his study. The increase also reflects the value of the scientific literacy of students understand the directions given by the teacher. In addition, the increase in this value also shows that take place in a conducive learning process.

Table 4 Scientific Literacy Assessment

No	Students Name	Article	
		Pre	Post
1	Albertus Emilio K	44	84
2	Alicia Alberta	46	93
3	Alyssa Geraldine	42	93
4	Billy Christian	44	79
5	Budianto Santoso	41	88
6	Christian Tjahja	39	93
7	Christin Siane	41	80
8	Christopher G	61	78
9	Cindy Olivia	44	53
10	David Christian F	42	78
11	Edwin Sanjaya	39	88
12	Eisye Alvinia Gosal	61	53
13	Eldridge Rexroy E	42	68
14	Eric Hansen Irawan	44	66
15	Felicia Aileen Genial	46	95
16	Florentina Evelyn P	41	68

Scientific literacy assessment conducted before students are given learning TTS and after students are given learning TTS. Based on the table above, an increase in the average value of the scientific literacy of 32%. This increase looks very well be due to the new students first wrote newspaper articles and first time doing crossword learning strategies. Average increase also shows that through LS, the value of scientific literacy of students can be improved.

## 6. DISCUSSION

The above findings indicate that the LS is able to improve the learning process (preparation of lesson plans and how to teach) and learning outcomes include increased scientific literacy (the assessment process). LS was able to form a collaborative team focused on making a formula learned that the learning objectives achieved. Required to learn the right formula for the TTS is a new strategy that is raised, the result of the modification of TTW. LS to be a means to see the extent to which TTS can be applied and can improve scientific literacy.

LS were becoming more student centered as teacher began to encourage students to share, discuss, and debate their solutions and errors. Teachers began to develop a shared vision of what good teaching looks like and teaching began to develop greater consistency throughout school (Stepanek, 2007).

LS-based TTS creates a more challenging learning environment for students and experienced improvement from one meeting to another meeting. Syntax of TTS also be more appropriate, for example when *Terjun*, the syntax for the better with the feedback that better teachers provide resources in the form of an e-book offline so that students do not need to be difficult when there is a problem with internet connection. According to Cerbin (2011) LS makes the otherwise mostly private domain of the classroom a site for systematic study and knowledge building.

Further it can be explained that as a new learning strategy, TTS requires LS to improve the learning stages. Cerbin (2011) states that LS try to improve teachers practice in a multitude ways such as by updating their courses and materials, adopting new teaching practices, creating new assignments, and using alternative methods to evaluate students. LS instructors collectively can examine their goals for student learning, discuss student difficulties with the subject matter, explore how instructional strategies can support specific forms of learning, create a class lesson intended to bring learning goals to life, investigate how students learner do not learn from the lesson, observe students as they react and respond to classroom instruction, analyze multiple sources of evidence about student learning, and use evidence of student learning to revise teaching.

This study also shows that the TTS is able to improve the learning of scientific literacy of students. TTS is able to deliver better results because in the learning step involves stages that are able to support this increased scientific literacy. Stages in learning TTS was observed (see, read and hear), in which the students will be trained for the stage of searching for information that triggers any questions. The question that arises is of course expect answers so that students will return to dig up information as a result of asking. Excavation continued information can be made with the experimental observation of such bacterial colonies and observations protists also through the collection of information through the internet. This kind of activity will encourage students to gather facts more than just writing in the regular student worksheet. The most important thing is to increase scientific literacy writing activities, through student can write their ideas and observations that can be passed on to others and can tell a phenomenon that occurs, the problem that is found, it describes and explains the observations (either from reading, viewing, and listening), and explain the data through the evidence found.

Phases of TTS activity are in accordance with the words of Century (2001) who wrote that research have examined various language-based strategies for development of scientific understanding that

begins with direct experience. The techniques include:

1. Reading from scientific journals, the popular press, and the internet;
2. Writing of individual student scientific journals with reflections on classroom or laboratory experiences;
3. Collaborative writing about the scientific work of a group of students;
4. Laboratory notebooks using templates that guide student thinking and elicit critical evaluation of evidence that supports their own or others' science claims;
5. Informal discourse among students for the peer exploration of original ideas;
6. Formal individual or group presentations of well-organized and well-defended thinking; and
7. Discussion, questioning, and debate that stimulates clarification of thinking and simulates the discourse that occurs in the scientific community.

Communication skills is important in 21<sup>st</sup> Century skills, where students practice their knowledge by informing others about what they do and develop effective explanations, construct and maintain the opinion, and provide appropriate responses to critical comments about their explanation.

## 7 CONCLUSIONS

The results of this study indicate that a new learning strategy drawn up by the teacher as an innovation to accommodate the students' life skills is by means of LS. Learning TTS which is a result of the new strategy be taught to students using the LS will get the right formula in terms of both the learning process and also of the assessment of scientific literacy.

TTS-based LS is applied to the subjects of Biology Class X is able to provide improvements in measures of learning and scientific literacy assessment rubric so that learning can take place better.

## 8 ACKNOWLEDGEMENTS

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## The Indonesian 2013 Curriculum Implementation: Understanding and Barriers

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**Abstract:** Teacher plays a crucial role in the process of curriculum implementation. This study was conducted to investigate the teacher's understanding about the Indonesian 2013 curriculum and the teacher's barriers in implementing the current curriculum. This investigation involved one female English teacher who works for a secondary Islamic boarding school in Subang, West Java, to be the subject of this study. Employing case study as its research design, this study used observation and semi-structured interview as its main data collection means. The finding of this study reveals that the teacher had well-understanding about the demand of the 2013 curriculum. It was reflected from her argument which stated that the 2013 curriculum is the development of the previous curriculum. The 2013 demands the teacher to be the facilitator, not to be the one who knows everything, because the curriculum clearly requires the students-centered should be applied in the process of teaching and learning activities. Even though the teacher possessed well-understanding about the curriculum requirements, the teacher still found some barriers in meeting the ideal implementation as mandated by the 2013 curriculum. Some of the teacher's obstacles in implementing the 2013 curriculum are having big class, over workload, and insufficient learning resources.

**Keywords:** Indonesian 2013 curriculum, implementation, teachers' understanding and barriers

### 1 INTRODUCTION

The development of educational needs always opens possibility to reform the existing curriculum. Richard (2001:27) stated that the change of need in the field of education is one of the factors which influence the need to change or reform the existing curriculum. Guskey (2002) and Villegas-Reimers (2003) commented that curriculum transformation is also affected by the changes of political as well as educational paradigm. In relation with this case, Indonesian government through the Ministry of National Education has launched new curriculum, namely the 2013 curriculum. Syahmadi (2014) noted that this new curriculum is believed as one of the Indonesian government's continuation steps to improve the previous curricula such as KBK 2004 (Competence-based curriculum 2004) and KTSP 2006 (School-based Curriculum 2006). This idea is supported by the statement of Indonesian minister of education and culture, M. Nuh as cited in Alwasilah (2013) who said that the 2013 curriculum is essentially an improvement of preceding curricula. M. Nuh emphasized that the 2013 curriculum really promotes character education and critical as well as creative thinking culture to cultivate the betterment of quality of Indonesian education.

The settled curriculum will never be successfully implemented if the curriculum implementers do not

have sufficient knowledge about the curriculum itself both conceptually and technically (Durlak&Dupre, 2008; Mafora&Phorabatho, 2013). One of the curriculum implementers is the teacher. Richard (2001) argued that the teacher holds a vital role in succeeding the curriculum implementation. In his view, teacher is the one who interprets the instructional planning stated in the curriculum into sets of teaching and learning activities. Richard (2001) further believed that the quality level of teachers' ability in specifying the instructional planning stated in the curriculum is affected by several pedagogical factors such as teaching experience, skills, training and qualifications, morale and motivation, teaching style, and beliefs and principles. Specifically, Marsh and Willis (2007) asserted that the success of particular curriculum implementation in the process of teaching and learning activities relies on the teacher's understanding about the curriculum itself. The teacher's understanding about the curriculum will affect the teacher's choice on teaching approaches and learning materials. When the teacher possesses well-understanding of the curriculum demand, he/she can provide learners' learning outcome as mandated by the curriculum. Thus, there is a wide possibility to find different curriculum interpretation among teachers since they have diverse pedagogical competences as well as curriculum understanding.



Research on the area of curriculum implementation has revealed that the curriculum implementation has various problems in practice, even though the curriculum has been planned and designed as perfect as possible. Mafora and Phorabatho (2013) have investigated the implementation of new curriculum in South Africa. This research studied the perceptions and experiences of School Management Teams regarding their roles in managing the implementation of National Curriculum Statement (NCS) as curriculum change. Using multi-site case study, principles of secondary schools in the Moretele Area Office, North West Province were selected purposively to be the participant of this study. The finding of this study reported that most of the school principals have inadequate understanding of their roles in implementing new curriculum and also have difficulties in managing the implementation NCS. Among those difficulties are lack of training, lack of relevant resources, lack of district office support, and unreasonable workload for principals.

In the context of the implementation of the Indonesian 2013 curriculum, some research also reported that the implementation of this recent curriculum cannot be free of difficulties in reaching the ideal implementation. Muniroh (2014) has studied seven English junior high school teachers in Malang city. This study informed that most of the teachers had lack of understanding on the concept and implementation of scientific approach. It is also reported that the teachers found obstacles in assessing students' manner competence. With the same notion, Shofiya (2013) conducted a research to dig the teachers' responses toward 2013 curriculum. Using survey method, this study involved sixty senior high school teachers to be its research respondents. The finding of this study informed that most of the teachers had positive response to the 2013 curriculum. They stated that implementing the 2013 curriculum was not a big problem for them. However, students' assessment became the most complicated issue to implement for the teachers.

Seeing the fact that the implementation of new curriculum cannot be far away from barriers, this current study would like to investigate the English teacher's understanding and barriers in the implementation of the Indonesian 2013 curriculum, particularly in the context of English subject. It is expected that the finding of this study could enrich the information about the teacher's understanding and difficulties in implementing the new curriculum which has been promoted by the previous research. Hopefully, this few information as revealed in the finding of this present study could be a valuable resources for the school management boards, English education practitioners, and English curriculum developers to develop some alternatives in coping with the problems of Indonesian 2013 curriculum

implementation. It is also hoped that the finding of this study is useful to generate other fresh research ideas on the same topic discussed in this study for revealing some other precious information to succeed the implementation of the Indonesian 2013 curriculum.

## 1.1 Research Question

This study was conducted to answer these following research questions:

1. What is the English teacher's understanding about Indonesian 2013 curriculum?
2. What are the English teacher's barriers in implementing Indonesian 2013 curriculum in the context of English subject?

## 2 RESEARCH METHODOLOGY

This study aims to respond the formulated research questions. It was a qualitative study in design. Since this study tried to uncover the English teacher's understanding about Indonesian 2013 curriculum and their barriers in implementing the current curriculum, a single case study was applied as its research approach. A case study is defined as “empirical inquiry that investigates a contemporary phenomenon within its real life context” (Yin, 2011, p. 13). Nunan (1992) supported that single case study is commonly used to explore a single case or single instance. Particularly, Heigham and Croker (2009) mentioned that single case study generally describes intrinsically the case itself. Thus, “there is no attempt at all to generalize from the case being studied, compare it to other cases, or claim that it illustrates a problem common to other, similar cases” (p. 69-70).

### 2.1 Research Site and Participant

This study was carried out in an Islamic Boarding Junior High School in Subang, West Java. This school was selected to be the research site of this study mainly because of the researcher's convenience to access this educational institution. Since the case addressed in this study was the implementation 2013 curriculum in the field of English subject, a female English teacher participated to be the research participant of this study. Bogdan and Biklen (1992) agreed that an individual can be a research subject in case study. Moreover, Mackey and Gass (2005) contended that case study

allows taking single individual to be the research subject. They, in further, said that small group of research subject enable the study to provide detail description of specific issues being investigated.

The research participant was selected because of two considerations. First, she had possessed more than two years experience of teaching English as a foreign language. Second, she had experiences in implementing KTSP curriculum and also 2013 curriculum. However, her willingness to be the subject of this study was actually the main consideration above other considerations of research participant selection.

## 2.2 Instruments

Interview and observation became the two main research instruments for collecting the needed data regarding the issues addressed in the formulated research questions. Interview was used by to gain information about the English teacher's understanding on 2013 curriculum. In addition, interview was also employed to clarify some unclear points found in the observation. The interview process was conducted by hiring some guiding questions which need direct response from the research participant. Meanwhile, direct observation was occupied to elicit the data on how the research participant implement 2013 curriculum in real practices of English language teaching and learning. A field note was used to record the important facts which relate to the topic being studied. The information got from both interview and observation was always crosschecked to reveal trustable data and coherent justification as well as increase its validity (Creswell: 2009, p.191; Fraenkel and Miller: 2007, p.594).

## 2.3 Data Analisis Technique

The collected data from interview and observation passed three major steps of data analysis process. The first step was transcribing. In this stage, the recorded data were transcribed, particularly the interview data. Meanwhile, transcribing the observation data was done by rewriting the important points which were recorded on the field note by using computer. Therefore, the information on the field note was easier to organize. The second step of data analysis was coding in which the data were categorized based on their characteristic similarity by putting a label on each category. Finally, the labeled data were interpreted for eliciting the general ideas to discuss which would be treated as the findings of this study.

## 3 FINDINGS AND DISCUSSION

The ideas generated from both the interview and observation are discussed under two major categories,

namely the English teacher's general understanding about Indonesian 2013 curriculum, and the English teacher's barriers in implementing Indonesian 2013 curriculum.

### 3.1 The English Teacher's General Understanding about Indonesian 2013 Curriculum

The information about the English teacher's general understanding about Indonesian 2013 curriculum was acquired mainly from interview. From the interview, it was revealed the research participant of this study showed her well-understanding on the case of general knowledge about Indonesian 2013 curriculum. All the data from interview indicated that the participant of this study highlighted three points which were being typical feature of Indonesian 2013 curriculum.

First, the participant of this study viewed that 2013 curriculum was basically not a new one, but the development of KTSP curriculum 2006.

*“...menurut saya, kurikulum 2013 itu bukan sesuatu yang baru, melainkan pengembangan dari KTSP 2006. Intinya mah sama saja. Hanya bedanya kurikulum 2013 lebih menekankan pada pengintegrasian nilai budi pekerti, pengetahuan, dan keterampilan dalam setiap pembelajaran. Ini yang tidak menonjol di KTSP 2006....”*

The interview excerpt above informed that the teacher assumed that there were no many differences between KTSP 2006 and 2013 curriculum. She mentioned that 2013 curriculum required the integration among the competence of skill, knowledge, and behavior in every teaching and learning process. This point was not emphasized in the KTSP 2006. This teacher's understanding is seemingly confirmed by Syamhadi (2014). Syamhadi pointed that 2013 curriculum requires the teaching and learning activities should not only focus on students' knowledge development which is usually textbook-based and teacher-centered in style, but also their characters and skills to implement the knowledge that the students have learned. It means 2013 curriculum actually desires teaching and learning activities are able to create active, meaningful, and respectful learning atmosphere. In this sense, the students are being the main actor of learning activities who love to explore particular knowledge and are skillful in implementing the obtained knowledge in real life context by taking high responsibility on every learning process they pass. This idea was supported by Suherdi (2012) who said that students' good character and behavior is also an indicator of successful education. In other words, it is expected that teaching and learning activities conducted in formal school are able

to produce knowledgeable individuals with high value of good behavioral personality.

Second, the participant of this study claimed that 2013 curriculum promoted students-centered learning activities. In this case, the teacher plays a role as facilitator who helps the students acquiring knowledge, not as a producer of knowledge.

*"...paham pembelajaran yang didengungkan oleh K13 kan scientific approach yang menuntut siswa aktif di setiap aktifitas belajar. Ini kan artinya guru bukan lagi subjek pembelajaran, melainkan murid. Fungsi guru lebih banyak ke fasilitator bukan orang yang segala tahu. Makanya guru harus lebih kreatif lagi dalam merancang pembelajaran agar murid mau mikir dan tidak terlalu bergantung pada guru. Ya... selain media dan strategi pembelajaran juga harus kreatif yah...."*

The teacher's response above indicates that the teacher had been really aware that 2013 curriculum demands activities-based learning, not content-based learning. It means the teaching and learning activities provide more spaces for students to learn and less space for the teacher to explain the learning materials a lot. This teacher's assumption goes in line with the statement of Hamied (2014) that there are two key attributes of the 2013 curriculum namely science-based and holistic. Science-based is defined as learning activities which involve students to think critically about the learning content that they discuss in the lesson. Meanwhile, holistic learning activities suggest that learning activities do not focus only on students' mastery of learning material concepts, but also should be integrated with other learning competence such knowledge implementation skills and social skills as well.

In order to support science-based learning environment, the teacher thought that she had to be able to equip herself with numerous teaching strategies as well as creativity to develop teaching and learning media. It is all needed to serve learning activities which is appropriate with the curriculum requirements and students' learning characteristics as well. Syahmadi (2013) also proposed the same ideas as the teacher's. He argued that the 2013 curriculum gives wide room for teachers to be a creative educator. It is purely because the 2013 curriculum yearns for meaningful and holistic learning which demand meaningful teaching media, meaningful learning sources, and authentic assessment. Thus, all learning activities should support students not to be a knowledgeable man only, but also a dexterous man as well.

Finally, the teacher admitted that the 2013 curriculum is the curriculum which really wants the teacher to be a progressive learner in term of teaching skills. She believed that being a facilitator for students as mandated by the 2013 curriculum is not only a matter of facilitating them with learning equipments,

but also a matter of guiding them to achieve the intended learning goals.

*".....menjadi fasilitator disini bukan berarti guru membiarkan murid belajar sendiri ya. Mencari sendirian tanpa arahan, kemudian gurunya enak-enakan menyuruh-nyuruh mereka lakukan ini, lakukan itu, dan sejenisnya. Tapi, justru ini menantang guru untuk terus menambah kapasitas pengetahuannya supaya ia bisa menjadi pembimbing murid untuk bisa memperoleh esensi dari setiap aktifitas belajar yang mereka lalui. Bagaimana bisa jadi pembimbing yang baik, kalau sendirinya cuma tahu sedikit tentang ilmunya? .....yang jelas, gurunya kudu mau terus belajar weh..."*

To be able to become a good learning guide for students, the teacher was really conscious that she needed to always upgrade her English subject knowledge as well as teaching skills. The improvement of teacher's professionalism capacity, in her opinion, was necessarily to do for being a good learning advisor for her students. Therefore, the teacher could be a trusted person in terms of English knowledge possession for the students to rely on whenever they find difficulties in overcoming their learning tasks. Here, it is clearly seen that the teacher has positive spirit to be a learner-teacher in doing her profession as an English teacher. This positive teacher's attitude is supported by Suherdi (2013) who stated that being a real teacher is actually being a lifelong learner. A good teacher is the one who is able to take something constructive to learn from every single process of teaching and learning activity he/she passes.

Those are the three general understandings about 2013 curriculum hold by the English teacher who becomes the participant of this study. It is clearly seen that the teacher seems having well-understanding about the 2013 curriculum. Even, she knows what needs to do to deal with the demands of the 2013 curriculum regarding to be a professional English teacher.

### **3.2 The English Teacher's General Understanding about Indonesian 2013 Curriculum**

Those are the three general understandings about 2013 curriculum.

Even though the teacher has well-understanding about the 2013 curriculum, it does not mean that she is free of barriers in implementing the curriculum. The data obtained from interview and observation evidently indicated that the teacher faces some problems to deal with along the process of implementing the 2013 curriculum. It is noted that, at least, there are three general obstacles felt by the teacher when implementing the 2013 curriculum,

namely big class, over workload, and learning resources deficiency.

Handling big class is seemingly being the main issue to be concerned by the teacher. The classes that the teacher handles have thirty up to thirty four students in general. This big number of students precludes the teacher to do authentic assessment holistically. She has difficulty in assessing students individually when the teaching and learning activities are running in the classroom.

*".....kelas besar itu hingga saat ini masih menjadi kesulitan yang paling saya rasakan. Karena, K13 menghendaki authentic assessment dalam setiap pembelajaran yang berlangsung. Tapi bagiku masih agak sulit untuk melakukan authentic assessment secara sempurna kepada setiap individu yang ada di ruang kelas....."*

In addition, big class still also becomes the major problems in giving more English exposures to the students. The teacher wants more English activities which require students to get involved actively on it, but she does not have much time to explore students' English performance. This problem, more or less, happens because there is no balance between the provided time and the number of students. However, the teacher said that big class would be no longer her major problems in performing ideal assessment as required by the curriculum as long as it is supported with 'normal' workload.

Over workload is then being the second teacher's barrier of having ideal implementation of the 2013 curriculum. The teacher revealed that she had to teach 24 hours plus four hours extra classes for national examination preparation in a week. The school where the teacher works applies different system from other schools. It has national examination preparation for nine graders earlier than other schools generally do. The program of national examination preparation is usually done since the beginning of school academic year. This preparation program is usually conducted at 1 PM until 3 PM from Monday to Friday. Therefore, the regular class is organized only up to 12 PM.

*".....saya harus ngajar 24 jam seminggu. Belum ditambah 4 jam pemantapan kelas 9 sore harinya. Jujur, jam ngajar ini kebanyakan bagi saya. Terlebih, kalau saya dilibatkan dalam kepanitiaan suatu kegiatan sekolah. Hampir habislah waktuku untuk mengajar dan mengurus hal-hal lain sampe sore. Sebetulnya, saya ingin mengkreasikan metode dan media pengajaran. Tapi, apalah daya... keinginan tidak selamanya mulus terlaksana. Hasilnya, yaaaa, seperti yang kamu lihat, hanya sebatas yang saya mampu lakukan. Semaksimal dan sebisa saya....."*

It can be seen that over workload affects the teacher's work quality. Actually, she has strong desire to be maximal in her teaching performance, but the reality does not provide energy to accomplish it. More than 24 teaching-hours have forced her to have lesser

time for preparing and designing various teaching methodologies which fit with the students' learning needs. However, it does not mean that the teacher performs teaching and learning activities monotonously in the classroom. There were some variations of teaching methods and learning activities, but not really distinctive.

Furthermore, the teacher also complains on the lack of learning resources for students. She informed that the boarding system does not allow students to access internet. The internet can be accessed by the students only when they study ICT subject. This condition is worsen by the fact that the students only have one English handbook and the library provides limited numbers of English textbooks or other relevant English books which are needed by the students. The teacher feels that this kind of situation sometimes becomes the students' main reason for not being a resourceful learner.

*".....karena sekolah ini boarding, masalah lain yang sedikit menghambat pelaksanaan scientific approach itu ketidakbisaan murid untuk mengakses internet setiap saat. Ga apa-apa sih ga pake internet juga, asal ada referensi-referensi buku yang bisa dipakai murid. Tapi nyatanya, jumlah sumber belajar bahasa Inggris di perpustakaan juga terbatas. Yaaa ambil positifnya aja sih. Jadi, saya bisa mengeksplorasi kemampuan bahasa Inggris anak-anak lewat sumber belajar lain, selain buku, yang ada dilingkungan sekolah....."*

It can be seen that the teacher found the inadequacy of learning resources for enhancing the students' scientific ability. Nonetheless, this limitation did not make the teacher to have lesser energy and spirit to perform her best teaching performance. It precisely motivated the teacher to develop her creativity in teaching by involving whatsoever learning materials which could be found in the school environment. In short, the teacher seems to be able to cope with the problem of accessing internet and English textbooks inadequacy.

#### 4 CONCLUSION

The implementation of the 2013 curriculum is perceived positively by the teacher, especially the teacher who teach English subject in an Islamic Boarding Junior High School in Subang. The teacher shows her well-understanding about what to do with the 2013 curriculum, a curriculum in which she has just dealt with it for about five months. The teacher views that the 2013 curriculum is basically not a new curriculum. It is just the development of the previous curriculum namely KTSP 2006 curriculum. This curriculum, in the teacher's mind, promotes students-centered learning activity which should incorporate moral values on every learning activity done in the classroom. In this case, the teacher realizes that the

teacher' role in the process of teaching and learning activities is mainly to be a facilitator for students. It means the teacher is not a knowledge provider anymore for the students, but it has been shifted to be a students' learning advisor who help students to cope with learning difficulties.

Unfortunately, the possession of well-understanding about the curriculum does not make the teacher free of barriers in having ideal implementation of the 2013 curriculum. This study has highlighted three major problems of the 2013 curriculum implementation felt by the English teacher who has been the participant of this study. Those three major barriers are having big class, over workload, and learning resource inadequacy. However, these barriers seem not to decrease the teacher's motivation for always improving her teaching performance by being a creative teacher in handling with the insufficiency of supported learning and teaching facilities.

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## Connecting Content and Children Contextual Life Within GagasCeria Preschool Classroom Activities

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**Abstract:** Preschool activities have to contribute to all aspect of development and provide the opportunities for children to learn easily about whole the world and their daily life. Children activities in preschool classroom have little benefits if the content is not connecting to the learner's daily life and meaningful for children. To support that opportunities, preschool teacher need to reflect the lesson regularly and design the activities carefully consider to these main point: the children, the purpose, the activities narrative, the classroom environment, and the materials. The authors would like to describe that Lesson Study process could brings out the progressive impact on teacher's depth reflection and better designing of children activities. The selection activity of this presentation purposed to build the children understanding on science theme and bring it in daily life scheme at GagasCeria preschool in Bandung – Indonesia.

**Keywords:** Preschool, contextual learning, teacher's reflection

### A. INTRODUCTION

GagasCeria preschool implements the thematic strategy to tell this concept the children. The thematic strategy was chosen because has several advantages, including child-centered, to give direct experience for children, combining some or even all development field (cognitive, language, motor, social and emotional) in accordance with children interest.

The character of preschool children in knowing and perceiving a thing or concept is through the activity that is contextual and matter to them. It is concerned with the theory of a pre Piaget when 2 -7 years children experienced pre-operational.

In this stage they already had mental representation and got a better consideration and able to use symbols (Boeree, 2005). Because of the implementation of the thematic approach in GagasCeria, the theme becomes a tool for dressing the knowledge concept and content that are contextual to be more attractive to be explored by children. Through the theme children are asked to conduct a study of the scientific unimaginitive and social awareness about phenomena in their area. The theme that is used in GagasCeria have a goal starts from knowing themselves and then to contribute to their environment. Theme will be clad in an interesting scenario as written by Sandra Rollins Hurley , Ph.D and Sally Blake Ph.D, in an article of *Animals and Occupations : Why Theme-Based Curricula*, early childhood education in the journal .

*"Almost every child care center and preschool has used a theme-based curriculum at one time or another. Thematic units are popular among young children and teachers alike. What many early childhood educators don't realize is that the use of thematic units provides an integrated approach to teaching and learning. Such an integrated approach is supported by research on how the brain works and how human beings learn. Ultimately, the use of thematic units helps young children achieve higher levels of learning. (Hurley and Blake, 2008)"*

#### 1. Wheel theme

In GagasCeria, the selection of theme depends on children interest and all things familiar with them. So does with the selection of topics on every single week. This happens when we choose wheel theme as one of ways to introduce the concept of science and technology on children. The consideration is because the objects that and how it works can be found in their environment and familiar in children everyday as on car, a bicycle, stairs , slide, etc. The topic that is discussed every single week always associated with a children interest and trend in the everyday life.

To make the concept of a wheel interesting for children, we designed a variety of activities that can be explored actively by children. Toys that are designed on this theme are car's

miniature; geometry block with the circle shaped side, square and triangular, etc. on track, experiments and moving objects with a wagon or trolley, dramatize as a wheel to understand the meaning of spin and rolling, etc. All playing activities expected to help children understand that wheels on objects they play has a spinning working principle and make it move faster.

## 2. The Finding: How lesson study cycle solve the problem

It is not easy to introduce the wheel theme for the teacher. The consistency of activities with the purpose of the theme must remain maintained by teachers. On the wheel theme usually teacher stuck on only introduce the concept of a kind of vehicle and its functions. So the purpose of theme to introduce the simple concept of science not delivered. On the theme, the goal is to build children understanding about the working principle of a wheel that rotates and rolling as well as to make people work easier. The conditions in instrument and environment class that less supportive on achieving the concept of the theme of it is very possible. Such as when teachers provide activities and instruments, the possibility is that the children are more interested to get to know different types of cars than the function of a wheel according to the form and its size. Guidance and response from teachers need to plan well so children have deep curiosity on the concept that appropriate to theme.

To know the education success of the theme, teachers agreed to do lesson study as an instrument for examining the effectiveness of the child in introducing the simple concept of a wheel. Lesson study on the wheel is made to check activity at the age of three classes for three days in a row.

### 2.1. Learning process at first class

In planning the lesson study in first class, we and the team design an activity in form of story that a problem as an activity prologue and also provocation activities for children do observations on the wheel.

The story begins by presenting provocation story by the presence of a crew schools who will move 20 mineral water boxes but he cannot continuing the activity because his hand hurt after tried to lift several bags of the mineral water.

By observing the phenomenon that occurs, the teacher tried to encourage children to have the sensibilities in finding the actual problem

.The teacher asks, 'what can we do to help the crew?' Without answer, spontaneous children help the crew raised the mineral water boxes. At the middle of the process of moving boxes, the school crew asks the children about the easiest and the fastest way to move dozens of boxes of mineral water. Then children were given time to make a prediction of suitable way and exchanging ideas with their friends to finish the process of transferring the boxes more quickly.

Then children are doing various activities with a simple experiment using toys at class in order to: 1. find the right tools to help move heavy objects, and 2 to prove their opinion. Some area prepared for the experiment activity are 1.the miniature experiment of carrier equipment with a number of the burden of various choices of wheels in form of the geometry of a circle, a triangle, and square, 2.the move book with circle wheel of various sizes, and 3 imitate wheels writing.

### 2.2. Lesson study reflection in first class

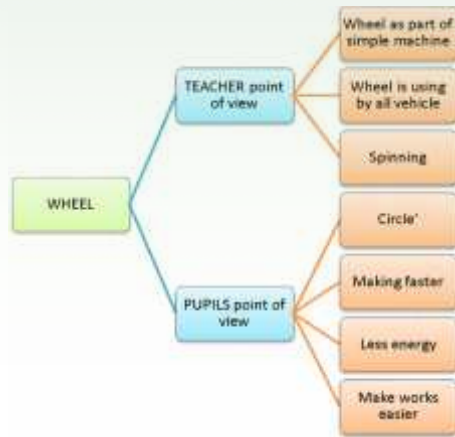
In a first class reflection session, we found that the purpose that will be used in lessons in first class or water class still in form of abstract not focusing on children . At first the teachers expected that the children know if a wheel is one instrument that could make the work easier. The purpose which are still abstract in teacher's mind affected in setting instrument and selection material, such as an area to invite children to prove about the form of a wheel is a circle (the activities of making a carrier equipment with a variety of the wheel in form of geometry), but in other areas instead already proved that a wheel shaped is circle (moving books using circled shaped equipment in various size).

The other reflection point is that to educate children focused on the number of the burden that will be transported, not the form of a wheel that is used .This happened because the questions from teachers make children response not accordance with the proof that have already been done . The question from teachers is, “Which carrier equipment that can lift more weight in addition?” There are activities wrote RODA word that process the ability to read and write, whereas these activities not relating to the mission will be done by the children.

### 2.3. Lesson plan for second class

Based on the reflections on the earlier class , we will improve the purpose of learning .Teachers asked to formulate more about the

concept will be discussed based on the perspective of children, because the purpose formerly based on teachers perspective which is abstract. These are the description of basic thought of wheel concept based on the perspective of teachers and children.



After formulating the fundamental concept of a wheel based on teachers and children perspective it was finally decided that that objectives of the activities lesson design in the next class will lift the purpose which is based on children perspective, so that the children know that the wheels is circle and ease a job.

Then the lesson design was made based on the prediction of positive response and negative responses that might emerge from the children. The negative responses that appear make teachers indirectly think of an intervention so that the response becomes positive. Intervention will guide teachers to achieve goals that had been determined. The next step is to make lesson study plan in our class as second class. Based on lesson design and children characteristic, we decided to make the purpose of learning activities more concrete that the children know that the wheel shape is circle. The learning method used is a discovery method where children will find by themselves the purpose of learning at that day through experiment activities.

#### 2.4. Learning process in second class

In accordance with the flow that already made, we purposely eliciting problem on how to help school crew who have difficulties carrying boxes of mineral water to a warehouse. The children spontaneous push boxes of mineral water; working together to lift the box or even tried to carry by them. All feel exhausted. Then school crew say that he still has tens other boxes. The children excited to help though

know that it will make them feel tired. But now the children agreed will find the fastest ways and easiest way to help crew carry boxes of mineral water whose amount is tens so that children and crew did not feel tired.

At first time, we did discussions with children. There are many responses from them; some of them is helping by using truck, using trolley, cart. From the discussion, we found that all mentioned equipment uses wheel. And asking questions to children, “With what form of wheel should be used?” All the answer that a wheel was a circle. To prove their opinion we invite children do various experiments in some area of activity.

#### 2.4.1. Small group area

One of the area in our lesson study activity is using geometry block as parts of wheels. First children given a single container containing miniature of people and some things. The container parable as carrier vehicles. And children asked to deliver people who were in it from one point to end point by using various wheel. The children asked to do experiments with various wheel to see what form that can easily move without using many power. Each children can select 3 wheel-in same shape for the test.

When did the experiment, there are some children who quickly arrange wheel under the container and pressing the container above so that a wheel is sticking in a container. There are also children who use the form of that geometry as a motor of container by moving one wheel to another wheel to front so that the container can be moved. Some decided to use only two wheels and put it in vertical position as if a wheel is a bridge. But even so the comments were almost all the same, “A circle wheel should not need to thrust frequently,” said one child. “The fastest is the wheel that is circle,” said the other children.

#### 2.4.2. Choice Time Area

In this area there are two types of experiment both used miniature carts that will be tested by replacing every wheel which have diverse form of geometry (square, circle, triangular). The difference is on one spot using the 3 dimensional forms of geometry and the other of using the 2 dimensional form of geometry using sponge.

On both spot the children spontaneous furnish the miniature container with a circular



shape wheels and test it along 1 m line along provided by teacher. They cheering see the container fast. Then teacher motivate the children to use other shape of wheel as a comparison. They had tried this out on the same track. After the entire test the response that appear as follows, ‘the coolest and the fastest is this’, pointing to circle wheel. Now another response that arises is he tried to associate miniature wagon wheel with a complete circle like *hot wheel s*, this is *hot wheels* fast speed’ while pointing miniature wagon- with circle on track.

### 2.4.3. Children finding’s application

Various kinds of responses reflected by the children expressed the interests on the experiment. However, in the session describing the results of the experiment in every spot, all the children described tools that equipped circle wheel.

At the next meeting, the children tried to apply the results of the experiment has been done to help crew who have trouble moving boxes of mineral water. They just looking for instruments around the school that can help move those boxes focus to seek instrument that have wheel-shaped as they have experience the results of experiments that they have done before. After around the school, children find a trolley and agreed if trolley is the most appropriate to move the entire mineral water boxes quickly and used a little energy.

### 2.5. Post lesson discussion

In the post lesson discussion at second class, we found that:

- First problem who came touch child’s empathy to help others
- But children’s motivation to help being down when they felt tired and difficulty
- The motivation could be improved by did intervention in form of challenge to make the fastest and the simplest way to find a carrier equipment.

- he provision of challenges can be raised children curiosity to prove that their opinion about wheel was right

- .activities that related to the interest of children make a child felt happy and enjoy this observation and experiment voluntarily

We realize that good planning before class activity is very important. The plan is including having a clear purpose or aim; interesting activities choose a proper material and choose the right methods. One more that also should not forget is to choose an activity that is appropriate interest children and close to a child.

## B. CONCLUSION

From the whole set of activities undertaken we draw the conclusion that lesson design made based on the perspective of children will help ease the purpose of learning in class who make more concrete and more contextual to children. An activity that more contextual to children will make a child more easily understood the concept from the teacher, so that a child acquire new knowledge (or strengthening their knowledge previously existing) that can help the child to solve the problems he met.

The description above describing that the lesson study give positive impact on deep reflection owned by teachers and teachers learning capability in designing better.

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**Title: Same C-P-A Approach, Different Practice**  
**Types of Paper: Case study of Practice**  
**Strand: Pedagogies and Teaching Strategies**

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**Abstract:** Lesson Study of 2014 in Brunei Darussalam focuses on Year 1 and Year 4 primary mathematics. At least 12 government schools were selected to practice lesson study as a school based practice and the features of the Lesson Study concentrated on Concrete-Pictorial-Abstract (C-P-A) approach for Year 1 and problem solving for Year 4. It is expected that through C-P-A approach, pupils would have more opportunities to see, experience and link the intended concept through its representation from concrete materials to picture presentation and finally its abstract form. Since January 2014, Brunei primary mathematics teachers from year 1 until year 6 had the opportunity to develop their knowledge and understanding on using C- P-A approach. Based on our lessons observations of three schools selected from the twelve schools, we found that the implementation of C-P-A approach in mathematics lesson was somewhat different despite using the same concept. This study is looking at the variations in the classroom practices in the three different schools. Based on the videotaped lesson observations, it seems that the way the teachers present the mathematical concept from one representation to another and showing its transition between representations may affect the effectiveness of the lesson. The similarities and differences in the classroom practices of C-P-A will be further explored in the study.

**Keywords:** C-P-A; Representations; Lesson Study; Primary Mathematics

## 1 INTRODUCTION

Brunei Darussalam has undergone educational reform under the Ministry of Education Strategic Plan 2007-2011 called National Education System for the 21st Century (SPN21). In the education reform, there is a call towards achieving the mission and goal of SPN 21 which focuses on student centered learning and also creating a fun learning environment for students.

In 2006, a revised curriculum framework and syllabus content showed a recommendation to use concrete materials as an approach to teaching, where it stated In the early

years, concrete materials will help children to develop basic mathematical concept...Concrete experiences provide the foundation for developing and clarifying abstract concepts (Curriculum Development Department, 2006, p.6) In addition to concrete materials, other modes of representation were recommended to be used in mathematics instructional strategies to cater to students learning styles.

One of the approaches to promote student-centred learning, that is the concrete- pictorial-abstract (C-P-A) approach, were recommended to primary mathematics teachers involved in Lesson Study Project. The teachers worked

collaboratively within their schools to plan a lesson using C-P-A as their instructional strategy. From 12 selected schools doing Lesson Study, the research focused on three schools of different background. Based on observation of video recorded lessons of the three schools there were evidence that C-P-A approach was implemented in the classrooms. Despite the similarities in the C-P-A approach, there were still differences in terms of effectiveness of the lesson being carried out, students' engagement during workgroup and also the learning environment itself.

Thus this paper will look at the instructional practices of teachers from three different schools involved in Lesson Study employing the C-P-A approach in teaching operations without regrouping.

#### Concrete-Pictorial-Abstract approach

C-P-A approach is an instructional strategy that has three components, where each representations promote the understanding of an idea or concept. Concrete element include manipulatives, tools or any tangible objects students can grasp during the lesson. Pictorial component include drawings, graphs, diagrams that students produced or given to them in the lesson. Abstract representations include symbols, numbers or letters that students generated to show their understanding of mathematical ideas or given to them to interpret.

The C-P-A approach which is based on the work of Jerome Bruner (Bruner, 1960), is hope to foster an understanding of mathematics through different modes of representations so that students develop conceptual knowledge in addition to acquired procedural knowledge. In addition, the transition that happens in the C-P-A approach enables students to solve problem in a progressive manner starting with concrete then pictorial and finally solving abstract problem. With the presentation of different modes of external representations, students can benefit more to cater to their sensory reception to approach a mathematical concept (Shih, Speer, & Babbitt, 2011). This can also caters to students with learning difficulties as the different stages of representation of a mathematical concept or skill requires different level of cognition (Sousa, 2008).

In order to maximize the learning environment and conceptual understanding in mathematics, the schools involved in lesson study were encouraged to practice C-P-A in teaching mathematics topics particularly for basic operations

which requires manipulative and pictorial representational almost in every introduction of elementary mathematics topics.

#### C-P-A instructional practice

It was important that in order to design an effective C-P-A approach lesson a lot of options need to be considered. From choosing the appropriate concrete materials, to replicating the materials to imageries form and presenting the symbols where students can easily interpret. In order to make sure that the mathematical concepts are clear to the students, the C-P-A approach has to be carried out in an appropriate sequence or stage. The implementation of the three modes has to have smooth transition. This is to make sure the connections between concrete, pictorial and abstract are relatable and easily understood.

Students with different learning styles can benefit from C-P-A approach, but it caters specifically to students with mathematics difficulties. This is because students experience the same mathematical concept in different forms where the concept progressed gradually from concrete manipulative to images form and to abstract symbols (Jordan, Miller, & Mercer, 1998). With C-P-A approach, students are not merely looking for a solution but also exploring the strategies to answer mathematics problem (Sousa, 2008).

The instructional practice of the teachers will be the main factor in the explicit progression of the representations of mathematical ideas. Thus this will be the main focus of this study. What we are expecting to see from the 3 lessons from 3 different schools is how the teachers interpret the C-P-A in their own way. Could the C-P-A be carried out effectively if the pictorial component is not included in the lesson? Could the abstract be taught earlier alongside with the concrete and pictorial? Could the pictorial and abstract stage be introduced together?

## 2 METHODOLOGY

The selected schools are few of the schools involved in 2014 Lesson Study Project. The schools have different background based on their performance in the Primary School National Examination (PSR) where teacher A is considered from top performing school, teacher B from mid-range performing school, and teacher C is considered to be from low performing school. The limitations of this study maybe due to the differences in teachers'

qualifications and experiences in teaching mathematics. The teachers’ background can be found in table 1. our paper will be part of the conference proceedings. Therefore we ask that authors follow the guidelines explained in this example.

In your proceedings paper, don’t use any footnotes or endnotes. When you cite a previously published author, do so in the main body of your

text. Please follow the *APA Publication Manual* (6th edition) style accurately.

Teacher	General Teaching Experience	Mathematics teaching experience	Highest qualification
Teacher A	12 years	7 years	Diploma Primary Education
Teacher B	Almost 10 years	6 years	BA Primaria Education
Teacher C	Almost 10 years	9 months	BA Primaria Education

The students are of mixed abilities. The lessons used in these three lessons looked at the topic of addition and subtraction without regrouping. All three teachers were encouraged to employ C-P-A approach in their instructional practices. Qualitative method was used in this study. The authors used video-recorded lessons and teachers’ lesson plans as the evidence to look into the instructional practices used in this study. For the validity and reliability of the study, three researchers observed the video-recorded lessons separately and cross-checked their observation notes.

## 2.1 Findings

### Teacher A

Teacher A’s topic was on subtraction without regrouping where the lesson objectives were to solve subtraction in word problems and to write mathematical sentences. The representations used in the set induction were concrete and abstract representations. The concrete representation used was a packet of cookies for counting and subtracting. As for the abstract part of the induction, the concept shown using the cookies was translated to mathematical sentences written on

the whiteboard. [to enable pupils to make reference based on the demonstration of counting the total number of the cookies available, taken and remained].

The development stage of the lesson emphasized more on the abstract representation of the subtraction concept. These were word problem, mathematical subtraction sentences, number bond and timeline. These were projected on whiteboard. The word problem was presented in simple sentences. Then the concept presented was translated to pictures depicting the word problem. The subtraction concept during the pictorial stage was explained briefly by showing a movement of images being taken away (disappearing from the screen). The mathematical sentence then shown to answer the problem. Finally for the number bond and timeline were shown consecutively as an additional method in solving the word problem.

For students’ group activities, each group was given a word problem to solve where counters were provided for students to use to aid them in solving the word problem. Although counters were provided, the video recordings showed that the students did not use it and instead draw the images used in the word problem instead. Then with the images, students wrote the mathematical sentence. In this activity, only abstract and pictorial representation was used. As for the presentation,

the sequence was similar to the activities stage. A presentation of the work was explained in front of peers.

### Teacher B

Topic by teacher B was on addition 2-digit by 2-digit numbers without regrouping. Lesson objectives were to add 2-digit number with 2-digit number without regrouping and add correctly using the column method.

The initial part of the lesson was carried out with an addition of 2-digit by 2-digit through video presentation. Questioning and answering session were carried out after the video session. The presentation of the addition of 2-digit by 2-digit was further explained through the base ten charts or known as the column method chart in which the ones and tens place values were highlighted.

During the developmental stage, abstract representational was repeatedly carried out. The abstract representational also took place during the representation of pictorial and concrete. It showed that during the development stage reliance on abstract was more than on pictorial and concrete. As for the pictorial part of the developmental stage the lesson focused on images of 10-based of ones and tens and followed by the usage of column method. Discussion was carried out during the presentational of the images. The development stage was further explained briefly through the use of 10-based blocks (concrete) in column method sheet and more instruction was directed in asking of numbers and symbols in solving the questions presented.

During the activity stage, a set of 2-digit by 2-digit addition flashcard was distributed to each group. There were two activities carried out during the group work. First activity required the used of addition without regrouping in symbols and for the second activity involved the usage of 10-based blocks which were pasted on a column sheet in which was a representational from the first activity. As for the presentation stage, explanations of the tasks by the pupils were similar of how the activity was carried out during the group work activity.

### Teacher C

Teacher C was doing addition of 2-digit without regrouping using based ten blocks. Lesson objective as specifically to add ones and tens without regrouping using base10 blocks.

The lesson started with an abstract. Then the abstract was supported through the usage of concrete. Based 10 blocks were used as the concrete manipulative. The transition from the abstract to concrete was carried out repeatedly throughout the set induction. The place values and the values of the based 10 blocks were also highlighted during the set induction.

The development and activities were carried out in concurrently in which involved the transition from abstract to concrete to pictorial and finally into abstract. The first group activity which was carried out in the developmental stage was the transition of abstract to concrete and later back to abstract. The first group activity which was on addition of 2-digit by 2-digit was presented in addition mathematical sentence.

Then a transition occurred in which this addition mathematical sentence was then presented into concrete on a column method sheet. It was then rewritten into abstract. A brief explanation and comparison of the work done on transition was highlighted before proceeding to the second group activity.

For the second group activity, the concrete was translated into pictorial and finally into abstract. In which the presentation of the 10-based pictorial was drawn similar to that of the concrete whether it was the 10-blocks which represents as tens or ones. The pictorial were later presented into abstract. A demonstration of the transition was highlighted during the group discussion before the pupils are allowed to proceed to demonstrate the pictorial session so that there was real evidence of such transition of the concrete to pictorial happening in real time.

For the presentation, the work done during the second activity was further shown on the white screen and discussed. The images representation from the concrete was highlighted and further discussion was carried out and finally feedbacks were gathered before worksheets were given.

Teacher	Introduction/ Set	Development	Activities	Presentation
A	$C \rightarrow A$	$A \rightarrow P \rightarrow A \rightarrow A$ $\rightarrow$ $A$	$A \rightarrow P \rightarrow$ $A$	$A \rightarrow P \rightarrow A$
B	A	$P \rightarrow A / P \rightarrow A /$ $A /$ $A \rightarrow$	$A \rightarrow C \rightarrow$ $A$	$A \rightarrow C \rightarrow A$
C	$A \rightarrow C \rightarrow$ $A$	$A \rightarrow C \rightarrow A$ & $A \rightarrow P \rightarrow A$		$A \rightarrow P \rightarrow A$

Table 2: Sequence and transition in lesson development using C-P-A

\*C – concrete, P – pictorial, A - abstract

### 3 DISCUSSION

From teachers' lesson plans, all teachers sequenced their lesson based on standard division of classroom activity where it started with set induction section, development section where the activities were done mostly by the teacher, then the guided practice

activities where students work in groups with the peers, and then students present their group work to the class. After reviewing all the lessons on operations without regrouping, all three teachers used multiple modes of representations in their teaching namely concrete, pictorial and abstract components. However from the summary of the C-P-A modes in their lessons, each teacher has different representational sequence and the role of the representations, especially concrete materials, was used differently in their classroom activities.

#### 3.1 Representational Sequence

From table 2, all three lessons showed that multiple representations were present and the most prevalent mode of representations is abstract representation. However, the representations pattern that is the combinations of concrete, pictorial and abstract differs. The use of multiple representations provide students with different types of external representation system that can each can help students to grasp the mathematical concepts. Not only each mode of representations are important, but the sequence that provide the translations among the representations and transformations within the representation also need to be considered (Lesh, Post and Behr, 1987).

In terms of translations among the representations, only teacher C had explicitly done this when she combined the representations in the development and activity tasks. As Hall (1998) has emphasized, teachers typically led students to manipulate the materials quickly to echo the standard algorithms. Teacher C done this in her lesson but she combined this with the pictorial representations after the manipulations of the materials. Thus the translations were made clear for the students.

When the sequence of the representations in table 2 is to be further summarized and generalized, teacher A would have C-A-P-A, teacher B would have A-P-A-C-A and teacher C would have A-C-A-P-A sequence. All teachers end their lessons with the abstract representations but started differently. While both teacher A and teacher C had similar sequence, teacher B had a different order where pictorial came before concrete. The reason for teachers different sequence can be discussed further in relations to the role of concrete materials used.

#### 3.2 Role of concrete representations

Authors discovered that teachers used concrete representations differently in their lessons. For Teacher A, the concrete materials were used at the beginning of the lesson to demonstrate the concept of counting and subtraction. Although concrete counters were provided during group work, but students did not use it and teacher did not emphasise on the use of counters to aid students' thinking. Teacher B utilized concrete materials, namely base-10 blocks, in the lesson for students to explain their

thinking and not to aid them in thinking. This can be seen during group work where students found the answer to the problem and then try to show the answer using the base-10 blocks. Students used the concrete materials to show their procedural standard algorithm. Hence, teacher B was the only one who has A-C-A sequence towards the end of the lesson instead at the beginning of the lesson.

Among the three lessons, teacher C demonstrated full use of the concrete materials, namely the base-10 blocks, to aid students in conceptualizing addition concepts. This is because from the lesson, teacher C incorporated the materials from set induction until guided practice group work activities; and presented the materials where the objective is to aid students to 'see' addition and utilize the materials to aid the students computation and thinking. All three lessons however had used concrete materials corresponding to the abstract algorithm procedure (Bruner, 1966) but with different degree of transitional clarity between the two.

#### 4 CONCLUSION

This paper on able to study the nature of teachers implementation of C-P-A in these lessons where it seems to depend on the how they see the roles of the representations in the instructional practices. Perhaps our findings can be further strengthened with the analysis of students' work and interviewing the teachers to investigate their beliefs on the use of C-P-A in the lessons. However, we believe that by exploring the sequence and transition of C-P-A in classroom lessons, it provides a window into teachers instructional practice and its impact on their students learning.

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## Using Online Tool “Popplet” to Teach Primary 5 Chinese Composition Writing

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**Abstract:** The dominant language of Singapore’s education system is English. This resulted in many pupils to be weaker in the command of Chinese language, especially in the area of composition writing. Hence, a group of Chinese Language teachers in our school embarked on a lesson study project to explore ways to improve pupils’ writing skills - the effective way of using descriptive phrases to enhance the quality of their composition. We decided to leverage on online information and communication technologies (ICT) tool “Popplet” to help pupils create their own set of good phrases. Pupils were divided into groups and instructed to do their homework of researching on good phrases before the lesson. They worked together as a group to combine their research on the “Popplet” platform. Peer evaluation took place through the “Popplet” platform. There were clarifications and discussions among group members on the suitability of phrases chosen and thus in-depth understanding of the application of good phrases among pupils was achieved. At the end of the lesson, teachers compiled pupils’ works into printed notes for pupils’ ease of reference in future. Since these notes are primarily inputs from pupils, pupils also felt a sense of ownership and therefore have a higher tendency to put them to use. Indeed, the Pre- and Post-Lesson study results showed a significant increase in the usage of the phrases in composition writing. From the cycle of lesson study, teachers found that the “popplet” platform has facilitated self-directed learning, group work and peer evaluation.

**Keywords:** ICT-based lesson, Popplet, group work, self-directed learning, peer evaluation, composition writing

### I INTRODUCTION

In order to improve our pupils’ standard of Chinese language, there is a need to come up with a pragmatic way of teaching.

As English is the dominant language in Singapore’s learning environment, many pupils lack the language skill to write a good composition. Teachers had long noticed that among the Higher Ability (HA) pupils, their compositions are in general quite adequate in content but lack in the area where the description of “emotions” is concerned. As a result, pupils’ compositions, though grammatically correct, are dull in content.

Therefore, in order to improve our pupils’ Chinese composition writing standards, we conducted this Lesson Study with the hope of improving their writing skills. By using ICT as our teaching tool, we also hope to arouse pupils’ interest in learning the Chinese language and enhance effectiveness of our teaching.

### 2 LITERATURE REVIEW

ICT is an integral part of our modern living. It also plays an important role in enhancing pupils’ learning and improving educational outcomes (Buang, 2011). According to Kumar (2011), in keeping with the changing needs and characteristics of learners of today, there is a call for greater use of ICT for Mother Tongue Language (MTL) learning. Hence, our first thought about improving pupils’ Chinese writing standards was through the use of ICT. We strongly believe that through the effective use of ICT, our pupils will also develop competencies for self-directed and collaborative learning (Buang, 2011).

“Popplet” was chosen as the ICT tool for this lesson study for 2 simple reasons – it is a free resource and very user-friendly. Positive reviews on “Popplet” like “the interface is simple to use” and “viewing finished Popplets is also very straightforward. A single mouse click allows users to zoom in on an area of the graphic they’d like to examine in more detail.” further convinced us that



this Popplet is a suitable tool to be used our lesson study.

### 3 THE PROCESS OF LESSON STUDY

Teachers identified the target group to be the Primary 5 High Ability (HA) pupils. Pupils from the 2 classes chosen were somewhat similar in terms of their Chinese proficiency. With that in mind, we assumed the adjustments made to the subsequent lesson plans would be minimal in terms of difficulty level of materials and task designed.

#### 3.1 First Discussion – Structure of the Lesson

During our first discussion, teachers decided on teaching pupils to use good quotes and phrases to describe “emotions” in their composition writing.

Given the widespread use of computers nowadays, teachers decided to integrate online ICT tool “Popplet” to teach composition writing. One advantage of “Popplet” is that pupils are able to see their peers’ work and give comments without the restrictions posed by time and space. As most of these pupils have prior knowledge of computers and the Chinese input system, teachers only need to briefly introduce the use of “Popplet” and teach them how to set up a Popplet account. Prior assignment given to pupils was to do a research on good quotes and phrases to be used for Chinese composition writing after school hours.

As a measurement of the effectiveness of our teaching, teachers also suggested letting the pupils write a picture composition as a pre-test, and use the same picture composition as a post-test to determine whether there is an increase in the usage of good quotes and phrases after their “Popplet” lesson.

#### 3.2 First Lesson and Post-Lesson Suggestions

Prior to the first lesson, pupils were already taught on the usage of “Popplet” and the setting up of personal account on “Popplet”. When the first lesson was conducted, teachers observed that most pupils were familiar with the functions of “Popplet” but the majority was not able to complete the task given as they did not do a prior research on good quotes and phrases as required by the teacher. Some pupils had either forgotten what they had researched on or were not very proficient in the Chinese input system (as the teachers thought they would be) and hence resulted in delay in completing the task.

Nonetheless, pupils were mostly engaged in learning. The air-conditioned computer laboratory where the group work took place created a conducive

environment for learning. The group reward system implemented by the teacher also helped to encourage individual groups to produce better quality work.

Teachers who observed the lesson study suggested allowing the pupils to bring their notes of prior research for reference during “Popplet” time, with the hope that it would help the pupils to complete the task within the time frame.

Teachers also observed that pupils faced difficulty in completing the task as there were too many “emotions” to describe in just one picture assigned to them. (see Figure 1) Hence, one may have to spend more time in choosing the appropriate and good phrases for the different emotions like “sadness” and “fear” present in one picture. Pupils were either taking too much time to analyse the many “emotions” of the pictures or thinking about what to write. Some were simply confused. Teachers suggested letting each group concentrate on describing the same “emotion”.

Figure 1:



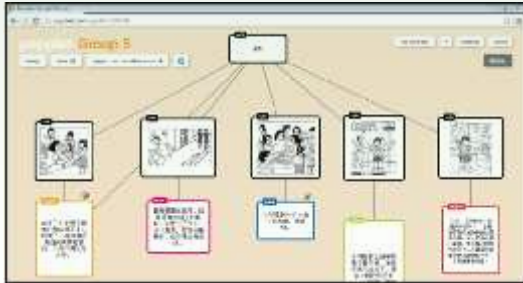
As for peer evaluation, teachers noticed that pupils’ comments were very similar. Thus, teachers concluded that pupils did not have the skill to give constructive comments. Teachers felt that pupils should be advised that simple comments like “appropriate use” and “used incorrectly” are sufficient. Nonetheless, the pupils of higher proficiency in Chinese may add in personal comments if they wish to.

#### 3.3 Second Lesson – Re-design, Re-teach and Reflect

The refinement to the second lesson plan focused on allowing each group to describe one “emotion” only (See Figure 2). There was healthy competition amongst the members of the same group as they were competing against one another to come up with the better phrases to describe the specific “emotion” assigned to their group. Pupils were able to complete their task within the time frame and so there was ample time allowance for peer evaluation. This approach seemed more

practical as pupils had more time to do critical thinking.

Figure 2:



As for peer evaluation, there were circumstances whereby the pupils were able to pinpoint what their peers had put on on “Popplet” were inappropriate or incorrect, but were unable to explain in speech. Teacher concluded that it would be better if pupils were to be provided a simple evaluation checklist as reference when commenting on their group members’ work (NCLRC, 2004).

#### 4 THE OUTCOME OF THE LESSON STUDY

After the lesson on using “Popplet” to learn Chinese composition writing, teachers conducted a post-test by asking the pupils to write a picture composition. As mentioned earlier, pupils wrote a composition using the same material prior to the lesson study.

The following data were collected:

	Cycle 2	Cycle 1
Class (No. of Pupils)	5-1 (34)	5-3 (35)
Improvement (More usage of good quotes and phrases)	22 64.7%	27 77.1%
Regression (Less usage of good quotes and phrases)	1 2.9%	3 8.6%
No Change (in the number of good quotes and phrases used)	9 26.5%	4 11.4%
Did not use good quotes and phrases before and after	2 5.9%	1 2.9%

\*Note: Class 5-1 has higher mark range for Chinese than Class 5-3

Based on data collected, pupils did try to use the good quotes and phrases which they have learnt during the course of the lesson study. In fact, we see

encouraging results of 64.7% and 77.1% from class 5-1 and 5-3 respectively. More pupils used more good quotes and phrases for their composition writing. We believe the increase was more significant in Class 5-3 because Class 5-3 is a weaker class (compared with Class 5-1) to start with and hence the “Popplet” lesson benefitted Class 5-3 the most.

Teachers believe that although the traditional way of classroom teaching may also allow the pupils to learn more good quotes and phrases, the effective integration of computer technology does enhance the pupils’ interest in learning. Use of online tools like “Popplet” allows quick interaction among teachers and pupils, which is not quite possible in a typical classroom setting.

Having said that, ICT in our opinion, is a secondary tool when learning is concerned. We believe effective learning is still largely dependent on the learners’ attitude and mentality. In our opinion, we should use ICT liberally, but not have the mentality that it is the only way to solve all problems relating to language learning.

It is through this lesson study that teachers discovered the majority of pupils though they were HA pupils, they were rather weak in word recognition, resulting in them selecting the wrong Chinese characters when typing. Hence, teachers may choose to work on this area for their next year’s lesson study.

#### 5 CONCLUSION

Lesson study is an effective method to improve our teaching. After the several rounds of trial teaching, we gradually perfected the lesson plan and implemented it in our actual teaching, and have achieved the desired teaching outcomes. Teachers also gained expertise, pedagogically speaking. In conclusion, we should continue with Lesson Study as it helps in improving teachers’ teaching skills and brings about effective learning for both teachers and pupils.

#### 6 ACKNOWLEDGEMENTS

We wish to thank our school leaders, Mdm Christina Teo and Mr Jeffrey Aw, for providing us with the support and guidance to make this lesson study a successful one. We also thank our School Staff Developer Mdm Lau Kai Yen for sitting in our meetings and rendering her help towards the editing of this paper.

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## Improving The Quality of Thematic Scientific Learning Based on Soft Skill Through Lesson Study in Elementary School

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**Abstract:** Implementation curriculum 2013 in elementary school required The integrative thematic scientific Learning. Its new things problem for the elementary school teacher's, to meet the requirements the teaching models will be taken through the lesson study with optimalization in soft skill for the teacher and students. The purpose of this articles are: (1) to descript thematic scientific learning in elementary school; (2) to identify the obstacles in application of thematic scientific learning in elementary school; (3) to formulate the thematic scientific learning in elementary school concept models based on soft skill using the lesson study. In planning thematic scientific learning in elementary school; the teacher will communicate and cooperate with their college to analyze the competence standard, theme, indicator, determine the objective and the learning content, equipment, the instrument for evaluation. The step of learning will covered such as: observing, asking, trying, analyzing, and to communicate the materials, and the end using authentic evaluation for evaluate the learning process. The end of learning process the teacher will provide the conclusion and give the test for the student. And also give analysis for the learning process as a input for the next learning process.

**Keywords:** Quality, Thematic Scientific, Soft Skills, Lesson Study, Elementary School

### 1 INTRODUCTION

Improving the quality of learning curriculum 2013 in elementary school need to be done in a systematic and comprehensive with a range of creative and innovative efforts. The learning process with thematic and scientific approach as new things important to developed through research activities, lesson study or discussion of perceived learning so that students are really meaningful and fun.

The improvement integrated scientific learning in curriculum 2013 implementation with the purpose the student able to understand live comprehenship live problem, the tintegrated scientific learning should be ltaught since childhood, so the student already familiar using scientific approach and they ableusing analytical thinking and high proficient. The scientific attitude able be performed through the learning scientific process, the scientific learning process consist of observing, asking, experimenting, analyzing and communicating. In the thematic scientific learning process the planning should embedded the quality soft skill. As Krueger said (2007:23) soft skill is also as fundamental skill ( ability to good work; manage the information; able to solve the problem), thesoft skill also has meaning in intrapersonal skill ( belief in his/her self and ability to manage his/her self); soft skill also as interpersonal skill ( social awareness and able conducting a good

communication), all of be mentioned above should be adapted by the people for improvement.

For handling the future challenge the student have to be taught the soft skill. Because the soft skill is essential ability for human life, especially to face the 21<sup>st</sup> century. With the good soft skill, student able to entrance the competition of life. The method in soft skill learning process many various, such as: the soft skill able be improved through the school culture, inclusive in the learning process and also through the extra curricular activities. In line with the (Koswara, 2001; Puliam, 2008:2, Pai, 2008:168-17, Utaminingsih, 2011). The improvement of soft skill in learning process especially for increasing the quality of the result of learning and increasing the competitive human resources.

The orientation of curriculum year 2013 to make balance between *hard skill* dan *soft skill*. *Soft skill* should be thaugt since childhood through thematic scientific learning process, starting the elementary school as the fundament to entrance in real life. Starting the childhood, student to use critical thinking, problem solve, able to communicate with other people and make cooperation. For have good attitude the learning process also need to adopt the good norm and local value as they character. The local culture need to be adopted in planning the thematic scientific learning.

The thematic scientific learning, the student able to formulate the problem, when they have a problem

they will active to find some information through asking the question for gathering more information, when they have felt enough with the information, the able to make the information usefull for analytical process, using the analytical process student able to find some alternative in solve the problem, they able to choose the best alternative, the best alternative will be applied in experimenting in solving the problem. The experimenting wil inform if the good alternative already be choosen for solve the problem. Finally the result will be disseminate as communicating the result of learning. The thematic scientific learning as learning system that will give the individual or group active in digging the knowledge concept and principle in holistic way, meaningfull and authentic (Rusman, 2011:254).

Thematic learning scientific problems in the curriculum of 2013 is new for teachers and elementary school students. Then it needs to be an increase in the quality of learning by optimizing the soft skill of teachers and students, as well as conducting lesson study collaboratively. Lesson study is done to improve teacher professional competency through a system of activities that enhance the professionalism of teachers and koegalitas with the philosophy of the great expectations placed on students (Masaki Sato, 2014: 2).

According the crucial need The thematic scientific learning so the problem for this article be formulated as: 1) How The thematic scientific learning in elementary scholl ?; 2) What is the challenge of thematic scientific learning ?; 3) How the best model of thematic scientific learning based on soft skill using the Lesson study methods?

## 2 METHODS

The methods of this study is R & D that is already developed by Bord and Gall, (1998), for the paradigm of the research is Qualitative. The locus of this research in 4 elementary school in Kudus Regency, the 4 elementary are: SD I Jati Wetan, SD II Jati Wetan, SD I Purwasari (as a public scholl) and SD I Muhammadiyah Kudus (as private school). SD I Jati Wetan hav been executing curriculum 2013 allready 2 years and the rst starting using curriculum2013 start year 2014 . The object of this research is grade IV. The Focus of this research is The thematic scientific learning process in elementary school. The finding will be used to formulate the model thematic scientific learning based on soft skill through lesson study

The technique of the data collection using as follows: in depth interview, observation, forum group discussion, and study documentation. An instrument for this research is the researcher, because the best instrument for qualitative paradigm is the researcher.

The data will be analyzed using triangulation methods, in triangulation methods the analyze of the data can be done together with the collecting data.

## 3 RESEARCH FINDINGS

The elementary school that has been implied by 2013 2013 curriculum implementation in the scientific approach to learning is better, than the new elementary school beginning in 2014. Applying the scientific approach is understood by all teachers class IV that in learning to use the scientific activities to observe, ask yourself, try, others are allegorical; and communicate. Teachers understand the learning process using this scientific approach is intended to give insight to the learners know, understand the various materials using a scientific approach. Information can come from anywhere, at any time, do not rely on direct information from teachers. Therefore the expected learning conditions are created to encourage learners are directed to find out from various sources of observation, not informed. Just the fact of understanding and application of very different, many teachers find impelemntasi in problems both in the ability of the teacher amupun students as well as learning material.

The elementary school in which already implementing The thematic scientific learning starting 2013 felt the learning process is better, than before the had not applied it. The implementation have been understand by all teacher for grade 4, they have already using observing, asking, experimenting, analyzing and communicating in teaching for the student.

The process using thematic scientific learning as the approached, some student already active and doing process of scientific approach, the process of learning more better, more joyfull and more meaningfull .

The research results showed that 76% of teachers have done learning the process of observation. In the activity observed, making every effort to facilitate teachers to observe it well, teachers already using either media images as well as real goods, only lectures are still dominant in learning. In the process of learning, observing, learning activities students are told to read the readings on the student book, hear and listen to explanations teacher, view pictures or media objects prepared teachers. The disadvantage, observations of students not yet systematic, process of communication and problem-solving are still a bit. Students secaris outline view only for a moment, but pengamtan a scientific process after seeing, hearing should be eliciting responses and high level thinking processes such as analysis or reasoning

In inquiring into the activities, the ability of teachers to facilitate the improved still need to ask

yourself in a learning activity ask yourself the teacher has done, in one study on apersepsi activity of an average of 3 times the teachers ask the students one time and ask. In the core activities of the teacher asking an average of 8 times and students asked 3 times but uneven. Students who ask still dominated by certain children. Ask not to be that is not understood, it could also be understood but need to be asked in order to achieve a high level of thinking process creates or creative. Ideally the question starts from the question to the factual question hipotetik.

The activity of trying or mengumpulkan information, teachers create groups to discuss competencies achieved, working on the LAS (student activity sheets). There are teachers who still wear the old model'S LAS/LKS. One school or class management discussion process is better than the other two schools. Most of their learning activities still reading other sources in addition to textbooks and observe objects/events/activities in collecting information

Others are allegorical; in the activities carried out at the time of the discussions or working on LAS/LKS teachers hope the others are allegorical; can be maximum. Activities in a presentation or communicate, in one study an average of 2 times the teachers facilitate communicate or present. Each learning yet all children get the chance to present the results of the discussion or LAS menegrjakan/LKS. The dominance of certain children are still visible. It addresses the factors also affect the success of the students indiidu the implementation of the curriculum of 2013.

The obstacles in implementing scientific approach such as : (1) The limitation of materials, teachers, student. Some times the teahers hesitate what they have to do, but after a few minutes the teachers able to manage the activities; (2) Every sub theme and one class have to prepare one copy of material; (3) The thematic scientific learning is a new one for the teacher so sometimes they have to accelerate it in practical; (4) The limitation of materials ; (5) The application of authential evaluation to many requirement to be met, an all aspect such as cognitive, affective and phsycomotorisc.

The active learning process enjoyable and scientifically on thematic learning is new to all the teachers in the primary research. They seek to understand and implement the curriculum make the 2013. Although many teachers who complain still provide support by applying the learning. On the learning process of teachers is still focused on the application of scientific approaches, not to develop models of learning.

#### **4 THEMATIC SCIENTIFIC LEARNING IMPROVEMENT BASED ON SOFT SKILL**

To improve the quality of learning in a scientific approach to megoptimalkan ability soft skill students and teachers, including the ability to communicate, collaborate and solve problems. Students essentially have the ability to speak or communicate. Observations showed the ability to communicate, ability to ask, not possessed by all students.

The ability of scientific cooperation in the thematic learning can be realized by applying various models of learning. A study on an active, creative, fun can be created through the use of varied learning models and innovative as well as in tune with the characteristics of the students. One of them with a learning cooperative. Sanjaya (2011: 244) posited different cooperative learning with other learning strategies. The difference can be seen from the learning process that emphasizes the process of cooperation within the group, so as to enhance learning activities. Objectives to be achieved are not just academic ability in the sense of mastery learning materials, but also an element of cooperation for the control of such material. The existence of a partnership that became the hallmark of cooperative learning.

Problem-solving abilities students will also need to be trained continuously through thematic scientific learning. In activities observing the students could be trained further activity of problem solving, students are given questions or inquiring into the issues related to the ordered, students try to solve the problem, others are allegorical; a problem and communicate the results breakdown for nurturing Cedar [to be the activities that can enhance the ability of the soft skills of students

#### **5 LESSON STUDY BASED ON SOFT SKILL**

Improved quality of learning that applying the scientific approach needs to be done with lesson study by utilizing the kolaboratur classroom teacher, student internships, supervisor, principal or parents of students. Lesson Study based soft skill is learning activities beginning with the learning plan (Plan) by teachers with engaging collaborators. Further implement the learning process (Do) with the approach of the scientific, thematic and liveliness of the stressed students to communicate, collaborate and solve problems. After the completed reflections/sharing (See) with the aim of improving the quality of learning.

The study focused on forming students' ability to communicate, collaborate and solve problems so collaborative learning in learning will be created in school classrooms;. This will form the next lesson study-based collaborative learning because it's all students will communicate with each other, teachers and collaborators. (Ali Mustadi, 2013). There will be an intensive communications students with students, students with teacher, teacher with teacher, so that collaborators would be created between the learning community. (Masaki Sato, 2013).

The involvement of numerous collaborators each had advantages and disadvantages. Classroom teacher collaborators, problems that arise who taught the class abandonment? The benefits of teachers know the weaknesses and strengths of teaching colleague friend so it can be used to improve learning is doing. The principal collaborators, his infirmities when principals do not understand the scientific approach or learning curriculum 2013, its teachers don't feel grogi because already understand the principal.

Collaborators can pair together, together have a disadvantage because the students concentrate in school classrooms; a lot of people who were observed. Collaborators observe, communicate and cooperate with the teacher model since the teachers make the learning plan which specifies the methods, models, media, classroom settings, preparation of assessment instruments. So when in learning collaborators already understand the RPP (lesson Planning) and the learning process, so the collaborators will be able to provide corrections, suggestions and development learning teachers model using a thematic approach by optimizing the scientific ability students to communicate, collaborate and problem solving. Collaborators observed the start of activities apersepsi, core activity and closing activities. The observations focused on the activity of teacher and student activity. After the completed reflections through the FGD. The reflection result is being made as the basis to arrange continous enhancement in order to improve learning quality of 2013's curriculum.

## 6 CONCLUSION

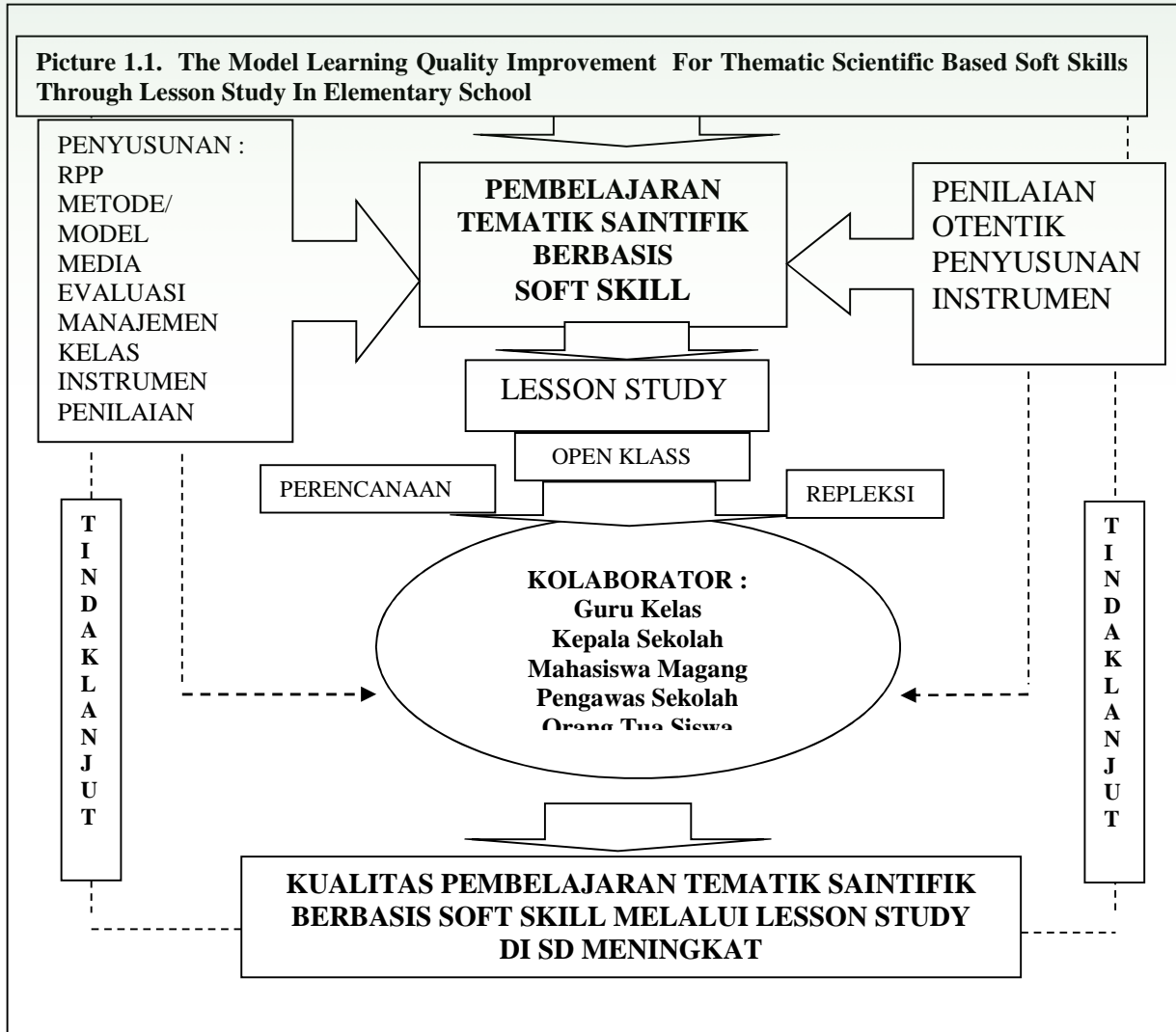
Implementation scientific curriculum thematic approach to 2013 by optimizing the ability of pupils to communicate, collaborate and solve problems on individual learning activities in observing, asking questions, trying, others are allegorical;, and communicating. This learning can be improved by doing continuous improvement through lesson study based soft skill both in planning, implementation/open class and reflection of learning curriculum 2013 could rise.

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**APPENDIX**



## Communication in Teaching and Learning Mathematics Among Students in Rural Area

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**Abstract:** This study was conducted to observe the communication in teaching and learning mathematics in delivering new topic to the pupils of 11 years old in rural area. The study focussed on 3 aspects which are : (1) to indenfy pupils understanding through communication in the classroom; (2) to identify types of communication in learning mathematics that can be enhanced mathematical understanding; and (3) to identify pupils perception of communication in teaching and learning mathematics. Teaching and learning began with set induction conducted by the teacher to make known to pupils what they are going to learn then, pupils were given a worksheet each and they were required to answer the questions in the worksheet individually in 20 minutes. This was followed with a group discussion on the solution. An interview session with the pupils was carried out to acquire pupils’ reaction on the teaching and learning process. Pupils were also answering questionnaires. In addition, field notes were recorded to complement the findings. The findings showed that the pupils were able to carry out the lesson and understand the needs of the questions given. A group discussion was the most used of communication in the classroom.

**Keywords:** communication, understanding

### 1 INTRODUCTION

The aim of the study was to obtain the perceptions of primary school pupils regarding communication in teaching and learning mathematics. The study was carried out in two primary schools in rural areas namely Balik Pulau and Berastagi. The pupils involved in this study were from 11 years old pupils. This quantitative and qualitative study required pupils to answer the questions given by the teacher. But first, the teacher explained the objectives of the lesson before the questions was given to the pupils. Hence, the research questions were as followed :

Was the pupils understand the questions asked by carrying out communication in their classroom, what types of communication in learning mathematics that can be enhanced mathematical understanding and what are the pupils’ perception of communication in teaching and learning mathematics?

### 2 RESULT AND DISCUSSION

The findings of this study were discussed according to : (1) to indenfy pupils understanding through communication in the classroom; (2) to identify types of communication in learning mathematics that can be enhanced mathematical understanding; and (3) to identify pupils perception of communication in teaching and learning mathematics.

#### 2.1 Pupils Undertsanding Through Communication

From the study pupils were first need to answer the questions given individually then after 20 minutes pupils were allowed to discuss the answer with their friends within their group. From the result, pupils were not be able to get the answer correctly at the first time because they were not confident with their ability to

answer correctly, they were lack of encouragements from their friends and teacher since the questions need to be answered alone and they were not creative enough in delivering their answer and understand the question needs. When pupils were in the group discussion, they became different in the way they talk, act and react to the questions given. They were confident to argue with their friends about the problems occurred in the questions. When the arguing happened, automatically their mind were generated to respon to their friends and here comes the creativity in finding the answer together and understanding the question needs. Pupils were motivated by their friends and therefore, they were confident and brave to step in front and asked the teacher about questions in order for them to understand better. Zulkardi R. & Ilma stated that learning should not be initiated with a formal system whereby a teacher directly teach a certain topic. This means that teachers need to be able to employed different method or approaches in their instructions to enable pupils to have deep understanding on the concept taught and one of the method, was carried out in this study.

## 2.2 Type of communication and mathematical understanding

Teaching and learning through teacher-cenerd approach is not much of a help for pupils in rual area seemed they will not be able to have a deep undertanding of the concept taught. However, this study was conducted to show that pupils-centered as group discussion were one of the teaching approaches that can be used to enhance pupils understanding. When pupils were in their group discussion, they were actively asked the teacher about the questions and as a teacher, the role is not only providing an answer but infact asking them back so that they will manipulate the question thrown by the teacher and get back to the real problems they were facing. According to Sanders N.M., the way the teacher questioned their pupils can help to direct pupils' thoughts and at the same time will help the pupils to have more interactions with the teacher and also within their group discussion. For this study, type of communication that were able to enhance pupils' understanding is group discussion which involve writing, visualising and arguing. This communication type was also mentioned in Malaysia's Curriculum Specification.

## 2.3 Pupils perception of communication in teaching and learning mathematics

In this section, pupils were asked about their perception of communication in teaching and learning mathematics. Pupils were given a set of questionnaire.

100% of the pupils chose learning in a group than learning by themselves. All the pupils were also said that they were happy when learning in a group and they were able to understand better.

## 3 CONCLUSIONS

To conclude, majority of pupils were observed to agreed that communication in tecahing and learning mathematics is important to enchance pupils' understanding, to encourage pupils to be more confident in expressing their thoughts and also pupils were able to understand better about the question needs.

## 4 ACKNOWLEDGEMENTS

I would like to express my gratitude towards my supervisor, Dr. Faizal Nizam Lee for his guidance and support in completing this project. I also would like to thanks Prof. Madya Jamaludin Md. Ali for his moral support to keep me going and same goes to my families. My thanks and appreciations also go to the pupils and teachers in North Sumatra's primary school and Balik Pulau's primary school for their kind co-operation and encouragement which help me in my project.

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## EFFECTIVENESS OF WHOLE WORD READING APPROACH FOR STUDENT WITH LEARNING DISABILITIES

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**Abstract:** Your abstract should be one paragraph summarizing the content of the paper and should consist of more or less 250 words. Please use Times New Roman of 9-point font size, justify, and have a hanging indent of 2-centimeter. Students with learning disabilities encounter a variety of academic difficulties, one of them is reading. Therefore, they must receive special educational services with effective approach. The purpose of this study was to determine the effectiveness of whole word approach for student with specific learning disabilities who has reading difficulty. The approach used in this study was a single-subject research by taking subject student who has specific learning disabilities. Data collection methods used are interviews, documentation and informal tests. Data were analyzed by descriptive statistics and content analysis. In the baseline phase consisted of 3 sessions and 5 intervention sessions. The results of the baseline phase ( A ) by using the data obtained misspelled the average reading ability of 8.33 and average ability at the time of the intervention ( B ) 21.2 . Both the data A and B declared stable and level ability in phase A parallel ( no change ) while the phase ( B ) there is an increase ( 8 ). Therefore, whole word approach is effective for improving reading ability of student with learning disabilities. Significant findings will be discussed.

**Keywords:** Children with learning disabilities, whole word reading approach

### 1 INTRODUCTION

The research was motivated by 2 main reasons, which are: **first:** the existence of children with learning disabilities (AKB) particularly on studying reading in regular school. They are recognized by their friends and teachers as slow learner because of lack of their achievement. Some profiles of children with learning disability are caused by some internal and external condition. There are some findings of research showing the variety of children with learning disabilities. In 2002, Pujaningsih et al. found that there are 36% children with learning disabilities in Berbah District with the detail: 12% slow learner, 16% learning disability and 17% mentally retarded. Marlina (2006) found 55 children with specific learning disabilities in Padang. Specifically, reading difficulty is 10%-20% found in students of elementary school (Gorman C in Time Magazine on 31 August 2003). **Second:** the complex impact of learning disability. Children with learning disability (AKB) including reading difficulty often get failure in describing their self concept, negative emotional

and personality development (Lackaye and Margalit, 2006). If the failure is not immediately overcome, it will evolve to be kind of depression (Maag & Reid, 2006).

Reading skill is being a main focus indicating mastery of other subjects. Problems of reading skill of children frequently are related on lack of mastery of other subjects. Story-based question in mathematics, some written instructions in evaluation test, supporting reading material of other subjects (religion, citizenship, science, etc) need reading skill. The inability of reading on children must be taken care of seriously.

The research focused on children with specific learning disability in one of Elementary School in Yogyakarta. The inability of students in recognizing letter gives problem to teacher to give other subjects. Suitable method development of learning for children can prevent them to the accumulation of problems in the following level. The finding of the research can be an input for teacher to conduct remedial learning to children with learning disabilities in the class.

Some learning method on reading are developed for elementary students yet still the unsuccessful students are found failed in mastering reading skills with some existing methods because it does not meet their needs. Accordingly, the research wants to examine global method as the result of needs of children with specific learning disability by comparing with the previous method applied by teacher in remedial class. Teacher applies method in which student has to read by syllable in 4 months yet it has not showed the satisfying result.

## 2. Children with learning disability

Terrell (Smith. 1998) believes that the problem of reading on children give impacts on their low level of learning as well. Language problems are frequently related with difficulty in understanding other people, speaking clearly, choosing suitable words to bring up ideas and finding it hard to construct language to communicate effectively (Smith, 1998; Harwell, 2001:36). Reading difficulty in the early stage will complicate the advance level of language lesson, e.g: reading comprehension, sentence structure, and writing skill, if it is not taken care of immediately. The other difficulties they will possess are when they are trying to communicate to others. Being understandable in conveying the ideas and understanding people talk are uneasy for them. It is not a problem of their listening, but it is a matter of verbal information process. It wil also influence in their: abstract thinking, idiomatic, jokes etc.

In particular, they have a problem in their listening comprehension, letter and word identification, word and syllable choice, and reading comprehension (Benner, et al. 2005). Torgesen in (Benner, et al. 2005) believes that we can divide the area of their problem into 2 area, first is their ability to recognize letter correctly and quickly. They cannot associate sound of letters and words. The second area is their language skill in oral e.g listening comprehension. Minimum language skill in oral brings to fewer vocabularies they possess and gives impact greatly on their skill of reading and writing.

Many researchers found that children with social adaptability problem often have problem in reading as well (Benner, et al. 2005). There are 4 findings related in reading skill problems and mal-adaptive problems which are: a) 25 % - 85 % children with social adaptability problem often have problem in reading as well (Betchman et al., Benner et al, Greenbaum, et al in Benner, et al. 2005), b) Prevalence between children with reading difficulty and children with

social adaptability problem tend to be stable and increase by year.

Distinguishing appearances of children with learning difficulties that commonly found, which are:

- a. Reading slowly and grudgingly
- b. Tracing the text or sentences with finger
- c. Neglecting syllable, word, phrase or line
- d. Reversing the arrangement of word or syllable
- e. Sounding known words wrongly
- f. Changing syllable with another words
- g. Arranging meaningless word
- h. Neglecting punctuation

## 2. Identification and Assessment of Reading Difficulties

Based on the developing definition, Lerner & Kline (2007) explains that there are 4 main elements led to definition of specific learning disability (LD), which are :a) central nervous system dysfunction, b) basic psychological problems, c) difficulties on doing assignment, and d) discrepancy between potential and skill.

Steps to identify learning disability (Lerner. 2006) are explained as follows:

- a) Investigation on cases related with children by collecting information about: 1) identity (children, parents, brother and sister), 2) Birth record, 3) Medical record (health, accident, disease), 4) Medical condition (diet, sleep), growth (standing, walking, sounding a first word, language disorder and locomotors body disorder (if any).
- b) Mapping of ability (able to use scissor, crayon, pencil, able to write down his name, prominent behaviour, depression state, passive or active attitude, expressive or not, love listen to story or not, other activities at school, responsibilities and so on)
- c) External and social factors (friendship, relationship with brothers and sisters, hobby, interest, parental treatment, responsibility taken).
- d) Factors at school (whether through kindergarten, class changing, teacher changing, attitude at school, special treatment).
- e) Self-acceptance (when doing assignment, adaptive attitude to new material.
- f) Psychomotoric condition (when doing writing, the writing, how to hold the pencil).
- g) Attitude when writing, reading and playing).

The research identify reading difficulties by using: 1) interview guide for parents and

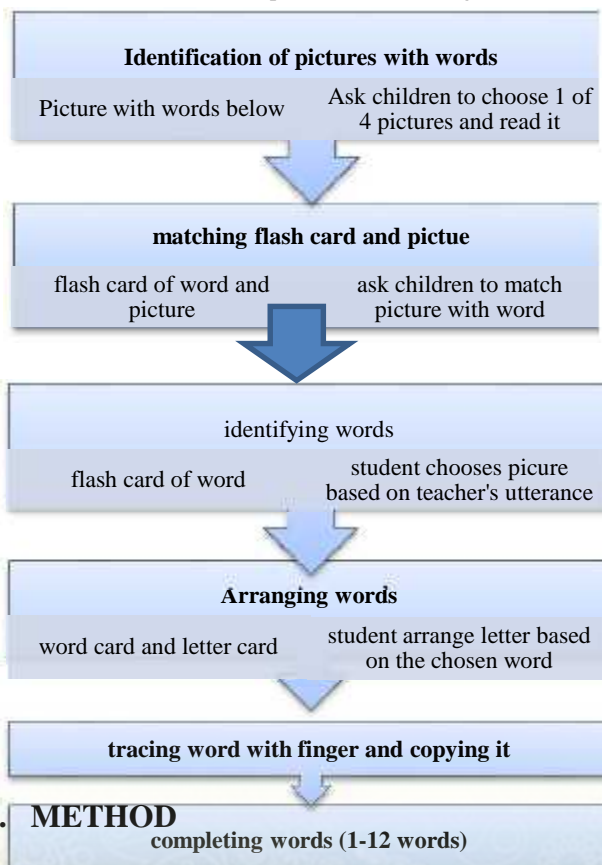
teachers, 2) observation guide to reading activities, and 3) reading instrument of first grade students (curriculum based measurement) which is in form of test of reading words in 1 minute and curriculum based assessment developed by Helen Keller International)

**3. Global Reading Method**

Global Reading Method is a reading learning method to the whole text. In 1950's, Diary of Dick and Jane published by Scott Foresman tells that whole text is an approach in learning reading. Word is taught repeatedly so that student can keep it in mind. It is what behaviourist says. This method is based on sentence approach. Teacher teaches reading and writing by showing sentence below the picture. Then student has to parse sentence into words, words into syllable and syllable into letter.

The steps of applying the method are: 1) student can read sentence by picture help. If it works, then student will read with no picture. 2) Parse sentence by words. 3) Parse word into syllable. 4) Parse syllable into letter. Visually, this is the application of the method described below:

Picture 1: Steps of Global Reading Method



**4.1 Design of Research**

The research was using SSR (single subject research) method with pattern A-B. Borg (2003) says that the design can be undertaken by choosing participants for the experiment, then deciding the behaviour target, measuring the behaviour target and applying the treatment. The research will apply global method to children assumed having specific learning disabilities which have studied reading by syllable method.

**4.2 Subject**

The research was carried out in one of Elementary School in Yogyakarta by taking subject a student named DV who has learning disability on reading based on assessment indicating some criteria of specific learning disabilities as stated by Lerner (2000):

- a. Having academic difficulty, one of them is on reading skill
- b. Writing skill and the problem solving is imbalance
- c. Showing some types of specific reading errors in children with perception disorder causing specific learning disability

**4.3 Data Collection**

Data collection in this research was carried out by some stages:

- a. Choosing subject for experimental group through curriculum-based assessment and curriculum-based measurement (CBM) which is completed by an observation guide and Bahasa Indonesia test which is suitable with curriculum of class 1.
- b. Doing measurement of reading skill of students by measuring their reading skill per minute.

**4.4 The instruments of the research are:**

- a. At the assessment point, the researcher aimed to discover problems on children's reading and the record of the cases so the instruments are: a) the result of parent's interview. The draft used to uncover information such as birth record, growing record, medical record and educational record, b) the result of teacher's interview aimed to know problems faced by children in the class, c) CBA (Curriculum Based Assessment) to understand the ability of children's reading ability and children's learning style. This assessment is developed by a team of Indonesian teachers which is modified from book *Grade Level Assessment Device for Children with Learning Problems in Schools* (HKI, 2009)

**4. METHOD**

completing words (1-12 words)

incomplete words student complete the incomplete word



- b. At the intervention point, the researcher use the measurement of reading ability by CBM (Curriculum Based Measurement) in the form of reading test which ask the subject of research to read letters (a, e, I, o, u, b, c, d, f, g, h, j, k, l, m, n, p, q, r, s, t, v, w, x, z) per minute.

**4.5 Data Analysis Technique**

Data analysis technique of the research was qualitative analysis to compare the ability of reading before and after interventions. According to Juang, S et. al (2006:43), to increase the validity of research in behavior modification using A-B design, the researcher should pay attention to several points:

- a. Define the behaviour of target being measured.
- b. Measure and note the data in baseline condition until the direction trend and the data level clearly appear.
- c. Do intervention when baseline is stable.
- d. Measure the target’s behaviour when intervention is doing continuously in a period of time until it is stable.
- e. Make a conclusion that there is a functional relationship between dependent variable and independent variable.

**5. Findings**

The subject of the research is a first-grade child in elementary school with specific learning problem. The result of assessment is:

Name : Dd (pseudonym)  
Age : 7 years old  
Educational record : Dd learned in kindergarten level for 2 years

Medical record : No serious ill. However, parent’s interview informed that Dd diagnosed as impaired attention sufferer so the subject is in psychological treatment by couple-game therapy.

Teacher information : Dd can spell letters but find difficulty on spelling words. Dd getting of letters b, a, e, i, u,o. Now, Dd learn using a module to read syllables: /ba/, /ca/, /da/, /ha/, /ga/, /ma/, /ja/, /ka/, /na/, /la/ dan /ra/. However, the teacher conveys that Dd find difficulty when letter /a/ switch with /i/.

**5.1 Case Record**

Dd’s mother informed that Dd is now 6 years old plus 9 months. Dd is the youngest child in the family. Dd’s

father and mother work as an entrepreneur and aa lecturer. No flaw on birth record. In 2000, the mother was infected by CMV. In the growing record, Dd ever got high fever caused by *fimosi*s. Dd do not eat rice. Dd’s growing record is fine except in year 3; Dd spoke too fast and unclear that Dd got electronic diet and blowing candle therapy. Dd’s educational record began in 3 months age in Childcare for 3 years. Then, Dd is drawing out to Kindergarten for 2 years.

**5.2 Assessment result using CBA (curriculum based assessment)**

Language. Dd’s language capability in the beginning of the semester grade 1. Dd had no problem on auditory ability. Dd showed the right pictures, letters and words as what Dd heard. It assumed that Dd has no difficulty on auditory perception. Dd also give comment and solve problems related to daily life easily. However, Dd showed the difficulty on visual perception. It can be assumed by:

**Table 1: Ability of reading letters**

Letters	spoken	description
b, c, d, f, g	b, c, da, fa, ga	Addition /a/
h, j, k, l, m	Ha, l, ka, l, ma	Substitution /j/-/l/
n, p,	h, t, l, b, d	Substitution /n/-/t/, /n/-/h/, /p/-/d/, /p/-/l/, /p/-/b/

**Table 2: Ability of reading words**

Words	spoken	description
Ban	ba	Omission /n/
Pil	pela	Addition /a/, Substitution /i/-/e/
Sup	pela	Distortion

Table 1 and 2 showed that Dd’s error of reading is dominated by Addition. It may happen because of the syllable method which influenced Dd to read with letter /a/. Dd can do summation fast. Dd also can answer story based question with summation under 20 in less than 2 minutes.

**5.3 Global Method for Reading Learning**

The learning needs 60 minutes. The media are:

- a. Picture card + word
- b. Word card
- c. Letter card
- d. Agreement, use to control Dd’s attitude so Dd will show 4 attitudes: sit in the chair, look into



teacher and book, do what teacher ask, and do it seriously. When Dd did those attitudes, Dd will get point. In contrast, when Dd did not do those attitudes, the teacher will get the point.

- e. Puzzle

The method begins with game Puzzle continued by agreement. Then, the learning schedule is:

- a. Read 5 pictures
- b. Re-write 5 words from pictures
- c. Pointing 1 word from 5 pictures according to instruction
- d. Spelling words (5)
- e. Games
- f. Read letters in 1 minute
- g. Dictate letters
- h. Complete 1 letter from 5 words
- i. Complete 2 letters from 5 words

Lesson plan and words list of the learning program is enclosed.

**5.4 Data of reading capability at baseline and intervention point.**

The research consist of 3 sessions aim to understand the baseline and 5 sessions aim to do intervention. Generally, Dd's reading capability at baseline has validity on 8.33 (mean) while the reading capability after intervention rises to 21.2 (mean). The tabulation of Dd's capability every session can be seen on the tables:

**Table 3: Reading capability (Baseline)**

Session	Number of right answer
1	8
2	9
3	8

**Table 4: Reading capability (intervention)**

session	Number of right answer
1	12
2	20
3	28
4	26
5	20

The analysis above is done with success criteria 50%. Juang S. et. Al (2006:68) stated that level of stability can be determined by counting

total data which on 50% stretch above and below the mean. The analysis consists of the length of condition, direction trend, stability trend, data track, Stability and stratch level, and level change. The data can be seen on the table 5.

**Table. 5 Case analysis**

	A (baseline)	B (Intervention)
1. The length of condition	3	5
2. Direction trend	Parallel (=)	(+) /
3. Stability trend	Stable	Stable
4. Data track	Parallel (=)	(+) /
5. Stability and straches level	Stable (8-9)	Stable (12-28)
6. Level change	8 – 8 = (no change)	20 – 12 (+8)

From table.5, it can be concluded that Dd's way of reading is change in the 5th day after interventions with level change (+8). The detail calculation of 6th analysis data is enclosed.

**6. Discussion**

- a. Assessment Result of Dd's need for learn

As the subject of the research, Dd assumed to have a specific learning difficulty as Lerner & Kline (2007:9) stated that there is a gap between achievement and potential. The experts suggested to use these steps to identify learning difficulties (Lerner J. , 2000):

Appreciating the gaps in academic prosperity, for example: a child is really good in Math yet has difficulties in language learning. It is strengthened by Dd's ability to solve problems on accounting or in daily life. However, Dd found extreme difficulty on recognizing symbols which differ in size (long and short) such in letters /n/ and /h/, direction (right and left) such in letters /b/, /d/, and /p/ also /j/ and /l/.

Error on thinking process of Dd headed for visual perception related to size, shape and direction. These are the types of error:

**Table 6: analysis of Dd's error type**



letters	spoken	description	analysis
b, c, d, f, g	b, c, da, fa, ga	Addition /a/	influenced by previous method which concern on syllable
h, j, k, l, m	Ha, l, ka, l, ma	Substitution /j/-/l/	Difficulty on visual direction perception
n, p,	h, t, l, b, d	Substitution /n/-/t/, /n/-/h/, /p/-/d/, /p/-/l/, /p/-/b/	Difficulty on visual direction perception /p/ = /d/,/b/ Difficulty on shape perception /h/ = /n/

**b. Ratio of Dd’s reading capability after intervention**

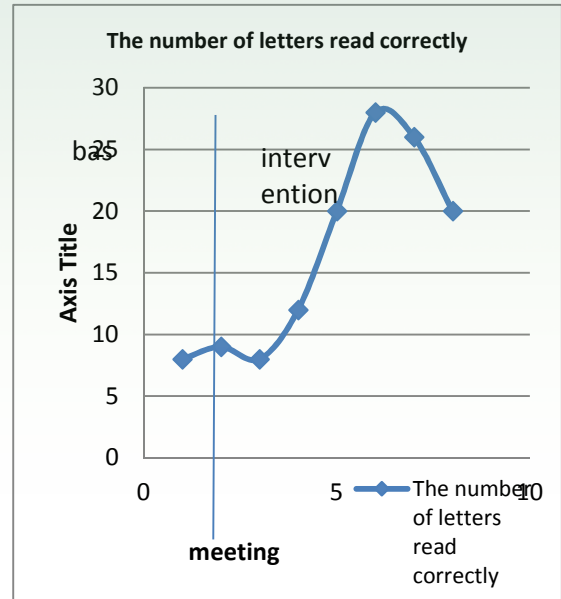
Based on the analysis, there is a significant disparity on Dd’s reading capability in baseline point and intervention point. From direction trend and level alteration point of view, Dd’s reading capability using reading syllable method is the same as before while using global method at intervention point showed an increase (+8)

The global method in this research begins with reading pictures and the students love it because they find no difficulty. Comparing letter cards and word cards is also easy for them because they just need their visual capability. Some experts declare that using pictures in reading learning is suggested to motivate the students (Bursuck & Damer, 2011:125)

Development of reading capability in picture 1 reach the peak in 28 letters but then it eases up. It happens because the test reading for letters /a/, /i/, /u/, /e/ and /o/ substituted with other consonants so the level of difficulty increases.

From the chart, it can be concluded that global reading method is more effective than reading syllable method. Reyhner (2008) said that the use of global method and reading syllable in development country is still arguable. Based on the Dd’s assessment result, it shows that the capability of visual memory is more dominant than auditory one. Then, for this case, global

method which uses visual memory is proven to be more effective.



Picture 2: Dd’s capability of reading

**7. Conclusion and Suggestion**

Global reading method is much more effective for Dd than reading by the syllable. There is an improvement (8+) in the 5th day of intervention.

It is suggested to teacher, if they find some students with dominant visual memory, they can use global reading method in handling student with reading difficulty.

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## Amalan Refleksi Dalam Penghasilan Inovasi Pengajaran –Pembelajaran di Kalangan Guru Pelatih Sains Institut Pendidikan Guru Kampus Tawau

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**Abstract:** Seorang guru yang baik akan sentiasa menilai kembali proses pengajarannya. Penilaian kembali proses pengajaran seseorang guru dikenali refleksi. Tujuan kajian ini dilaksanakan untuk mengkaji amalan refleksi di kalangan guru pelatih IPG Kampus Tawau dan sejauhmana ia membantu mereka menghasilkan inovasi sepanjang latihan mengajar. Seramai 15 orang guru pelatih sains yang telah menjalani latihan mengajar dipilih sebagai responden dalam kajian ini. Instrumen yang digunakan adalah terdiri daripada borang analisis dokumen dan temubual berstruktur ke atas responden. Data dianalisis menggunakan teknik analisis dokumen dengan berpandukan kategori penulisan reflektif Hatton dan Smith. Manakala temubual dilaksanakan bagi menguatkan lagi dapatan bagi melihat sejauhmana amalan refleksi terhadap penghasilan inovasi dalam bilik darjah. Dapatan kajian, menunjukkan 8 daripada 15 di kalangan guru pelatih berjaya menghasilkan inovasi dalam pengajaran pembelajaran. Di harapkan kajian ini dapat meningkatkan amalan refleksi di dalam menghasilkan lebih banyak alat bantu mengajar dan kaedah pengajaran yang berinovasi. Lantaran itu guru-guru pelatih harus disedarkan akan kepentingan penulisan reflektif yang betul agar mampu menjadikan mereka menjadi guru yang kreatif dan inovatif.

**Keywords:** Amalan refleksi, Inovasi, Pengajaran Pembelajaran, Guru Pelatih.

### 1 PENGENALAN

Malaysia sedang giat berusaha untuk mencapai status negara maju menjelang 2020. Oleh itu, bidang pendidikan merupakan sektor yang perlu diperkukuhkan dan ditingkatkan kerana kemajuan sesuatu negara boleh dinilai melalui kejayaan sistem pendidikan. Sejajar dengan visi dan misi negara, Institut Pendidikan Guru Malaysia berikrar melahirkan guru yang kompeten dan berjiwa pendidik melalui program pembangunan guru yang dinamik ke arah pendidikan sekolah bertaraf dunia. Bagi memastikan visi dan misi ini tercapai, amalan penulisan refleksi di dalam proses pengajaran dan pembelajaran perlu ditekan. Guru-guru perlu mempunyai kebolehan membuat refleksi tentang pedagogi mereka sendiri bagi menambahbaik amalan pengajaran mereka. Menurut Macintyre (2000), tanpa refleksi, guru tidak dapat mengubah amalan mereka. Sedar atau tidak, melalui refleksi guru dapat meningkatkan professional keguruan kerana ia bertindak sebagai satu wadah membuat keputusan yang mengakibatkan sesuatu tindakan di dalam pedagogi diambil. Dewey (1933), menyatakan

refleksi menjadi satu asas yang kukuh dalam mengkaji kognitif guru semasa membuat keputusan tentang pengajaran dan pembelajaran.

Refleksi dapat memberi peluang kepada guru untuk menilai kekuatan dan kelemahan diri. Kesannya guru boleh melihat kesan ke atas pengajaran dan pembelajaran pada kelas seterusnya. Guru merupakan pemangkin ke arah membina pemikiran yang analitikal, kritis dan kreatif pelajar. Oleh itu, guru seharusnya menguasai kemahiran dan pengetahuan yang terkini selari dengan arus transformasi pendidikan negara. Pemupukan budaya inovasi di kalangan guru juga harus ditingkatkan, bagi meningkatkan pemikiran kritikal yang sesuai dengan perubahan dalam pendidikan. Sehubungan dengan itu, guru harus meningkatkan tahap amalan refleksi yang lebih kritikal dan kritis bagi meningkatkan lagi keberkesanan pedagogi mereka.

## 2 LATIHAN MENGAJAR

Misi Institut Pendidikan Guru Malaysia ialah melahirkan guru yang kompeten dan berjiwa pendidik melalui program pembangunan guru yang dinamik ke arah sekolah bertaraf dunia. Sehubungan dengan itu, IPG telah menetapkan latihan mengajar sebanyak tiga fasa iaitu praktikum 1, 2 dan 3. Latihan mengajar adalah komponen penting dalam kurikulum latihan perguruan yang berlandaskan hasrat dan matlamat Falsafah Pendidikan Kebangsaan. Ia menyediakan peluang kepada guru pelatih mempraktikkan teori dan amalan pengajaran dan pembelajaran. Melalui pengalaman dan proses refleksi, guru pelatih akan menghasilkan ilmu binaan (situational knowledge) yang menjadi asas kepada ilmu profesional keguruan.

Melalui latihan mengajar guru pelatih dapat menunjukkan dan mengamalkan tingkah laku yang ingin diinginkan untuk mengajar secara berkesan serta cuba menggunakan segala teori yang telah didedahkan kepada mereka. Unit praktikum telah menetapkan selama 24 minggu latihan mengajar sebagai syarat pengajian program ijazah sarjana muda pendidikan.

## 3 REFLEKSI

Refleksi ialah satu elemen penting bagi meningkatkan profesionalisme perguruan. Ee (2001), menyatakan refleksi merupakan satu teknik membuat pertimbangan teliti tentang segala tindakan yang telah dijalankan oleh seseorang individu. Proses refleksi dapat membantu guru pelatih menambah baik amalan dalam pengajaran dan pembelajaran. Dewey (1933), mengemukakan refleksi adalah batu asas dalam mengkaji kognitif guru semasa membuat keputusan. Amalan refleksi yang berterusan bukan sahaja memberi impak kepada pengajaran di dalam kelas malah meningkatkan sendiri diri seorang guru. Melalui penulisan refleksi guru dapat melatih pemikiran yang lebih kreatif dan kritis.

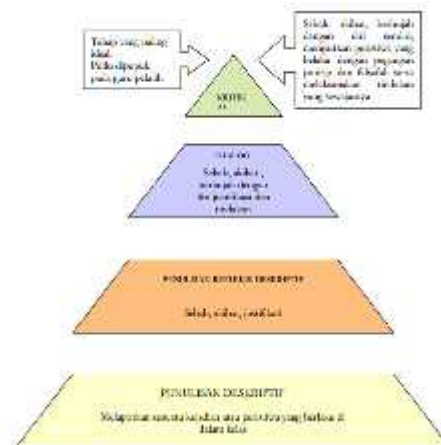
Menurut Hoover (1994), penulisan refleksi dapat menjadikan guru lebih kritis terhadap pengalaman dan masalah yang dihadapi dengan berusaha mencari alternatif bagi mengatasi masalah tersebut. Bagi guru pelatih, penulisan refleksi direkod dalam buku rancangan harian dan juga jurnal di dalam portfolio. Ong (2004) menyatakan bahawa penulisan berupaya memainkan peranan sebagai bahan bukti yang membolehkan guru menterjemahkan pemikirannya secara tersurat untuk diselaraskan dan mengambil tindakan susulan. Penulisan refleksi

bukan hanya ditulis semata-mata, tetapi hendaklah dijadikan rujukan bagi sesi pengajaran dan pembelajaran seterusnya.

## 4 TAHAP PENULISAN REFLEKSI

Tahap penulisan refleksi Hatton dan Smith (1995) dipilih bagi kajian kes ini. Terdapat empat kategori iaitu penulisan deskriptif, penulisan refleksi deskriptif, refleksi dialog dan refleksi kritikal. Tahap pertama iaitu penulisan deskriptif ialah penulisan yang melaporkan sesuatu peristiwa yang berlaku di dalam kelas secara tidak terperinci. Tahap kedua ialah penulisan refleksi deskriptif yang menyatakan sebab, akibat dan justifikasi yang tidak menyeluruh. Tahap ketiga ialah refleksi dialog iaitu lebih terperinci dengan tambahan tindakan dan hujahan yang lebih mendalam. Manakala tahap keempat iaitu refleksi kritikal ialah penulisan refleksi yang menjurus kearah pemikiran yang lebih kompleks dan berupaya mengaitkan dengan prinsip dan falsafah serta melaksanakan tindakan.

Pada tahap ini, guru pelatih sudah mampu menghasilkan alat-alat bantu mengajar dan kaedah pengajaran yang berinovasi. Penulisan refleksi guru pelatih ketika menjalankan kajian penyelidikan dirujuk menggunakan tahap ini. Latihan mengajar seharusnya dapat menjadikan guru pelatih mencapai tahap penulisan refleksi kritikal. Ramai penyelidik bersepakat mengatakan amalan refleksi merupakan matlamat yang diperlukan dalam program pendidikan guru.



Rajah 1: Tahap Penulisan Refleksi Hatton dan Smith (1995) dipetik dari Nor Hasniza (2006)

## 5 OBJEKTIF KAJIAN

- 1) Mengenal pasti tahap penulisan refleksi di kalangan guru pelatih sains IPG kampus tawau.
- 2) Mengkaji amalan refleksi dalam penghasilan inovasi pengajaran dan pembelajaran di kalangan guru pelatih sains IPG Kampus Tawau.

## 6 METODOLOGI

Kajian kes ini menggunakan kaedah kualitatif ke atas kumpulan responden yang kecil. Pendekatan kualitatif berupaya mengenal pasti secara terperinci dan lebih mendalam tentang sesuatu yang dikaji (Cohen, Manion dan Marison, 2004). Instrumen yang digunakan ialah analisis dokumen dengan mengumpul penulisan reflektif guru pelatih dalam kajian tindakan mereka. Bentuk penulisan reflektif dinilai mengikut empat tahap Hatton dan Smith. Sesi temubual pula dijalankan bagi menyokong dapatan yang diperolehi analisis dokumen.

### 6.1 Responden Kajian

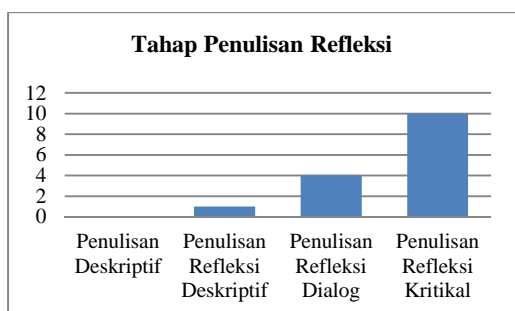
Pemilihan peserta kajian adalah menggunakan persampelan bertujuan dengan mengambil kira guru pelatih yang melaksanakan kajian tindakan semester akhir iaitu semester 8. Seramai 15 orang guru pelatih sains dipilih bagi kajian kes ini.

## 7 DAPATAN DAN PERBINCANGAN

Berikut adalah hasil tahap penulisan reflektif guru pelatih sains di dalam kajian tindakan mereka.

### 7.1 Tahap Penulisan refleksi

Tahap penulisan refleksi dari kajian tindakan guru pelatih



Rajah 2 : Penulisan refleksi guru pelatih sains

Tahap penulisan guru pelatih daripada kajian tindakan yang telah dijalankan didapati terdapat tiga tahap penulisan reflektif dikenalpasti. Tiada penulisan deskriptif di kalangan guru pelatih dan ia memang dijangkakan kerana guru-guru pelatih ini telah menjalani tiga fasa. Penulisan refleksi yang diharapkan adalah lebih ekplisit dan kritikal.

### Penulisan Reflektif Deskriptif

*“Saya mendapati murid yang lemah amat sukar untuk memahami pengelasan haiwan berdasarkan pemakanannya, masalah tersebut bukan sahaja berlaku terhadap murid lemah tetapi juga kepada murid yang pintar”*

*Murid masih tidak dapat menguasai konsep rantai makanan*

*Murid kurang berminat mengikut proses pengajaran dan pembelajaran*

(GP/L/05)

Hanya seorang guru pelatih menulis pada tahap kedua, penulisan tahap ini menunjukkan guru pelatih masih tidak berupaya mengaplikasi amalan refleksi sampai ke arah tindakan penambahbaikan. Penulisan hanya membincangkan apa yang berlaku di dalam kelas tanpa menyatakan tindakan mengatasinya. Zembal-Saul, Blumfield dan Krajcik (2000), ada menjelaskan majoriti guru pelatih sains walaupun secara teori telah diperkenalkan kepada makna pemikiran dan amalan refleksi namun mereka masih kurang berupaya untuk mengenalpasti masalah atau peristiwa yang sangat memberikan kesan terhadap pengajarannya dan perlu di beri perhatian supaya proses pengajaran dan pembelajaran dapat berjalan dengan jayanya sekali gus membantu meningkatkan kefahaman pelajar terhadap konsep sains yang diperkenalkan.

### Penulisan Refleksi Dialog

*“Masalah yang paling ketara adalah kelemahan murid dalam menguasai kemahiran.*

*Pelajar tidak dapat memindahkan maklumat daripada jadual kepada bentuk graf dan meletakkan pembolehubah pada paksi yang betul.*

*Guru berusaha mencari jalan penyelesaian bagi mengatasi masalah tersebut.*

(GP/L/07)

Terdapat empat orang guru pelatih menulis pada tahap ini. Pada tahap ini, guru pelatih sudah mampu mengenalpasti tindakan yang seharusnya diambil tetapi tidak terus mengambil langkah seterusnya pada ketika itu. Jenis penulisan ini lebih baik berbanding penulisan refleksi deskriptif.

**Penulisan Refleksi Kritikal**

*“Murid menjadi kurang responsif semasa sesi soal jawab berkaitan konsep. Guru memperuntukkan masa tambahan untuk menerangkan konsep semula.*

*Suasana kelas yang suram dan tidak bermotivasi, terdapat beberapa pelajar yang mengganggu rakan disebelahnya. Guru mengambil inisiatif mempelbagaikan intonasi suara dan menyelitkan unsur kecindan dalam penerangan.*  
(GP/P/02)

*Guru berusaha mencari jalan penyelesaian bagi mengatasi masalah tersebut.*

*“Guru mendapati kebanyakan murid mempunyai masalah menguasai konsep yang diajar serta tidak dapat menjawab dengan baik latihan yang diberikan. Guru menggunakan pendekatan konstruktivisme dalam pengajaran dan mengaplikasikan konsep 5 fasa Needham dalam prosedur pengajaran. Guru juga menerapkan elemen teknologi seperti video dan powerpoint dalam PDP.”*  
(GP/L/09)

*“Murid tidak tahu cara menjawab soalan kemahiran memerhati dengan betul, ini akan membawa kesan apabila murid ingin melaksanakan eksperimen kelak. Guru telah merancang satu teknik menjawab soalan pemerhatian yang dinamakan ‘Bulatan Panca D’ bagi meningkatkan penguasaan kemahiran memerhati di kalangan murid.”*  
(GP/P/04)

Seramai sepuluh orang guru pelatih dapat menulis refleksi pada tahap yang paling baik iaitu penulisan refleksi kritikal. Setelah melalui latihan mengajar sebanyak tiga fasa, seharusnya guru pelatih dapat menulis pada tahap ini. Menurut Hatton dan Smith, pada peringkat ini guru pelatih telah berupaya membuat hubungkait sesuatu yang berlaku di dalam kelas dengan prinsip sebagai

seorang guru, falsafah guru dan falsafah pendidikan. Penulisan refleksi ini dapat ditunjukkan dengan jelas segala tindakan yang diambil ketika pengajaran dan pembelajaran berlangsung.

**7.2 Hubungan Tahap Penulisan Refleksi dan Penghasilan Inovasi**

Jadual 1: Rumusan dapatan tahap penulisan refleksi dengan penghasilan inovasi

Bil	Responden	Tahap penulisan refleksi	Kaedah
1	GP/L/01	Kritikal	Infoladder (Inovasi)
2	GP/L/02	Kritikal	Model Fasa bulan
3	GP/L/03	Dialog	Video kartun
4	GP/L/04	Kritikal	Apakes (Inovasi kaedah)
5	GP/L/05	Refleksi Deskriptif	Kad permainan masira
6	GP/L/06	Dialog	Mnemonik
7	GP/L/07	Kritikal	Graffy tools (Inovasi)
8	GP/L/08	Kritikal	STAD
9	GP/L/09	Kritikal	Kapsul TABU
10	GP/P/10	Kritikal	Foldabel Note (Inovasi)
11	GP/P/11	Kritikal	Hands up (Inovasi Kaedah)
12	GP/P/12	Dialog	Role Play Station
13	GP/P/13	Kritikal	Bulatan Panca D
14	GP/P/14	Kritikal	Lock Key Chain kits (Inovasi)
15	GP/P/15	Kritikal	Woit (Inovasi)

Berdasarkan jadual di atas, di dapati seramai enam daripada sepuluh orang guru pelatih yang mencapai tahap penulisan kritikal berjaya menghasilkan inovasi dalam pengajaran dan pembelajaran. Inovasi berbentuk alat bantu mengajar dan juga Sebanyak empat alat bantu mengajar yang berinovasi dan dua inovasi kaedah dihasilkan.

Kebiasanya guru pelatih yang berjaya mencapai amalan refleksi yang kritikal dapat menghasilkan alat bantu mengajar yang lebih baik dan kreatif.

### 7.3 Temubual

Jadual 2: Analisis temubual Item 1

Item 1: Apa yang anda faham dengan amalan refleksi ?

Responden	Pernyataan
R1	aaa.. yang saya faham mengenai amalan refleksi adalah mengambil rumusan dan kesimpulan selepas melakukan pengajaran. Sama ada dari segi kelemahan, kekuatan dan penambahbaikan bagi kelemahan.
R2	Apa yang saya faham ialah membuat pertimbangan bagi saya perbaiki pengajaran saya. Saya banyak menulis kepada cara penambahbaikan kaedah. Penulisan refleksi akan saya tulis selepas pdp.
R3	Pada saya, refleksi adalah untuk memperbaiki diri bagi menghasilkan pdp yang lebih baik. Saya akan lihat kelemahan saya dan saya akan perbaiki, dan menulis refleksi adalah bukti yang menunjukkan saya menjalankan pdp.

Daripada temubual item 1, kesemua guru pelatih faham apakah amalan refleksi dalam bidang pendidikan. Mereka faham akan kepentingan refleksi dalam menambah baik amalan mereka. Dalam menentukan kaedah pengajaran, guru pelatih harus mereflek diri mereka bagi menghasilkan pengajaran dan pembelajaran lebih baik.

Jadual 3: Analisis temubual Item 2

Item 2: Sejauhmana anda membuat refleksi dalam buku rekod mengajar?

Responden	Pernyataan
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R1

Refleksi ni adalah sesuatu yang wajib ditulis bagi saya menilai diri saya dan murid. Adakah pengajaran saya berkesan atau tidak. Jadi setiap kali habis pengajaran saya akan membuat refleksi sama ada strategi pengajaran saya berkesan atau tidak

R2

Mmmm ...pada awalnya, praktikum fasa 1, saya lakukan refleksi hanya tentang murid sahaja. Tetapi semakin lama amalan refleksi saya semakin baik di mana saya lebih menumpukan kaedah pengajaran, kelemahan dan kelebihan terhadap sesi pengajaran.

R3

Aaaa....setiap kali pdp, selepas mengajar saya akan terus menulis di ruangan refleksi kerana kalau tidak ditulis, saya takut lupa. Saya akan tulis kekuatan, kelemahan saya. Bagi Journal mingguan pula saya akan tulis cara saya mengatasi kelemahan pdp saya dengan membuat rujukan.

Dalam temubual item 2, semua responden membuat refleksi setiap kali selesai proses pengajaran dan pembelajaran. Guru pelatih setuju di mana penulisan refleksi semakin baik setelah menjalani tiga fasa latihan mengajar. Mengenalpasti kekuatan, kelemahan dan cadangan penambahbaikan dapat membantu guru pelatih meningkatkan pengajaran dengan alat bantu mengajar yang berinovasi.

Jadual 4: Analisis temubual Item 3

Item 1: Daripada amalan refleksi yang ditulis, berapa banyak inovasi yang telah dilaksanakan atau direka?

Responden	Pernyataan
R1	Seingat saya, setiap kali praktikum saya akan membuat inovasi sama ada alat bantu mengajar atau kaedah pengajaran yang digunakan. Sekurang-kurangnya satu inovasi telah sy buat sepanjang latihan

*mengajar, Cuma bagi fasa 3. sy telah menghasilkan lebih banyak inovasi dihasilkan kerana saya banyak belajar daripada latihan mengajar sebelumnya.*

R2 *Saya tidak pasti berapa...setiap kali pengajaran saya akan menghasilkan alat bantu mengajar yang berbeza. Saya tidak sedar adakah ia inovasi atau tidak. Apa yang saya lakukan ialah menghasilkan alat bantu mengajar yang memudahkan murid. Alat bantu mengajar saya semakin kali semakin baik sehingga ke praktikum 3.*

R3 *Pada saya, mungkin 2 atau 3 kot. Inovasi yang saya buat di dalam kelas adalah on the spot. Saya perhatikan pelajar sangat gembira dengan inovasi yang saya buat. Inovasi ini telah saya menangi dan saya akan terus membuat ABM yang lebih baik masa akan datang.*

Ketiga-tiga guru pelatih bersetuju terdapat penambahbaikan dari segi alat bantu mengajar yang dihasilkan sepanjang latihan mengajar yang diikuti. Terdapat bukti penghasilan alat bantu mengajar yang banyak namun guru pelatih tidak dapat membezakan sam ada ABM tersebut adalah inovasi atau tidak.

## 8 KESIMPULAN

Pendidikan di Malaysia telah menjalani beberapa fasa transformasi. Ini adalah bertujuan untuk menjadikan pendidikan di negara ini mampu bersaing dengan negara-negara maju. Guru adalah wadah utama untuk merealisasikan harapan ini. Keberkesanan sesuatu pengajaran dan pembelajaran banyak bergantung kepada kaedah atau teknik yang digunakan oleh seseorang guru di dalam kelas. Guru yang cemerlang hendaklah sentiasa melaksanakan refleksi sendiri serta amalan dalam pengajaran dan pembelajaran. Penulisan refleksi yang kritikal mampu melahirkan guru yang kompeten dan bersedia bersaing dalam dunia globalisasi.

## 9 PENGHARGAAN

Pertama sekali kami ingin mengucapkan syukur ke hadrat ilahi atas limpahan rahmatnya telah memberi kesihatan dan kekuatan kepada kami sehingga berjaya menyiapkan kajian kes ini.

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# CHALLENGES AND OPPORTUNITIES IN IMPLEMENTING PROBLEM BASED LEARNING (PBL) MODEL IN MATHEMATICS CLASSROOM

*The Case of Ninth Grade Mathematics at Laboratorium School in Indonesia  
University of Education (UPI)*

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**Abstract:** Problem based learning (PBL) is a constructivist approach to learning. PBL is a student centered instructional strategy in which students collaboratively solve problems in a group, (ideally 6-10 students) and reflect on their experience. Students are encouraged to exchange ideas, feelings, experiences, information and insights, to tease out and define the limits of their existing knowledge and together actively build a new level of understanding that could be achieved individually. In this paper an attempt was made to examine the challenges of implementing PBL in Mathematics classroom in a Junior Secondary School at Laboratorium School of Indonesia University of Education(UPI). More specifically, this paper was to answer the question “What are the challenges in implementing PBL to Mathematics classroom? What are the opportunities that PBL brings to both students and mathematics teachers at this level? Data was collected from 23 Math and Science teachers from Indonesia University and Ethiopian TCTP groups by using observation check-lists in an open lesson study class. To achieve the intended objectives a mixed approach (Qualitative and quantitative) methods of data analysis was used. The study revealed that two variables namely **Tutor Behaviour** and **Team work** found to be the major challenges in implementing PBL to Mathematics Classroom in grade nine. However, the other five variables (**Prior knowledge, Quality of the problem, Student centeredness, Group Dynamics** and **Ground Rules**) were found to be minor challenges in the process of PBL. The study also revealed that there are some significant opportunities of using PBL in Mathematics classroom that all Mathematics teachers should consider.

**Keywords:** Problem based learning(PBL), Problem solving, Challenges and opportunity

## 1 INTRODUCTION

Problem-based learning (PBL) is a constructivist educational approach that organizes curriculum and instruction around carefully crafted “ill-structured” problems (Barrows, 1988). Guided by teachers acting as cognitive coaches, students develop critical thinking, problem solving, and collaborative skills as they identify problems, formulate hypotheses, conduct data searches, perform experiments, formulate solutions and determine the best “fit” of solutions to the conditions of the problem. Problem-based learning enables students to embrace complexity, find relevance and joy in their learning, and enhance their capacity for creative and responsible for real world problems.

The goals of PBL are to help the students develop flexible knowledge, effective problem solving skills, self-directed learning, effective collaboration skills and intrinsic motivation.

When thinking about implementing PBL in our teaching contexts, the words of Marinovich (2000) provide a pertinent perspective on the differences

between PBL and traditional classrooms and the implications for us as teachers: it is easy to overlook the many ways in which PBL goes against the grain of faculty and postsecondary educational life. While faculty are devoted to their discipline, eager to dispense knowledge, and content-oriented, PBL asks them to be student-centred, guiding rather than directive, and process-oriented (p. 3). It is easy to conjure up images of traditional classrooms with tables and chairs in rows, and the teacher at the front of the classroom “dispensing knowledge”. But Marinovich reminds us that perhaps the image we have we think about PBL is, or should be, different. The notion of being “student-centered”, “guiding rather than directive”, and “process-oriented” arise from research into learning and learning theories. The roots can be found in a learning theory broadly labeled “constructivism”. Although the conceptual links between constructivism and PBL are rarely discussed in the literature, examining constructivism more closely may reveal some insights into some origins of the practice of PBL

In the PBL process students work in groups, identify what they already know, what they need to know, and how and where to access new information that may lead to resolution of the problem. The role of the instructor (known as the tutor in PBL) is to facilitate learning by supporting, guiding, and monitoring the learning process. The tutor must build students' confidence to take on the problem, and encourage the students, while also stretching their understanding. PBL represents a paradigm shift from traditional teaching and learning philosophy, which is more often lecture -based. However, as the teaching learning in general and the teaching of Mathematics in particular is concerned PBL model is not been frequently used by classroom teachers in Ethiopia. Therefore in this paper an attempt was made to implement PBL in Mathematics classroom at Junior secondary school at Indonesia University of Education and thereby to examine the challenges and opportunities during it's implementation. More specifically this paper tries to answer the following basic questions. What are the challenges in implementing PBL in grade nine Mathematics classroom? What are the opportunities that PBL brings to both mathematics teacher and students of grade nine?

### 1.1 Factors Determining the Successful Implementation of PBL

Many factors are needed in order to achieve a successful PBL that leads to achievement of acquisition of retrieval knowledge. Those factors are:

1. **Prior knowledge:** the amount of prior knowledge and activation of the prior knowledge in the discussion is very important determinant of the achievement and increasing the interest in the subject matter. The prior knowledge is one of the elements in the constructivism theory of learning
2. **Quality of the problem:** The well constructed problem will trigger and stimulate discussion and will increase the time spent in the tutorial group and in self study.
3. **Tutor Behaviour:** The tutor that maintains the discussion to the context of the problem will increase the quality of the problem.
4. **Student centeredness:** Motivation of the students is increased when the learning is his/her responsibility. This will lead to

application of the self determination for learning.

5. **Team work:** the well functioning team will lead collaboratively to efficiency in all steps of PBL process.
6. **Group Dynamics:** Group dynamic will ensure that every one is participating efficiently and effectively, this will lead to improve the team work.
7. **Ground Rules:** Organization is one of the principles of learning, ground rules are very important in maintaining the organization of the tutorial group and maintain group dynamic.

### 1.2 Statement of the Problem

Several medical schools around the globe have incorporated problem-based learning into their curricula, using real patient cases to teach students how to think like a clinician. More than eighty percent of medical schools in the United States now have some form of problem-based learning in their programs. Research of 10 years of data from the University of Missouri school of Medicine indicates that PBL has a positive effect on the students' competency as physicians after graduation

In Malaysia, an attempt is being made to introduce a problem-based learning model in secondary mathematics, with the aim of educating citizens to prepare them for decision-making in sustainable and responsible development.

In 2008, Parramatta Marist High School a secondary Catholic school in Australia employed the methods of PBL in their teaching for year 9 and 10 boys. The learning system was a great success and since has been expanded to lower grades to challenge students to think outside of the box and relate content drive courses to problems in the real world.

In 2002, Gadjah Mada University of Yogyakarta, Indonesia began offering an International Medicine program based on problem-based learning. Gazeira University in Sudan was the first in the country to adopt PBL in its medical college, a trend that was followed by some of the newer medical colleges. In 2008 the famous Faculty of Medicine of the University of Khartoum, which was following a traditional curriculum since its foundation in 1924 made a being change in

curriculum structure by adopting a blend curriculum that incorporate problem solving learning strategies.

Some documents indicate that this method is being under use in some Medical schools in Ethiopia and other African countries. However, there are no evidences showing that PBL was used as an instructional Model both in Ethiopia where the researcher had carried out his 12 years of teaching carrier. My observation of classes here in Indonesia University of Education (UPI) also indicates that this model is not used by Math and science teachers. Therefore, the researcher seeks to know why the PBL is not frequently used by Math and science teachers in UPI. Based on this observation, the following basic research questions were formulated by the researcher. What are the challenges in implementing PBL in grade nine Mathematics classroom? What are the opportunities that PBL brings to both mathematics teacher and students of grade nine?

### 1.3 Statement of the Problem

Advocates of PBL claim that using PBL model for classroom instruction enhance content knowledge while simultaneously fostering the development of communication, problem-solving, critical thinking, collaboration, and self-directed learning skills. PBL may position students in a simulated real world working and professional context which involves policy, process, and ethical problems that will need to be understood and resolved to some outcome. By working through a combination of learning strategies to discover the nature of a problem, understanding the constraints and options to its resolution, defining the input variables, and understanding the viewpoints involved, students learn to negotiate the complex sociological nature of the problem and how competing resolutions may inform decision-making. This study is important for teachers in the primary, secondary and university so that they could have a chance to shift their teaching paradigm from more teacher dominant traditional classroom to a modern style student centered and active learning approach which best suits with the 21st century young generation. The study will also be so important for curriculum designers, educational supervisors and policy makers to give priority to this method in any curriculum revision in the future.

## 2 THEORETICAL FRAMEWORK

### 2.1 Constructivism and PBL Model

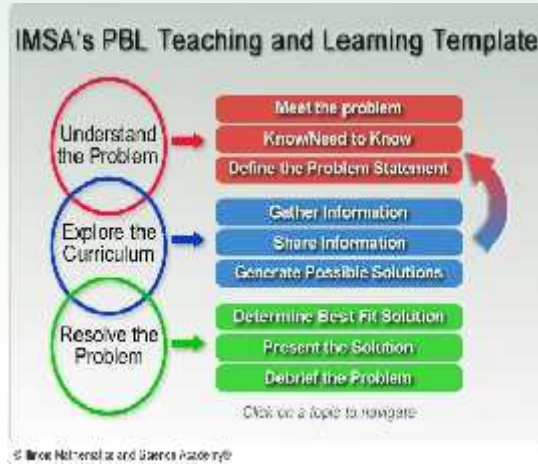
Problem Based Learning addresses the need to promote lifelong learning through the process of inquiry and constructivist learning. PBL can be considered as a constructivist approach to instruction, emphasizing collaborative and self-directed learning and being supported by flexible teacher scaffolding. Yew and Schmidt, Schmidt, and Hung elaborate on the cognitive constructivist process of PBL as follows.

1. Learners are presented with a problem and through discussion within their group, activate their prior knowledge.
2. Within their group, they develop possible theories or hypotheses to explain the problem. Together they identify learning issues to be researched. They construct a shared primary model to explain the problem at hand. Facilitators provide scaffold, which is a frame work on which students can construct knowledge relating to the problem.
3. After the initial team work, students work independently in self directed study to research the identified issues.
4. The students re-group to discuss their findings and refine their initial explanations based on what they learned.

The are seven steps in PBL process. These are:

1. Clarify terms and concepts not readily comprehensible
2. Define the problem
3. Analyze the problem,( brainstorming).
4. Resolve issues based on prior knowledge (inventory of explanations)
5. Formulate learning objectives
6. Information gathering, (self-study)
7. Synthesize and test the newly acquired information

Figure: IMSA’s PBL Teaching and Learning Template



PBL follows a constructivist perspective in learning as the role of the instructor is to guide and challenge the learning process rather than strictly providing knowledge. From this perspective, feedback and reflection on the learning process and group dynamics are essential components of PBL. Students are considered to be active agents who engage in social knowledge construction. PBL assists in processes of creating meaning and building personal interpretations of the world based on experiences and interactions. PBL assists to guide the student from theory to practice during their journey through solving the problem.

### 3 METHODOLOGY

#### 3.1 Study Design

In this study both qualitative and quantitative (mixed approach) was used

#### 3.2 Target Population

Math and science teachers at Laboratorium school of UPI and Ethiopian TCTP group

#### 3.3 Sample Size and Sampling Technique

Seventeen teachers from indonesia university and six teachers from Ethiopia(TCTP) groups a total of twenty three Math and science teachers have been

involved in this study. Available sampling was used in this case.

### 3.4 Data Collection Instrument

Observation checklist was used as the main data collection instrument.

#### 1.1 3.5. Method of Data Analysis

Descriptive statistics such as percentage, median and mode were used as the main statistical tool in this research.

## 4 DATA PRESENTATION AND ANALYSIS

### 4.1 Participants Background

As table 4.1 shows there are 17 participants (six males and eleven females) from indonesia university of education and six participants (one Female and five Males) from Ethiopian Teacher education Colleges (TCTP group) composing the total number of participants in this study to be 23. The age group and the teaching experience they have is as indicated on the table above.

Data was collected by using an observation check-list which is a five point Likert scale. The questionnaire contains seven variables in which the researcher think challenges on the implementation of PBL in Mathematics classroom. There are 15 close ended questions and one open ended question in this check-list as the responses were organized by the following table.

Table 4.2 the frequency and percentage of responses obtained from the five-point likert scale

As table 4.2 above shows for question 1.1, 26,09% of the respondents disagree, 17,39% were neutral, 34,78% were agree and 21,74% where strongly agree. Similarly for question 1.2 which is in the same category as Q1.1, 30,43% of the respondents were disagree 4,35 % were neutral 52,17% were agreed and 13,04% were strongly agreed.

Similarly for question 2.1, 4,35 % of the respondents are strongly disagree, 26,09 % were disagree, 17,39 % were neutral, 34,78% were agree and 17,39% where strongly agree. Similarly for question 2.2, 8,70 % of the respondents were disagree, 17,39% were neutral 60,87% were agreed and 13,04% were strongly agreed

In the same way for question 3.1, 13,04% of the respondents disagree, 34,78 % were neutral, 34,78 % were agree and 17,39 % where strongly agree. For question 3.2, 30,43 % of the respondents were disagree 34,78 % were neutral 21,74% were agreed and 13,04% were strongly agreed

For question 4.1, 4,35% of the respondents disagree, 17,39% were neutral, 69,57% were agree and 8,70% where strongly agree. Similarly for question 4.2, 8,70% of the respondents were disagree 21,74% were neutral 60,87% were agreed and 8,70% were strongly agreed

For question 5.1, 17,39% of the respondents disagree, 21,74% were neutral, 34,78% were agree and 26,09% where strongly agree. Similarly for question 5.2, 13,04% were neutral 69,57% were agreed and 17,39% were strongly agreed. On the same way for question 5.3, 4,35% of the participants were neutral, 78,26% agree and 17,39% respondents were strongly agreed

For question 6.1, 13,04% of the respondents disagree, 30,43% were neutral, 52,17% were agree and 4,35% where strongly agree. Similarly for question 6.2, 4,35% of the respondents were disagree 34,78% were neutral 56,52% were agreed and 4,35% were strongly agreed

Finally for question 7.1, 8,70% of the respondents disagree, 13,04% were neutral, 60,87% were agree and 17,39% where strongly agree. Similarly for question 7.2, 17,39% of the respondents were disagree 26,09% were neutral 43,48% were agreed and 13,04% were strongly agreed

The following table shows the median and mode of respondents on the five- point likert scale obtained through the same check-list.

As you can see on the table 4.3 above the median and modal value was calculated for the the response of 23 participants obtained through a five point likert scale. Based on this, let's see the median and modal values of each of the seven variables.

1. Prior knowledge: As the table above clearly shows the median calculated is 4 and the modal value is also 4. This results shows that most of the respondents agreed that students have been activated to use their prior knowledge and applied their prior knowledge to solve the problem under discussion
2. Quality of problem: As the table above clearly shows the median calculated is 4 and the modal value is also 4. The results indicate that most participants agree that

the problem is well designed in such a way that it triggers and stimulates discussion and is related to students real life so that it promotes contextual learning.

3. Tutor's behaviour: As the table above clearly shows the median calculated is 3.5 and the modal value is 3. As the result here shows most participants are neutral on the idea that the tutor has maintained the discussion to the context of the problem which will increase the quality of the problem by asked open questions to stimulate the discussion. Here the median 3.5 also indicates the respondents are between neutral and agree.
4. Student-centeredness: As the table above clearly shows the median calculated is 4 and the modal value is also 4. This shows that respondents agree that students have been motivated to to be responsible for their own learning and they were active participants in a group discussion which lead to a self directed learning.
5. Team-work: As the table above clearly shows the median calculated is 4 and the modal value is also 4. As the median and modal values obtained shows that participants agree that each group developed a team spirit and working collaboratively that lead to efficiency in all steps of PBL process. They also agree that students share information within their group and listen to and respect contributions of others in a group.
6. Group dynamics: As the table above clearly shows the median calculated is 3.5 and the modal value is also 4. Here we see that most participants still agree that every group member is participating effectively and each group follow the steps of the process of PBL as it has been agreed upon. But the median value shows that they are in between neutral and agree wich shows still there is a challenge in mantaining group dynamics.
7. Ground rules: As the table above clearly shows the median calculated is 4 and the modal value is also 4. As we can observe from the table that the participants agree

that the activity is well organized and ground rules are set to maintain the organization. They also agree that ground rules were strictly followed by groups and maintained group dynamic.

In the check-list there was one open-ended question stated as “Give the tutor tips for improvement (short and precise).”. The response obtained from the participants is as follows. For the open-ended question 17 participants responded in Bahasa Indonesia and later it was translated into English.. Here I would like to inform you that each Capital letter below represents a code of each respondent and its English version was put in italics in the paranthesis. If there is any inconvineces with my translation it is still open for correction

A: Permasalahan dalam pembelajaran dengan pendekatan PBL tidak mendapatkan penekanan yang jelas, serta tahapannya tidak terlihat jelas(*Problems in learning with PBL approach did not get a clear emphasis, as well as the stages are not clearly visible*)

B: Tahapan PBL belum terlihat dengan jelas, sehingga pembelajaran dirasakan seperti pembelajaran biasa. Sebaiknya tahapan-tahapan pbl dapat di sajikan lebih jelas dari awal pembelajaran dengan pemberian masalah yang ada relevansinya dengan materi yang akan di bahas (*PBL stages have not seen clearly, so it felt like learning conventional learning. It would be better if PBL learning stages be presented more clearly from the outset that the problem of learning with the provision of no relevance to the material that will be discussed*)

C: Tahapan PBL tidak terlihat, pembelajaran seperti konvensional. seharusnya guru memberikan soal di awal pembelajaran dengan pemberian masalah setiap kelompok diberi permasalahan yang sama. Anggota kelompok bersama-sama menyelesaikan soal tersebut. Saat presentasi setiap kelompok menyajikan hasil diskusinya(*PBL stages are not visible, such as the conventional learning. Actually the teacher in using PBL should give the same problem at the beginning of the learning to each group given a problem giving the same problem. Together, all the members of the group solve the problem. Then each group must present the results of their discussion.*). Guru memberikan penguatan, memperbaiki setiap kesalahan(*The Teacher should provide reinforcement to fix any error*)

D: Pada pembelajaran yang menggunakan pendekatan PBL, biasanya disajikan sebuah permasalahan di awal pembelajaran. Pada

pembelajaran tadi siswa hanya mengerjakan soal biasa secara berkelompok, tidak ada tahapan dalam pbl (*In PBL learning approach, usually a problem is presented at the beginning of the lesson. In the earlier lesson students only do the problem as usual in groups, there are no PBL stages* )

E. Akan lebih bermakna jika peran siswa diberi porsi yang Lebih banyak(*It would be more meaningful if the students are given more opportunity ( time). Soal-soal yang dikerjakan lebih baik jika soal-soal problem solving( It would be better if those Problems that should be solved are typically problem solving)* 3. Pendekatan bahasa lebih efektif jika menggunakan bahasa sejenis(*The use of language would be more effective when using similar language*)

F: Upayakan aktifitas siswa lebih aktif lagi. Artinya dalam kelompok siswa lebih aktif lagi dari semua anggota kelompok tersebut (*Try to make the students more activey during group activity*). Upayakan pembelajaran student-center jangan terlalu banyak di dominasi guru(*In student-center learning the dominance of teachers should be minimized*)

G: Kegiatan pembelajaran tidak tampak penggunaan pendekatan pbl, dan tidak ada tahapan. Tahapan pbl dalam kegiatan pembelajarannya(*Learning activities do not seem to use PBL approach, and there is no PBL stages in the learning activity*)

H :Siswa harus lebih aktif dengan pemberian soal yang kontekstual dan merangsang keinginan siswa (*Students should be active by providing a contextual problem and stimulate students' desire*). Tahapan pbl harus lebih tampak dengan cara pemberian soal masalah di awal pembelajaran(*Pbl stages must be seen by providing problem to be solved at the beginning of the learning process*)

I: Dominasi guru dikurangi dengan lebih mengaktifkan keterlibatan dan kreativitas siswa(*Dominance on the teachers side should be reduced by involving the students to be more creative*). Persoalan yang diberikan pada siswa sebaiknya yang lebih kontekstual (*Problem given to the students should be more contextual*)

J: 1:sebaiknya pada saat pendahuluan siswa yang harus di aktifkan agar diketahui pengetahuan prasyarat yang jelas mereka miliki(*preferably at the time of the introduction of students who are known to be activated in order to clear the prerequisite knowledge that they have*). 2. soal-soal yang diberikan siswa sebaiknya soal-soal problem solving yang menantang siswa mencari solusi dengan

pengetahuan yang jelas mereka miliki bukan soal-soal rutin yang hanya mengeksplorasi keterampilan prosedural siswa saja (*questions that students should be given preferably are problem solving questions that challenge students to look for solutions with the knowledge that they have clearly not routine matters that only students explore procedural skills course*)

K: Pada saat membimbing kelompok tutor memberikan bimbingan dan penguatan mengenai langkah-langkah pemecahan masalah tersebut bukan hanya sekedar penyelesaian secara prosedural (*By the time the group guiding, tutors provide guidance and reinforcement of the steps in solving the problem, and not just the completion of the procedure*)

L: Tahapan PBL tidak dijelaskan di awal sehingga banyak siswa tidak mengikuti prosesnya (*PBL stages are not described in the beginning so that many students do not follow the process*)

M: Permasalahan dalam pembelajaran dengan pendekatan pbl kurang begitu mendapatkan penekanan (*Problems in learning with PBL approach recieved less emphasis*)

N: Guru kurang merespon siswa yang aktif, lebih memperhatikan respon yang di keluarkan siswa sebagai umpan balik (*Teachers respond to students who are less active, more attention to students' responses issued as feedback*). Masalah sebagai inti dari pbl tidak di kemukakan dengan jelas, sebaiknya pada awal kegiatan inti pembelajaran di mulai dengan masalah bukan berupa soal cerita (*Problems as the core of pbl not state clearly, preferably at the beginning of the core activities of learning begins with a problem is not a matter of the story*)

O: Dalam pembelajaran yang telah dilakukan tidak kelihatan langkah-langkah pbl yang ada. Pembelajaran masih kontekstual, namun interaksi dalam pembelajaran sudah baik (*In teaching and learning processes that have been there was no sign of pbl steps there. Learning is contextual, but interaction in learning is good*)

P: Proses pembelajaran masih bersifat prosedural, guru/tutor belum mengajarkan anak untuk memahami konsep secara benar (*The learning process is still procedural, teachers/tutors have not teach children to understand the concept correctly*)

R: It would be better if you make them to drive a formula, they draw, cut and measure...to develop their skill

T: It would be much better if students are given real problems and hands-on activities which enable them to find the volume, surface area....

U: In my opinion the problems (exercises) given to students should be related with students daily

experience. Moreover they have to cut, measure the radius the slant height, the diameter....by themselves.

## 5 DISCUSSION OF FINDINGS

### 1. Prior Knowledge

There were two questions under this category. As the analysis of percentage in table 4.2 shows that the majority of respondents (56.52%) for Q 1.1 and 65.21% for Q1.2 rated above neutral. This shows that the majority of respondents argue that this variable (components) of PBL was quite done well. Where as those who rated neutral and below are also a considerable amount of percentage. So here I understand that this stage of implementing the process of PBL is not a major challenge but still needs more improvement in the coming lessons. Moreover, as table 4.3(a) clearly shows the median and mode of the data distribution were both 4 (Agree). This also confirms that majority of the respondents consider prior knowledge not as a big challenge which is of course go in line with the percentage in table 4.1

### 2. Quality of the problem

There were two questions under this category. As table 4.2 shows the majority of respondents (52.17%) for Q 2.1 and 73.91% for Q2.2 rated above neutral. This shows that the majority of respondents argue **Quality of the problem** as a process of PBL was still not a big challenge. However, the rest of responses rated neutral and below should be taken into consideration indicating a need for further improvement. As table 4.3(a) shows that both the median and mode calculated were 4 (Agree). Hence, this both analysis leads me to the same argument that **Quality of the problem** was not badly altered but is still open for improvement. Remember: formulating a good problem would stir the learning process and of course the students will work hard and enjoy solving such challenging problem)

### 3. Tutor Behaviour

Two questions were provided under this category. The percentage in table 4.2 depicts that the majority of respondents (52.17%) for Q 3.1 and 34.78% for Q3.2 rated above the cut off neutral.. Moreover, table 4.3(a) shows that the median



calculated is 3.5 and the modal value is 3. This shows that most participants are neutral on the idea that the tutor has maintained the discussion to the context of the problem which will increase the quality of the problem. Hence **Tutor’s Behaviour** is found to be the major Challenge determining the implementation of PBL in this particular study.

#### 4. Student-Centeredness

This category has two questions. The analysis in table 4.2 shows the majority of respondents(78.27%) for Q 4.1 and 69.57% for Q4.2 are rated above neutral. Based on this data **Student centeredness** was not a major factor(Challenge) during the implementation process. As table 4.3(b) shows both the median and mode are 4. This claims the fact that students have been motivated to be more responsible for their own learning. Hence **Student-centeredness** is not found as a major challenge in my PBL implementation.

#### 5. Team work

There were three questions under this category. The result shows that 60,87%, 86.96%, 95.65% are rated above agree for questions 5.1, 5.2 and 5.3 respectively. This show that **Team work** as a process of **PBL** is not a big challenge. However, the median calculated in table 4.3(b) is 3.5 and the modal value is 4 for the same parameter which in fact shows inconsistency between the percentage and the measure of central tendency. Hence, this research revealed that **Team work** as one of the major challenging parameter in the process of implementing PBL. (Students contribution in group activity is the major part. How much they contribute should be taken into account)

#### 6. Group Dynamics

Under this parameter I had two questions. The result of analysis in the table 4.2 shows that majority of the respondents(56.52%) for Q 6.1 and 60.87% for Q6.2 rated above neutral and it reveals that this variable was not apperad to be a major challenge in the observed lesson activity;however, a considerable portion of responses indicate a need for improvement for better achievement in Group Dynamics (sharing ideas/exchange strategies should be taken into account in considering group dynamics)

#### 7. Ground Rules

More likely as most of the above parameters **Ground Rule** also had two questions. The percentage of respondents rated above nuteral for

question(7.1) was 78.26% and 56.52% for question 7.2. Both results show that respondents argue very positively to the implementation of this parameter in the PBL process;however, the rest of respondents considered this area as an area for further improvement. As table 4.3(b) clearly shows that both the median and modal value is 4 which actually agrees with the percentage already calculated. The conclusion is that the respondents agree that the activity was well organized, ground rules are set and were strictly followed to maintain the organization.

Finally the responses for open-ended question show that most of the participants suggested that some of the stages of PBL were not worked out well and the classroom was mainly teacher dominated. Yes.... Solving open ended problems need the student to be creative, flexible, brings new ideas, as well as different strategies)

## 6 CONCLUSIONS

The main objectives of this small scale research was to answer the following Basic questions. What are the challenges determining the in implementing PBL in grade nine Mathematics classroom? What opportunities does the implementation of PBL brings to both clasrrom teacher and students in the indicated grade level? To answer the above basic questions seven possible facors(variables) were figured out and tested in mathematics classrom to examine the challanges and oportunites(if any) during the implementation process.

As I’ve discussed in Section 5 above, I’ve found that only two of the variables(**Tutor Behaviour** and **Team work**) to be the major challenges and the rest five i.e Prior knowlege,quality of the problem ,Student-centeredness, Group Dynamics and Ground Rules are found to be the mainor challenges in this particular study. I also came to realize that all the seven variables are the real challenges on the ground while implementing PBL; however,the degree of challenge they pose varies depending up on the type of situation on the ground.

Moreover, all the challenges(both major and minor) come up with new opportunities for both students and the teacher(Me) in this study. To mention some forinstance, as the result of one of the major challenge “Tutor Behaviour”, it helped me to see my self as a dominant classroom teacher(teacher-centered approach) so that i had to shift my approach to a more participatory and student-centered paradigm of teaching-learning. The other exceellent opportunity i had was concerning the

other major challenge called “team work”. i.e some of the groups members were boring because of my dominance and a language barrier I have in Indonesian language (Bahasa Indonesia) which helped me to improve my Indonesian language.

## 7 RECOMMENDATION

Based on the findings of this research I have the following recommendations

1. Teachers of Mathematics in the junior secondary school to try out PBL in their classrooms, and should try to formulate good and useful challenging problems.
2. Implementing PBL in Mathematics classroom has great opportunity for both Math teachers and students as they will improve their skill in teaching and learning
3. It is a time for Math teachers to shift from traditional and outdated teacher-centered approach to a more engaging modern teaching model like PBL to improve students' problem solving skill as soon as possible.

Education experts in collaboration with school leadership should pay due attention to scale up Math teachers' knowledge and skill in how to implement PBL at classroom level.

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## Penggunaan Newsmaker Dalam Membina Kemahiran Bertutur

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**Abstract :** Guru-guru mendapati para pelajar secara umumnya masih belum yakin untuk bertutur lebih-lebih lagi apabila berdepan dengan khalayak. Oleh yang demikian, bangkit satu keperluan bagi guru-guru untuk membina kemahiran bertutur dalam kalangan pelajar. Dalam menyahut seruan Kementerian Pendidikan yang menyokong penyerapan ICT dalam pengajaran, Kajian Pengajaran ini dijalankan dengan tujuan khusus meneliti perkembangan dan respons para pelajar terhadap penggunaan media baru dalam menggalak mereka membina kemahiran bertutur – lebih spesifik lagi untuk membina motivasi dalam menjawab komponen perbualan bergambar bagi kemahiran lisan. Perisian *Newsmaker* telah dipilih berdasarkan ciri-cirinya yang mesra pengguna dan kemampuannya untuk melentur kemahiran menulis, membaca dan membuat penyampaian dalam kalangan pelajar. . Dapatan kajian menunjukkan bahawa pelajar-pelajar yang mengikuti kajian pengajaran ini dapat meraih manfaat dalam membina kemahiran bertutur mereka. Pelajar-pelajar juga dapat melakukan pembelajaran kolaboratif menerusi proses menilai rakan mereka dengan rubrik yang telah disediakan. Menerusi proses penilaian ini pelajar dapat memperbaiki prestasinya berdasarkan teguran rakan-rakannya.

**Kata Kunci :** Pembelajaran berpusatkan pelajar, penilaian rakan sebaya, rubrik, kemahiran bertutur, Newsmaker

### 1. PENGENALAN

Guru memilih tajuk ini kerana kemahiran bertutur merupakan salah satu kemahiran asas yang perlu dimiliki dan dikuasai oleh para pelajar untuk mendapatkan keputusan yang cemerlang dalam sesebuah peperiksaan bahasa Melayu. Hal ini jelas diperlihatkan melalui pemberatan peratusan bagi komponen lisan dalam peperiksaan GCE Peringkat ‘O’ dan GCE Peringkat ‘N’ yang mencecah angka signifikan 20%. Berdasarkan pemantauan rambang yang dibuat oleh guru-guru di Sekolah Menengah Chong Boon dari masa ke semasa, para pelajar secara umumnya masih belum dapat menguasai kemahiran bertutur lebih-lebih lagi apabila berdepan dengan khalayak. Oleh yang demikian, bangkit satu keperluan bagi guru-guru untuk membina kemahiran bertutur dalam kalangan pelajar. Dalam menyahut seruan Kementerian Pendidikan yang menyokong penyerapan ICT dalam pengajaran, kajian ini dijalankan dengan tujuan khusus melihat perkembangan dan respons para pelajar terhadap penggunaan media baru dalam menggalak mereka membina kemahiran bertutur – lebih spesifik lagi untuk membina motivasi dalam menjawab komponen perbualan berdasarkan gambar bagi kemahiran lisan. Perisian *Newsmaker* telah dipilih berdasarkan ciri-cirinya yang mesra pengguna dan kemampuannya untuk melentur kemahiran menulis, membaca dan membuat penyampaian dalam kalangan pelajar.

### 2. PERNYATAAN MASALAH

Guru-guru mendapati pelajar-pelajar Sekolah Menengah Chong Boon sudah memiliki kemahiran

mengenal pasti isi dalam gambar-gambar yang diperlihatkan dalam kebanyakan sesi latihan dan ujian lisan. Akan tetapi, isi-isi yang diberikan pelajar-pelajar tidak disusun dan disampaikan secara teratur. Hal ini berlaku disebabkan para pelajar ini tidak sedar akan apa yang dipertuturkan sewaktu mereka menjalankan latihan atau ujian bagi komponen perbualan berdasarkan gambar. Justeru, dengan menggunakan perisian *Newsmaker*, para pelajar ini dapat merakam penyampaian mereka. Melalui proses mengulang tayang rakaman yang sama, para pelajar ini dapat mengenal pasti kelebihan atau kekurangan yang wujud dalam penyampaian mereka. Dengan berlakunya proses sebegini, para pelajar berfungsi sebagai pengkritik peribadi dan terdorong untuk memperbaiki penyampaian diri sendiri. Bagi pelajar yang kurang mampu menilai diri sendiri pula, penilaian rakan yang dijalankan pastinya dapat membantu dalam mencapai objektif yang sama. Akan tetapi, Kajian Pengajaran ini hanya akan berjaya seandainya para pelajar sudah didedahkan kepada struktur menyusun isi serta penggunaan rubrik penilaian yang sesuai bagi peringkat pemahaman mereka.

### 3. MATLAMAT KAJIAN

Kajian Pengajaran ini dilaksanakan berdasarkan tujuan yang berikut :

1. Pelajar dapat merakam pertuturan ayat-ayat yang gramatis menggunakan sebutan yang baku dengan berkesan.
2. Keberkesanan penggunaan News Maker dalam menggalak pelajar untuk bersikap lebih yakin semasa berbual di khalayak dapat berkomunikasi

dengan lancar dan sudi menyumbang pendapat ketika menjalani penilaian sendiri dan penilaian rakan melalui proses mengulang tayang rakaman.

#### 4. KAJIAN LITERATUR

##### Kajian Pengajaran

Kajian Pengajaran merupakan kaedah yang dipilih untuk memperbaiki kemahiran bertutur para pelajar di sekolah kami. Kajian Pengajaran dipilih oleh kami kerana menurut Stepanek Jennifer (2007), apabila kajian pengajaran dijalankan di peringkat sekolah peningkatan berterusan akan berlaku di lebih daripada satu bilik darjah. Malah, kajian pengajaran juga membantu para pelajar untuk memahami bagaimana tindakan mereka menyumbang kepada pembelajaran pelajar. Menerusi kaedah ini peranan guru turut berubah. Kini, guru dianggap sebagai penyampai, pemudah cara dan perancang pengajaran. Guru juga memperolehi pengalaman pembelajaran yang kongruent dengan perkembangan profesional yang berkesan. Stepanek Jennifer (2007) juga mengatakan kaedah ini juga berbentuk kolaboratif, menyeluruh dan berterusan bertumpu pada bahan subjek, dipandu oleh guru dan menekankan pembelajaran di kelas yang berbentuk aktif dan autentik yang tertumpu pada hasil pembelajaran pelajar. Kajian Pengajaran juga berlandaskan refleksi. Refleksi ini akan memastikan pembelajaran mendalam dan perubahan yang bererti berlaku selepas proses ini. Menurut Lewis (2002), bagi para guru, refleksi membantu mereka untuk mempertimbangkan apa yang telah dilaksanakan dengan lancar dan perubahan yang harus dilakukan untuk memperbaiki kitaran yang seterusnya.

##### Pembelajaran Berpusatkan Pelajar

Beberapa dekad yang lalu pembelajaran pelajar berpusatkan guru tetapi hari ini pembelajaran berpusatkan pelajar pula. Kami merancang untuk mengendalikan pengajaran berpusatkan pelajar agar pelajar kami dapat memperolehi manfaat daripada kaedah pengajaran ini. Fokus pembelajaran berpusatkan pelajar mewujudkan pengalaman pembelajaran yang dapat menarik minat pelajar serta melibatkan mereka dalam pembelajaran. Menurut Quek Choon Lang (2008), pembelajaran berpusatkan pelajar juga memberi pelajar kebebasan membuat pilihan tentang bahan dan aktiviti pembelajaran. Peranan guru pula adalah untuk melibatkan pelajar dalam pelbagai jenis aktiviti pembelajaran.

##### Kemahiran Bertutur

Memandangkan bahawa kemahiran bertutur merupakan komponen yang penting dalam pembelajaran bahasa di Singapura maka usaha harus

diambil untuk mempertingkatkan kemahiran ini dalam kalangan pelajar. Bertutur atau bercakap merupakan kemahiran lisan yang penting dalam situasi formal atau tidak formal. Dr Abbas (2006) telah menyatakan bahawa guru harus mengajar pelajar kemahiran bertutur supaya pelajar boleh menyampaikan maklumat, pendapat, perasaan serta idea yang kritis yang kreatif secara lisan dengan menggunakan bahasa yang gramatis dan sopan. Kemahiran bertutur ditekankan dalam proses kajian kami kerana pelajar kami perlu menerangkan gambar yang diberi dengan mengemukakan pendapat dan perasaan mereka.

##### Penilaian Rakan Sebaya Berpandukan Rubrik

Penilaian rakan sebaya semakin luas digunakan di bilik darjah. Penilaian ini berbentuk formatif. Penilaian formatif bertanggungjawab untuk memberitahu guru dan pelajar tentang pemahaman pelajar. Menurut Chai Ching Sing dan Wang QiYun(2010) menerusi penilaian rakan pelajar melihat diri masing-masing sebagai sumber bagi pemahaman dan memeriksa untuk kerja berkualiti dibandingkan dengan kriteria yang wujud sebelum ini. Penggunaan rubrik dalam penilaian membantu guru untuk fokus terhadap kriteria pembelajaran yang akan dinilai. Brookhart Susan M(2013) menganggap rubrik penting kerana ia menjelaskan kepada pelajar kualiti yang harus dimiliki oleh tugas mereka. Rubrik juga membantu guru untuk mengajar, mengkoordinasi arahan dan penilaian serta membantu pelajar untuk belajar. Oleh itu dalam kajian ini kami menggunakan kaedah penilaian rakan sebaya berpandukan rubrik untuk meningkatkan mutu pembelajaran pelajar.

##### Penggunaan ICT dalam Membina Kemahiran Bertutur

Kementerian Pendidikan Singapura menggalakkan penggunaan teknologi maklumat dan komunikasi (ICT) untuk memperkaya pembelajaran pelajar terutama sekali dalam pembelajaran bahasa ibunda. Lanjutan daripada itu, ramai guru mendapati ICT merupakan alat yang berkesan dalam pengajaran. Menyedari hakikat ini, para guru diberikan peluang untuk memilih alat yang bersesuaian dengan kurikulum atau untuk menyokong sesuatu pendekatan pengajaran dan pembelajaran. Penggunaan ICT sebagai alat untuk mengajar kemahiran bertutur atau komunikasi membantu melaksanakan pembelajaran kolaboratif, meningkatkan penglibatan pelajar dalam pembelajaran secara kumpulan yang bersifat global. Dengan menggunakan ICT dalam pengajaran, pelajar dapat mengindividukan pembelajaran, belajar mengikut kemampuan sendiri, meningkatkan

motivasi dan belajar dengan penyeliaan yang minimum. Oleh hal yang demikian, guru, kini menghadapi cabaran untuk menyediakan pengajaran yang berkesan dan cekap. Namun, tidak dapat dinafikan minat dan kecenderungan pelajar terhadap ICT menjadi daya tarikan kepada pelajar untuk mengikuti pengajaran guru terutama sekali jika ia mengandungi unsur hiburan seperti perisian 'newsmaker'.

## 5. KAEDAH KAJIAN

Reka bentuk kajian ini ialah kajian pengajaran meninjau penggunaan perisian newsmaker untuk meningkatkan pencapaian pelajar dalam Bahasa Melayu bahagian lisan perbualan komponen penerangan gambar. Kajian ini menggunakan kaedah kuantitatif dan kualitatif untuk mendapatkan data kajian. Perisian *Newsmaker* ini dipilih kerana memiliki ciri-ciri unik yang dapat menyuntik unsur hiburan dalam proses pembelajaran. Pelajar diberi pilihan untuk menggunakan ikon-ikon beranimasi untuk disertakan bersama dalam rakaman mereka. Dengan adanya unsur sebegini, para pelajar tidak terikat dengan cara pembelajaran kemahiran bertutur yang konvensional yang lazimnya mendatangkan kebosanan hanya kerana proses yang sama berulang setiap masa. Penggunaan perisian *Newsmaker* diharapkan dapat memberikan kesegaran pada proses pembelajaran dan pada masa yang sama dapat meningkatkan minat dan motivasi pelajar untuk turut serta dalam latihan perbualan lisan. Tambahan pula, penggunaan perisian ini dirasakan serasi dengan kegiatan semasa para pelajar sekarang yang selesa menonton atau merakam *Vlog* (blog dalam rakaman) di alam siber. Penilaian sendiri dan penilaian rakan juga dititikberatkan kerana para guru ingin menggalakkan pelajar supaya berdikari dalam proses meraih ilmu. Proses ini, jika dipraktikkan secara berulang dalam masa pembelajaran, akan menjadi satu amalan atau tabiat positif dalam kalangan pelajar apabila membuat ulang kaji secara bersendiri.

### Subjek Kajian

Sampel kajian terdiri daripada pelajar daripada kelas menengah 3 Ekspres dan pelajar dari kelas menengah 3 Normal Akademik dari Sekolah Menengah Chong Boon. Bagi pihak guru, tiga orang guru Bahasa Melayu yang terlibat. Seorang guru pemantau dan dua orang guru yang mengajar semasa kitaran pertama dan dua.

### Instrumen Kajian

Memandangkan kajian ini menggunakan reka bentuk penyelidikan kajian pengajaran yang menggunakan kaedah kuantitatif dan kualitatif, pengkaji akan menggunakan pelbagai instrumen yang boleh menyokong kajian ini. Instrumen kajian ini terdiri

daripada pemerhatian guru-guru, keputusan peperiksaan semestral pertama (SA1) dan peperiksaan semestral dua (SA2), (ujian pra dan ujian pasca), persediaan mengajar, borang penilaian (rubrik), dialog antara guru dan pelajar (aktiviti pasca) dan refleksi guru-guru dan pelajar-pelajar.

### Pengumpulan Data

Sebelum pengajaran menggunakan perisian *newsmaker* dilaksanakan, pelajar-pelajar akan diberikan ujian pencapaian dalam komponen lisan perbualan bergambar iaitu ujian pra. Tujuan ujian ini adalah untuk mengetahui tahap pencapaian awal pelajar sebelum kajian dijalankan. Pada minggu ke lapan, pelajar-pelajar akan diberikan ujian pasca untuk melihat sama ada terdapat peningkatan pencapaian selepas pengajaran perisian *newsmaker* dilaksanakan dan soal selidik berkaitan tentang tahap penerimaan pelajar terhadap penggunaan peta konsep dalam proses pengajaran dan pembelajaran komponen lisan penerangan bergambar. Para pelajar juga diminta membuat refleksi tentang pembelajaran mereka untuk mendapatkan maklum balas tentang pengajaran menggunakan *perisian newsmaker*.

### Prosedur Kajian

Kajian Pengajaran yang dijalankan melalui dua proses kitaran kajian. Kitaran kajian pertama dijalankan pada 11 Julai 2012. Cikgu Sri Nabilah Basri merupakan guru pelaksana bagi Pengajaran Kajian ini. Dalam pengajaran yang pertama, kajian melibatkan pelajar-pelajar menengah 3 Ekspres. Bagi kitaran kajian yang kedua pula dilaksanakan pada 18 Julai oleh Cikgu Uma Thiruselvam. Kali ini melibatkan pelajar-pelajar 3 Normal Akademik.

Proses pembelajaran ini memuatkan Rancangan Pengajaran Kajian Kitaran 1 dan Kitaran 2. Setiap rancangan pengajaran telah dibincangkan oleh kumpulan kajian pengajaran bagi memastikan pembaikan dilakukan demi menyediakan pengalaman pembelajaran yang menarik, bermakna dan berkesan dalam meningkatkan pengalaman pembelajaran pelajar.

Dalam kitaran kajian yang pertama (kelas 3 Ekspres) guru menayangkan tiga gambar dan meminta respons pelajar berdasarkan beberapa soalan rangsangan. Kemudian, guru memperkenalkan pendekatan L.A.P (lihat, andaian, pandangan) kepada pelajar untuk menyusun isi-isi perbincangan mereka dalam penyusun grafik yang telah disediakan. Pelajar dikehendaki merakam isi yang telah dicatatkan dalam lembaran menggunakan perisian *Newsmaker*. Pelajar boleh menggunakan ikon-ikon yang telah tersedia untuk menambah nilai rakaman penyampaian mereka. Seterusnya pelajar harus mengulang tayang rakaman tersebut dan menilai pencapaian mereka berpandukan rubrik. Kemudian, guru akan

memberikan arahan kepada pelajar untuk bergerak mengikut putaran jam untuk menilai kerja rakan mereka secara kualitatif dan kuantitatif. Borang rubrik yang telah diterap akan dipulangkan kepada pemilik rakaman untuk melihat tahap yang mereka telah capai. Sebagai langkah penutup pelajar digalakkan berkongsi pandangan dan penilaian mereka terhadap prestasi yang ditunjukkan semasa latihan dikendalikan. Pelajar telah menilai rakan mereka dengan jujur dan saksama. Pelajar juga diminta merumuskan pelajaran untuk memastikan objektif asal pelajaran telah dicapai. Semasa langkah terakhir ini guru dalam interaksinya dengan pelajar diberitahu oleh pelajar mereka dapat memperolehi manfaat daripada penggunaan perisian ini.

Dalam kitaran yang kedua guru (bagi kelas 3 Normal Akademik) menayangkan 3 gambar yang berbeza bersertakan dengan senarai kosa kata yang dapat membantu pelajar memberikan respons kepada soalan-soalan rangsangan guru.

Pelajar kemudian diberikan penyusun grafik dan dikehendaki menghasilkan 8 hingga sepuluh ayat yang gramatis berdasarkan gambar yang diberikan menggunakan kaedah L.A.P. Seterusnya pelajar diminta secara bergilir untuk merakamkan isi yang telah mereka catatkan itu. Seperti di dalam kitaran yang sebelumnya pelajar juga digalakkan menggunakan ikon-ikon yang telah disediakan untuk menambahkan mutu kepada penyampaian mereka. Kemudian pelajar diminta menilai rakan mereka dan berkongsi dengan kelas penilaian mereka. Namun,

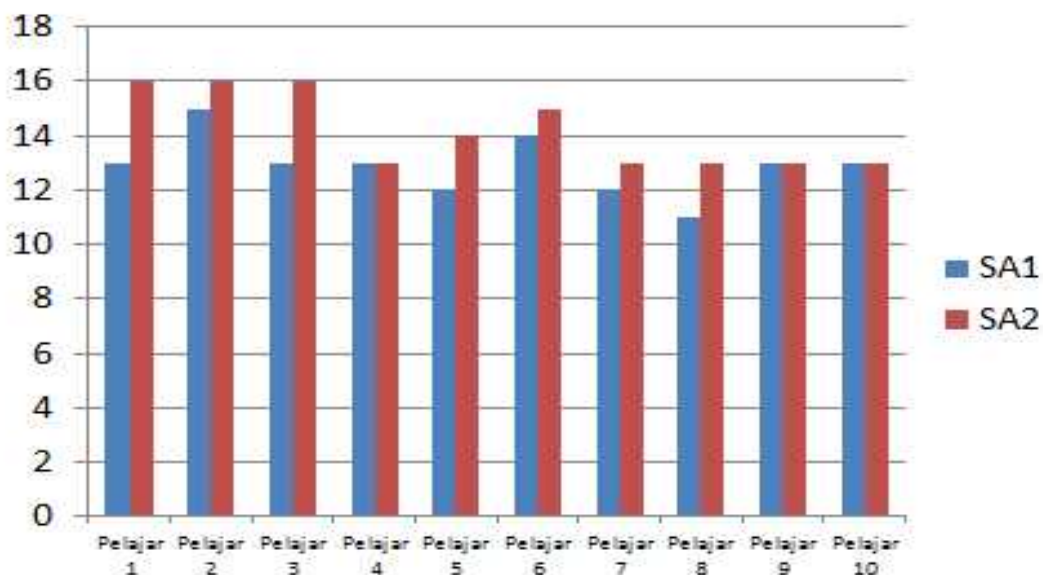
bahagian ini tidak dapat dijalankan dengan berkesan bagi kelas ini kerana ada pelajar yang tidak memahami kriteria rubrik dan tidak dapat melakukan penilaian yang baik. Ada juga pelajar yang bersikap was-was untuk mengemukakan komen mereka dan memberikan markah yang tinggi kepada rakan mereka. Sungguhpun begitu, secara keseluruhan ramai pelajar yang telah menilai rakan mereka secara jujur dan adil. Pelajar juga mengatakan bahawa mereka terhibur menjalani proses melatih kemahiran bertutur dengan menggunakan perisian ini. Mereka juga gembira kerana dapat bekerjasama dengan rakan untuk memperbaiki kemahiran bertutur secara keseluruhannya.

## 6. DAPATAN KAJIAN

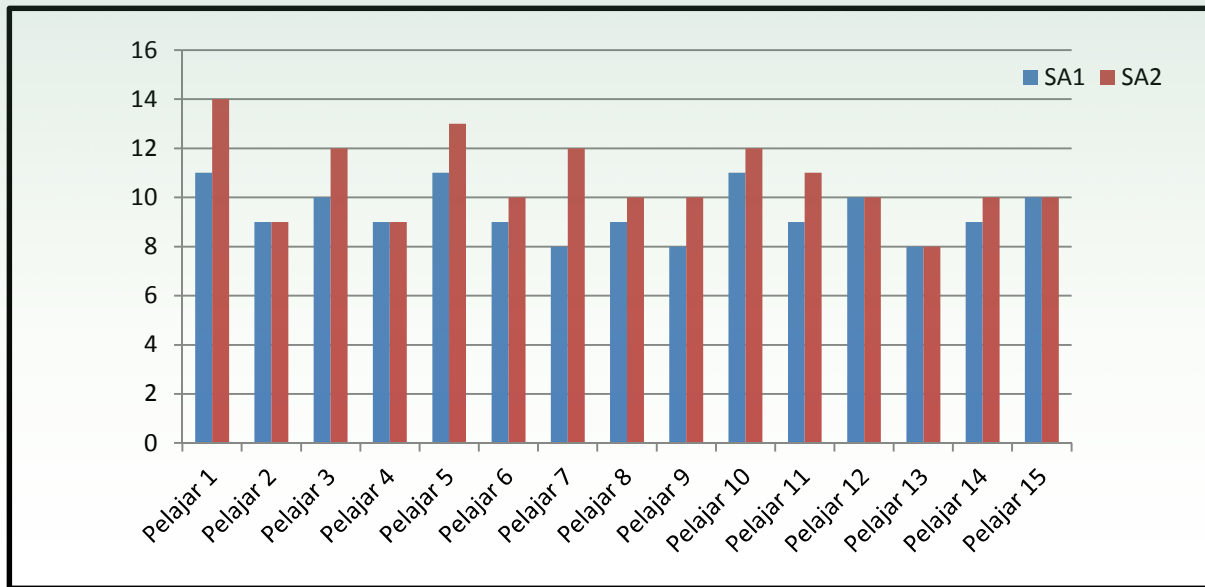
### Dapatan Kuantitatif

Setelah menjalankan Kajian Pengajaran ini sebanyak dua kitaran, persembahan pelajar diukur lagi sewaktu peperiksaan lisan pada akhir tahun. Berdasarkan markah yang diperoleh para pelajar, nyatalah bahawa matlamat yang ingin dicapai untuk komponen Perbualan Berdasarkan Gambar melalui Kajian Pengajaran ini berjaya diraih. 100% daripada pelajar menengah 3 Ekspres telah meraih markah yang lebih baik bagi Peperiksaan Akhir Tahun (SA2) berbanding Peperiksaan Pertengahan Tahun (SA1). 70% daripada para pelajar 3 Normal Akademik juga menunjukkan kemajuan, manakala yang selebihnya kekal dengan markah yang sama.

Jadual 1: Markah bagi Komponen Perbualan Bergambar Menengah 3 Ekspres



Jadual 2: Markah bagi Komponen Perbualan Bergambar Menengah 3 Normal Akademik



### Dapatan Kualitatif

Berdasarkan pemantauan yang dilakukan, guru-guru mendapati pelajar-pelajar yang mengikuti Pengajaran Kajian ini dapat meraih manfaat yang dapat membina kemahiran bertutur mereka. Setelah menonton penyampaian pelajar yang dirakam dengan menggunakan perisian *Newsmaker*, pelajar dapat memberikan komen secara bertulis dan menilai penyampaian rakan dengan memberikan markah. Pelajar-pelajar juga dapat bertukar-tukar pandangan dan yang penting sekali adalah kesediaan pelajar menerima teguran rakan-rakan dalam usaha mempertingkatkan penyampaian yang dilakukan.

Pemantauan guru juga mendapati pelajar dapat memperbaiki penggunaan bahasa dan juga sebutan baku. Di samping itu, pelajar dapat mengenali kekuatan dan kelemahan secara individu. Ada juga pelajar yang dapat merasakan bagaimana pengalman bertugas sebagai seorang pembaca berita baik di radio ataupun di televisyen. Namun, impak yang positif adalah, pelajar berasa lebih yakin untuk menduduki ujian lisan yang akan dijalani. Berikut adalah pandangan dan refleksi pelajar setelah mengikuti kajian pengajaran.

#### Pelajar 1

Pengajaran tersebut telah membantu saya memperbaiki cara penyampaian saya dalam bahasa dan sebutan baku. Pada masa yang sama, saya dapat rasakan apa yang para pemberita lazim lalui.

(Nur Ain, Pelajar Menengah 3 Normal Akademik)

#### Pelajar 2

Saya dapat mengenali kelebihan dan kelemahan saya sendiri apabila mengulang tayang rakaman yang

telah saya sediakan. Saya menjadi semakin yakin untuk menduduki peperiksaan lisan.

(Nor Tahiyatulfiqqah, Pelajar Menengah 3 Ekspres)

### Guru Pengkaji

Kajian ini memberikan pengalaman yang baharu kepada setiap anggota. Guru berasa lebih bersemangat terutama sekali apabila dapat mempelajari daripada satu dengan yang lain. Biarpun anggota pasukan terdiri daripada guru-guru yang mempunyai pengalaman mengajar yang berbeza-beza, perbezaan ini tidak dirasakan kerana setiap guru dapat menyerlahkan pengalaman peribadi yang pelbagai semasa memantau. Proses pencerahan (refleksi) yang dialami guru menjadi kekuatan Kajian Pengajaran ini. Berikut adalah antara sedutan daripada refleksi guru mengenai kajian pengajaran yang mereka jalankan.

Setelah melalui proses Kajian Pengajaran ini, saya lebih bersemangat untuk mengajar kerana semasa menghasilkan pakej bersama, saya dapat mempelajari perkara baharu daripada rakan-rakan setugas saya. Pelajar juga kelihatan lebih yakin untuk membuat penyampaian lisan mereka.

-Cikgu Uma Thiruselvam

Kitaran pertama berjaya dijalankan dengan lancar kerana para pelajar yang terlibat secara umumnya mempunyai kemahiran bahasa yang tinggi. Namun, melalui perbincangan bersama para guru yang lain dan setelah menganalisis profil pelajar yang bakal terlibat dalam kitaran yang kedua, kami sedar tentang peri pentingnya menerapkan pengajaran pembezaan agar kelompok pelajar yang lebih lemah ini dapat meraih manfaat daripada pelajaran yang sama.

- Cikgu Sri Nabilah

### Guru Pemantau 1

Pelajar kelihatan lebih terangsang untuk mengambil bahagian dalam latihan membina kemahiran bertutur. Mereka juga mencerminkan kemampuan untuk mengekspresikan kreativiti melalui penggunaan perisian Newsmaker. Dalam masa yang sama, pelajar mempamerkan kebolehan menilai persembahan mereka sendiri di samping memperbaiki segala kelemahan secara sendiri.

- Cikgu Rohaizat

## 7. PERBINCANGAN

Kumpulan kajian pengajaran melakukan pemerhatian dan pemantauan setiap pelaksanaan pengajaran kajian yang dijalankan. Antara dapatan yang diperoleh daripada pemerhatian dan pemantauan yang dijalankan, guru mendapati bahawa penerimaan dan proses pembelajaran yang dilalui oleh pelajar Ekspres dan Normal Akademik berbeza. Misalnya pada bahagian induksi, para pelajar Normal Akademik masih memerlukan bantuan untuk memahami konsep LAP berbanding para pelajar Ekspres.

Berikut adalah saranan dan dapatan yang diberikan bagi setiap pengajaran kajian yang dilaksanakan.

### Pelajar 3 Ekspres

Secara umumnya, pelajar memahami soalan guru dan dapat menjawabnya dengan tepat. Akan tetapi, pelajar yang berkeupayaan sederhana mengambil masa lebih lama untuk berkongsi pandangan mereka secara spontan. Mereka mungkin sudah membentuk gambaran dalam minda tentang apa yang ingin dikatakan, namun, dihalang oleh kekurangan dalam aspek kemahiran berbahasa – iaitu kurang yakin memilih perkataan yang tepat untuk diekspresikan. Sehubungan itu, para pelajar menengah 3 Normal Akademik perlu dibantu dengan menyediakan senarai kata kunci yang merangkumi jenis-jenis kata nama, kata kerja dan kata adjektif yang relevan bagi setiap gambar.

Guru-guru mengenal pasti, pelajar yang lebih cemerlang tidak mempunyai masalah menulis ayat-ayat kompleks dalam mengekspresikan idea mereka. Namun, pelajar yang sederhana mungkin akan mengambil masa yang lebih panjang untuk melengkapkan latihan yang sama. Oleh itu, bagi kitaran kajian pengajaran yang kedua, arahan yang diberikan kepada pelajar boleh dibezakan. Pelajar dalam peringkat sederhana dan lemah perlu digalakkan menggunakan ayat-ayat ringkas. Akan tetapi, mereka perlu diingatkan tentang kesinambungan daripada satu ayat kepada ayat yang lain dan ini boleh dilakukan dengan menggunakan penanda wacana yang tepat.

Para pelajar tidak mengalami sebarang masalah. Mereka mampu menggunakan perisian ini dengan baik. Mereka juga kelihatan tenang sewaktu membuat rakaman. Ini mungkin disebabkan oleh jumlah pelajar yang kecil bagi kelas ini. Namun, bagi kelas 3 Normal Akademik, jumlah pelajar lebih ramai. Justeru, segelintir pelajar (khususnya yang lemah) pasti akan rasa ragu-ragu untuk menjalankan latihan ini kerana khuatir mereka tidak dapat menyampaikan tugas ini dengan baik. Dalam hal ini, para pelajar perlu dipasangkan dengan adil, di mana pelajar yang lemah atau sederhana akan dipasangkan dengan pelajar yang cemerlang agar mereka boleh saling bantu-membantu sewaktu menjalankan proses rakaman.

Penilaian rakan dijalankan dengan baik. Para pelajar jujur dalam memberikan markah serta penilaian bertulis. Para pelajar yang menerima komen juga bersikap terbuka dalam menerima teguran. Hal ini menunjukkan sumbangan yang positif. Maka, perlu dilaksanakan juga dalam pembelajaran bersama kelas 3 Normal Akademik.

Melalui dialog ringkas antara guru dengan pelajar, jelas bahawa para pelajar 3 Ekspres telah memahami segala latihan yang mereka laksanakan bagi pelajaran ini. Melalui maklum balas daripada mereka juga, latihan menggunakan perisian Newsmaker ini telah memanfaatkan diri masing-masing. Guru boleh menggunakan strategi yang sama untuk menutup pelajaran bagi kitaran kajian pengajaran yang kedua.

### Pelajar Menengah 3 Normal Akademik

Guru-guru mendapati, dengan senarai bantuan yang disediakan, pelajar lebih mudah mengekspresikan idea-idea mereka secara lisan. Penerapan teknik pembezaan ini telah berjaya membantu para pelajar yang lemah dan sederhana untuk membina jawapan-jawapan yang hampir setara dengan jawapan yang dibina oleh para pelajar yang cemerlang. Akan tetapi, masih terdapat seorang dua pelajar yang masih memerlukan sokongan tambahan. Ini kerana pelajar-pelajar ini masih lemah dalam kemahiran-kemahiran yang asas seperti membentuk ayat dan sebagainya. Pelajar-pelajar sebegini perlu diberikan lebih masa untuk menggarap kemahiran untuk bertutur secara spontan.

Para pelajar daripada kelompok yang cemerlang dapat melaksanakan tugas ini dengan baik. Bagi seorang dua pelajar yang lemah pula, mereka masih lemah dalam membentuk ayat-ayat yang baik. Pelajar-pelajar ini perlu diberikan sokongan tambahan pada luar waktu pelajar agar kekurangan mereka dalam kemahiran-kemahiran asas (seperti menulis) tidak akan menghalang mereka daripada berpartisipasi dengan sepenuhnya dalam latihan-latihan yang dijalankan di dalam kelas.



Secara umumnya, semua pelajar dapat menjalankan tugas ini dengan baik, termasuk pelajar daripada kelompok lemah dan sederhana. Namun, strategi berpasangan dan bergilir-gilir menggunakan komputer riba telah memakan banyak masa. Pada masa akan datang, guru mungkin ingin mempertimbangkan penggunaan satu komputer riba bagi setiap pelajar agar masa pembelajaran terkawal.

Segelintir pelajar masih ragu-ragu memberi komen kepada rakan. Oleh itu, markah yang diberikan kepada rakan mereka agak tinggi. Kemungkinan juga pelajar-pelajar ini masih tidak faham kandungan dalam rubrik yang diberikan, maka tidak dapat menyampaikan penilaian dengan baik juga. Namun, secara keseluruhan, ramai pelajar yang berjaya menilai rakan yang lain secara jujur, adil dan saksama. Komen-komen yang mereka utarakan juga relevan seperti yang berikut:

'Kamu kelihatan kurang yakin kerana suara kamu sangat perlahan.'

'Syabas! Penyampaian kamu sangat tenang dan isi-isi kamu baik.'

Melalui dialog ringkas antara guru dengan pelajar, jelas bahawa para pelajar terhibur menjalani proses melatih kemahiran bertutur menggunakan perisian Newsmaker ini. Pada masa yang sama, mereka juga gembira kerana dapat bekerjasama dengan rakan untuk memperbaiki kemahiran bertutur secara umumnya. Secara umumnya, kajian pengajaran ini telah mencapai objektifnya kerana jelas kelihatan minat dan keghairahan para pelajar sewaktu pembelajaran dijalankan.

## Rumusan

Kajian Pengajaran yang dijalankan menunjukkan peningkatan yang memuaskan dalam pencapaian para pelajar. Para pelajar telah membuktikan bahawa dengan pendedahan kepada sofwe *newsmaker* mereka dapat menguasai perasaan malu mereka ketika berbual. Guru-guru yang menyertai Kajian Pengajaran ini telah berjaya menyuntikkan para pelajar dengan semangat ingin mencuba walaupun mereka menghadapi masalah untuk menyuarakan pandangan mereka. Kaedah pengajaran yang menarik dan bukan berbentuk linear yang digunakan oleh guru telah merangsang pelajar untuk terus mencuba dan meningkatkan pencapaian mereka. Suasana pembelajaran yang lebih menyeronokkan membantu pelajar untuk menguasai kemahiran lisan dengan lebih mudah. Peranan guru sebagai fasilitator juga dapat membantu pelajar yang lemah untuk mengikuti aktiviti yang disediakan dengan mudah. Malah, sumbangan rakan-rakan dalam usaha menilai dan memberikan komen-komen yang membina telah menyebabkan pelajar berfikir kritis dan menyedari harapan tinggi guru mengenai persembahan mereka.

Pendekatan yang diambil oleh guru telah membungakan hasil yang diharapkan.

## 8. KESIMPULAN

Dalam kitaran yang pertama menerusi pemantauan para guru didapati pelajar mengambil masa untuk mengemukakan pendapat dan memperkembangkan idea mereka secara bertulis. Ada di antara mereka juga menanya guru perkataan yang sesuai digunakan untuk menggambarkan keadaan. Oleh kerana, kelas ini merupakan kelas di mana pelajar-pelajarnya lebih cerdas maka guru-guru dalam perbincangan mereka bersetuju untuk mengubah rancangan pengajaran untuk kelas 3 Normal Akademik. Oleh itu, kelas 3 Normal Akademik disediakan dengan senarai kosa kata untuk membantu pelajar dari kelas tersebut semasa menjalani aktiviti ini. Proses penilaian sendiri merupakan langkah tambahan untuk kelas 3 Ekspres. Menerusi langkah ini guru-guru dapat melihat kesungguhan dan tanggungjawab pelajar terhadap pembelajaran mereka. Sikap belajar secara sendiri dan kemahiran berkomunikasi inilah yang ingin dilihat dalam diri pelajar, sesuai dengan kemahiran abad ke-21.

Dalam kitaran yang kedua guru-guru mendapati pelajar-pelajar dari kelas 3 Normal Akademik bersifat begitu teruja sekali untuk menggunakan perisian *newsmaker* dalam membina kemahiran bertutur mereka tetapi ada beberapa pelajar yang lemah dan memerlukan bantuan tambahan dari segi penulisan dan penyampaian. Namun suasana pembelajaran di dalam kelas ini begitu meriah sekali kerana unsur humor dalam perisian ini menarik minat belajar untuk mencuba serta meneruskan rakaman mereka. Suasana pembelajaran yang tidak mengancam begini memberikan pelajar motivasi untuk meningkatkan pencapaian mereka dan membina keyakinan mereka untuk menilai rakan-rakan mereka. Pelajar-pelajar juga dapat mempelajari cara-cara untuk mempertingkatkan penyampaian mereka menerusi proses menilai rakan berpandukan rubrik. Rubrik penilaian pula telah memberikan pelajar gambaran akan tahap yang harus mereka capai. Secara keseluruhannya, perisian *newsmaker* ini telah membantu pelajar-pelajar untuk meningkatkan kemahiran bertutur mereka dan memberikan keyakinan diri kepada pelajar-pelajar.

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**PROSES PEMBELAJARAN KAJIAN**  
**Rancangan Pengajaran Kajian Kitaran 1**  
**Matlamat Pengajaran**

Pelajar dapat:

1. Menggunakan pendekatan berstruktur L.A.P untuk menghuraikan isi
2. Menggunakan ayat-ayat yang lengkap dan gramatis serta sebutan baku untuk menghuraikan isi.

Aktiviti Pembelajaran dan Soalan-soalan Guru		Reaksi pelajar yang dijangkakan	Sokongan guru (soalan susulan sebagai panduan terhadap pembelajaran pelajar)	Penilaian Bagaimanakah penilaian dilakukan? Apakah wahana ( <i>tools</i> ) yang digunakan?
Masa	Aktiviti			
5 minit	<p><b>Induksi</b></p> <p>Guru mencungkil pengetahuan sedia ada pelajar. Pelajar dikehendaki menghuraikan mnemonik L.A.P. berdasarkan slaid PPT yang ditayangkan oleh guru.</p> <p>Strategi: Rally Robin</p> <p>Berdasarkan jawapan pelajar, guru akan merangkumkan objektif bagi pembelajaran ini dengan menayangkan slaid ‘Objektif Pembelajaran’ kepada para pelajar.</p>	<p>Pelajar boleh menjawab soalan guru berpandukan pengetahuan sedia ada yang dimiliki.</p> <p>Ini kerana penggunaan pendekatan L.A.P. telah dijadikan satu rutin dalam latihan-latihan lisan sebelum ini.</p> <p>Pelajar cuba memikirkan antara objektif yang ingin dicapai untuk pelajaran ini.</p>	<p>Apakah yang dimaksudkan dengan huruf ‘L’, ‘A’ dan ‘P’ dalam mnemonik ini?</p> <p><b>L</b> – Apakah yang kamu LIHAT?</p> <p><b>A</b> – Apakah ANDAIAN kamu berkenaan apa yang kamu lihat?</p> <p><b>P</b> – Apakah PANDANGAN PERIBADI kamu berkenaan hal yang berlaku ini?</p> <p>Apakah tujuan kita menggunakan mnemonik ini?</p>	<p>Slaid pembentangan <i>Powerpoint</i></p> <p>Penilaian Informal (Berdasarkan jawapan sumbangan pelajar.)</p>

Aktiviti Pembelajaran dan Soalan-soalan Guru		Reaksi pelajar yang dijangkakan	Sokongan guru (soalan susulan sebagai panduan terhadap pembelajaran pelajar)	Penilaian Bagaimanakah penilaian dilakukan? Apakah wahana ( <i>tools</i> ) yang digunakan?
Masa	Aktiviti			
10 minit	<p><b>Langkah 1</b></p> <p>Guru menayangkan gambar yang pertama. Pelajar dikehendaki mengenal pasti isi-isi penting yang perlu diuraikan dan memberikan respons mereka secara lisan.</p> <p><b>Lihat gambar-gambar berikut dan fikirkan fokus utama yang boleh diperbuatkan.</b></p> <p>Guru menayangkan pula gambar kedua dan perlu mendapatkan respons yang serupa daripada pelajar.</p> <p>Guru menayangkan gambar terakhir dan pelajar dikehendaki memberikan respons berkaitan gambar tersebut juga.</p>	<p>Setiap pelajar dapat menyumbang satu isi.</p> <p>Sekurang-kurangnya tiga isi penting dapat dikongsi secara lisan bagi setiap satu gambar.</p> <p>Apabila pelajar mengalami masalah mencari isi utama, guru boleh mengajukan soalan-soalan rangsangan bagi membantu pelajar membentuk isi-isi utama tersebut.</p>	<p><u>Soalan rangsangan bagi Gambar 1</u></p> <p><i>Apakah aktiviti-aktiviti utama yang kamu lihat berlaku dalam gambar ini?</i></p> <p><i>Apakah yang dilakukan pelajar lelaki di bahagian kanan/ tengah gambar ini? Mengapakah dia melakukan hal demikian?</i></p> <p><i>Apakah yang berlaku kepada pelajar di bahagian kiri gambar ini? Mengapakah hal ini berlaku kepadanya?</i></p> <p><u>Soalan rangsangan bagi Gambar 2</u></p> <p><i>Siapakah orang-orang di dalam gambar ini? Apakah yang mereka lakukan?</i></p> <p><i>Mengapakah mereka berada di tempat ini?</i></p>	<p>3 gambar yang berbeza</p> <p>Slaid Persembahan</p>

Aktiviti Pembelajaran dan Soalan-soalan Guru		Reaksi pelajar yang dijangkakan	Sokongan guru (soalan susulan sebagai panduan terhadap pembelajaran pelajar)	Penilaian Bagaimanakah penilaian dilakukan? Apakah wahana ( <i>tools</i> ) yang digunakan?
Masa	Aktiviti			
			<p><i>Mengapakah mereka melakukan aktiviti ini?</i></p> <p><i>Soalan rangsangan bagi Gambar 3</i></p> <p><i>Apakah yang dilakukan oleh tiga pelajar ini?</i></p> <p><i>Apakah kesan daripada perbuatan mereka ini?</i></p>	
10 minit	<p><b>Langkah 2</b></p> <p>Guru mengedarkan lembaran penyusun grafik L.A.P kepada setiap pelajar.</p> <p>Setiap pelajar akan ditugaskan meneliti satu daripada tiga gambar yang ditayangkan awal tadi.</p> <p>Secara individu, pelajar dikehendaki menyusun isi-isi yang telah mereka bincangkan menggunakan pendekatan berstruktur L.A.P.</p> <p><b>Isi lembaran yang diberikan dengan huraian yang sesuai.</b></p>	<p>Pelajar akan menggunakan isi yang telah dibincangkan secara sepintas lalu untuk dikembang dan digabungkan menggunakan ayat yang gramatis.</p> <p>Pelajar yang cemerlang dibolehkan menulis isi dalam bentuk butiran sahaja. Manakala, pelajar yang sederhana dikehendaki menulis ayat yang penuh.</p>	<p>Guru boleh memberi panduan kepada pelajar dengan menekankan keperipentingan proses berfikir menggunakan pendekatan berstruktur L.A.P.</p> <p><i>Apakah perkara utama yang kamu lihat?</i></p> <p><i>Mengapakah hal ini berlaku?</i></p> <p><i>Apakah yang mungkin menyebabkan hal ini berlaku?</i></p> <p><i>Adakah perkara yang berlaku ini sesuatu yang baik atau</i></p>	<p>Penyusun Grafik L.A.P.</p> <p>3 gambar dalam bentuk salinan keras – 1 gambar bagi setiap gambar</p>

Aktiviti Pembelajaran dan Soalan-soalan Guru		Reaksi pelajar yang dijangkakan	Sokongan guru (soalan susulan sebagai panduan terhadap pembelajaran pelajar)	Penilaian Bagaimanakah penilaian dilakukan? Apakah wahana ( <i>tools</i> ) yang digunakan?
Masa	Aktiviti			
		Sekitar 5 baris ayat diperlukan.	<i>sebaliknya?</i> <i>Adakah ia perlu digalak atau dielak?</i>	
15 minit	<p><b>Langkah 3</b></p> <p>Pelajar dikehendaki merakam isi yang telah dicatatkan dalam lembaran menggunakan perisian <i>Newsmaker</i>.</p> <p>Pelajar boleh menggunakan ikon animasi yang tersedia di dalam perisian tersebut untuk menambah nilai rakaman penyampaian mereka.</p> <p>Seandainya pelajar mempunyai lebih masa, pelajar perlu mengulang tayang rakaman sendiri dan menilai penyampaian sendiri dengan berpandukan rubrik yang disediakan oleh guru.</p> <p>Kemudian, pelajar boleh merakam semula penyampaian mereka jika masa mengizinkan.</p>	<p>Pelajar akan merakamkan isi-isi yang telah dicatat pada penyusun grafik masing-masing menggunakan sebutan baku.</p> <p>Antara masalah yang mungkin timbul ialah pelajar akan ‘melambatkan’ proses memulakan rakaman kerana malu atau risau mereka akan menarik perhatian rakan-rakan yang lain.</p>	<p>Guru perlu memastikan jarak antara tempat duduk pelajar cukup selesa agar pelajar tidak terjejas sewaktu ingin membuat rakaman.</p> <p>Peranan guru hanya memantau. Namun, seandainya pelajar bermasalah mengendalikan perisian <i>Newsmaker</i>, guru boleh membantu pelajar.</p>	Komputer riba (setiap pelajar) yang berisi Perisian <i>Newsmaker</i> .

Aktiviti Pembelajaran dan Soalan-soalan Guru		Reaksi pelajar yang dijangkakan	Sokongan guru (soalan susulan sebagai panduan terhadap pembelajaran pelajar)	Penilaian Bagaimanakah penilaian dilakukan? Apakah wahana ( <i>tools</i> ) yang digunakan?
Masa	Aktiviti			
10 minit	<p><b>Langkah 4</b></p> <p>Guru memberikan arahan bagi menjalankan penilaian rakan. Pelajar dikehendaki supaya bergerak mengikut putaran jam dan duduk di tempat rakan.</p> <p>Pelajar dikehendaki memainkan rakaman rakan dan menilai penyampaiannya dari sudut isi dan gaya penyampaian dengan berpandukan rubrik yang disediakan.</p> <p>Setiap pelajar akan diberikan borang penilaian. Mereka dikehendaki memberikan penilaian kualitatif dan kuantitatif.</p> <p>Borang yang telah diisi perlu dipulangkan kepada pemilik rakaman untuk disemak semula.</p>	<p>Pelajar akan menonton rakaman rakan dan membuat penilaian dalam borang yang disediakan guru.</p> <p>Pelajar mungkin akan ragu-ragu untuk memberi penilaian yang sebenar kerana risau jika mereka :</p> <ol style="list-style-type: none"> <li>1. memberikan komen jujur yang memberat ke arah negatif, rakan akan mengambil hati.</li> <li>2. Memberikan komen jujur yang memberat ke arah positif, guru akan mengandaikan mereka tidak menilai dengan teliti.</li> </ol>	<p>Guru perlu meyakinkan pelajar bahawa apa sahaja markah yang mereka berikan kepada rakan perlulah yang bertepatan dengan kualiti penyampaian yang ditonton. Pelajar perlu menyokong markah yang mereka berikan dengan sebab-musabab yang bersifat kualitatif bagi rujukan dan justifikasi.</p> <p>Guru mengingatkan pelajar bahawa mereka perlu bersifat terbuka menerima teguran rakan agar pembelajaran ini dapat dijadikan proses belajar bersama yang berkesan.</p>	<p>Komputer riba</p> <p>Borang penilaian rakan</p> <p>Rubrik penilaian</p>
10 minit	<p><b>Penutup</b></p>			

Aktiviti Pembelajaran dan Soalan-soalan Guru		Reaksi pelajar yang dijangkakan	Sokongan guru (soalan susulan sebagai panduan terhadap pembelajaran pelajar)	Penilaian Bagaimanakah penilaian dilakukan? Apakah wahana ( <i>tools</i> ) yang digunakan?
Masa	Aktiviti			
	<p>Guru memandu para pelajar untuk berkongsi pandangan dan penilaian mereka terhadap prestasi yang ditunjukkan melalui latihan ini.</p> <p>Guru menggalakkan pelajar saling memikirkan solusi bagi masalah yang dihadapi sepanjang menjalankan latihan rakaman awal tadi.</p> <p>Guru mengajak pelajar merumuskan pelajaran dengan menyemak semula objektif asal yang ingin dicapai.</p> <p><b>Apakah yang telah dipelajari sepanjang pelajaran ini?</b></p>	<p>Pelajar akan membuat refleksi.</p> <p>Sumbangan pelajar mencerminkan tahap pemahaman dan penerimaan mereka terhadap keseluruhan pelajaran ini.</p>	<p>Guru mencatatkan objektif yang telah tercapai pada papan tulis.</p> <p>Guru memberikan komen berdasarkan pemerhatian yang dijalankan guru.</p>	<p>Pena <i>marker</i></p>



**Proses Pembelajaran**

**Rancangan Pengajaran Kajian Kitaran 2**

**Matlamat Pengajaran**

Pelajar dapat:

1. menggunakan 8-10 ayat yang lengkap dan gramatis untuk menyusun isi.
2. menggunakan sebutan baku sewaktu merakam penyampaian lisan.
3. menjalankan penilaian sendiri dan penilaian rakan berpandukan rubrik yang telah disediakan

Aktiviti Pembelajaran dan Soalan-soalan Guru		Reaksi pelajar yang dijangkakan	Sokongan guru(soalan susulan sebagai panduan terhadap pembelajaran pelajar)	Penilaian Bagaimanakah penilaian dilakukan?Apakah wahana ( <i>tools</i> ) yang digunakan?
Masa	Aktiviti			
5 minit	<p><b>Induksi</b></p> <p>Guru mencungkil pengetahuan sedia ada pelajar. Pelajar dikehendaki menghuraikan mnemonik L.A.P. berdasarkan slaid PPT yang ditayangkan oleh guru.</p> <p>Strategi: <i>Rally Robin</i></p> <p>Berdasarkan jawapan pelajar, guru akan merangkumkan objektif bagi pembelajaran ini dengan menayangkan slaid ‘Objektif</p>	<p>Pelajar boleh menjawab soalan guru berpandukan pengetahuan sedia ada yang dimiliki.</p> <p>Ini kerana penggunaan pendekatan L.A.P. telah dijadikan satu rutin dalam latihan-latihan lisan sebelum ini.</p>	<p><i>Apakah yang dimaksudkan dengan huruf ‘L’, ‘A’ dan ‘P’ dalam mnemonik ini?</i></p> <p><b>L – Apakah yang kamu LIHAT?</b></p> <p><b>A – Apakah andaian kamu berkenaan apa yang kamu lihat?</b></p> <p><b>P – Apakah pandangan peribadi kamu berkenaan hal</b></p>	<p>Slaid pembentangan <i>Powerpoint</i></p> <p>Penilaian Informal (Berdasarkan jawapan sumbangan pelajar.)</p>

Aktiviti Pembelajaran dan Soalan-soalan Guru		Reaksi pelajar yang dijangkakan	Sokongan guru(soalan susulan sebagai panduan terhadap pembelajaran pelajar)	Penilaian Bagaimanakah penilaian dilakukan? Apakah wahana ( <i>tools</i> ) yang digunakan?
Masa	Aktiviti			
	Pembelajaran' kepada para pelajar.	Pelajar cuba memikirkan antara objektif yang ingin dicapai untuk pelajaran ini.	<b>yang berlaku ini?</b> <i>Apakah tujuan kita menggunakan mnemonik ini?</i>	
10 minit	<p><b>Langkah 1</b></p> <p>Guru menayangkan gambar yang pertama. Senarai kata yang mengandungi perkataan-perkataan yang dapat membantu juga turut ditayangkan. Pelajar dikehendaki menggunakan perkataan-perkataan dalam senarai yang diberikan untuk membentuk ayat-ayat yang menonjolkan isi-isi yang mengarah kepada pendekatan L.A.P.</p> <p><b>Lihat gambar-gambar berikut dan fikirkan fokus utama yang boleh diperbualkan.</b></p> <p>Guru menayangkan pula gambar kedua lengkap dengan senarai perkataan yang dapat membantu lalu guru perlu mendapatkan respons yang serupa daripada</p>	<p>Setiap pelajar dapat menyumbang satu isi.</p> <p>Sekurang-kurangnya tiga isi penting dapat dikongsi secara lisan bagi setiap satu gambar</p> <p>Apabila pelajar mengalami masalah mencari isi utama, guru boleh mengajukan soalan-soalan rangsangan bagi membantu pelajar membentuk isi-isi utama tersebut.</p>	<p><u>Soalan rangsangan bagi Gambar 1</u></p> <p><i>Apakah aktiviti-aktiviti utama yang kamu lihat berlaku dalam gambar ini?</i></p> <p><i>Apakah yang dilakukan pelajar lelaki di bahagian kanan/ tengah gambar ini? Mengapakah dia melakukan hal demikian?</i></p> <p><i>Apakah yang berlaku kepada pelajar di bahagian kiri gambar ini? Mengapakah hal ini berlaku kepadanya?</i></p> <p><u>Soalan rangsangan bagi Gambar 2</u></p> <p><i>Siapakah orang-orang di dalam</i></p>	<p>3 gambar yang berbeza</p> <p>Slaid Persembahan</p>

Aktiviti Pembelajaran dan Soalan-soalan Guru		Reaksi pelajar yang dijangkakan	Sokongan guru(soalan susulan sebagai panduan terhadap pembelajaran pelajar)	Penilaian Bagaimanakah penilaian dilakukan?Apakah wahana ( <i>tools</i> ) yang digunakan?
Masa	Aktiviti			
	<p>pelajar.</p> <p>Guru menayangkan gambar terakhir lengkap dengan senarai perkataan yang dapat membantu lalu guru perlu mendapatkan respons yang serupa daripada pelajar.</p>		<p><i>gambar ini. Apakah yang mereka lakukan?</i></p> <p><i>Mengapakah mereka berada di tempat ini?</i></p> <p><i>Mengapakah mereka melakukan aktiviti ini?</i></p> <p><u>Soalan rangsangan bagi Gambar 3</u></p> <p><i>Apakah yang dilakukan oleh tiga pelajar ini?</i></p> <p><i>Apakah kesan daripada perbuatan mereka ini?</i></p> <p><i>*Senarai perkataan yang dapat membantu kupasan isi</i></p>	
10 minit	<p><b>Langkah 2</b></p> <p>Secara berpasangan, pelajar akan ditugaskan meneliti satu daripada tiga gambar yang ditayangkan awal tadi.</p> <p>Secara individu, pelajar dikehendaki</p>	<p>Pelajar akan menggunakan isi yang telah dibincangkan secara sepintas lalu untuk dikembang dan digabungkan</p>	<p>Guru boleh memberi panduan kepada pelajar dengan menekankan keperipentingan proses berfikir menggunakan pendekatan berstruktur L.A.P.</p>	<p>Penyusun Grafik L.A.P.</p> <p>3 gambar dalam bentuk salinan keras – 1 gambar bagi setiap gambar</p>

Aktiviti Pembelajaran dan Soalan-soalan Guru		Reaksi pelajar yang dijangkakan	Sokongan guru(soalan susulan sebagai panduan terhadap pembelajaran pelajar)	Penilaian Bagaimanakah penilaian dilakukan? Apakah wahana ( <i>tools</i> ) yang digunakan?
Masa	Aktiviti			
	<p>menghasilkan antara 8 hingga 10 ayat yang gramatis yang mencerminkan aktiviti yang berlaku dalam gambar serta andaian dan pandangan peribadi.</p> <p><b>Isi lembaran yang diberikan dengan huraian yang sesuai.</b></p>	<p>menggunakan ayat yang gramatis.</p> <p>Pelajar yang cemerlang dibolehkan menulis isi dalam bentuk butiran sahaja. Manakala, pelajar yang sederhana dikehendaki menulis ayat yang penuh. Sekitar 5 baris ayat diperlukan bagi penyampaian yang baik.</p>	<p><i>Apakah perkara utama yang kamu lihat?</i></p> <p><i>Mengapakah hal ini berlaku?</i></p> <p><i>Apakah yang mungkin menyebabkan hal ini berlaku?</i></p> <p><i>Adakah perkara yang berlaku ini sesuatu yang baik atau sebaliknya? Adakah ia perlu digalakkan atau dielakkan?</i></p> <p><i>*Senarai perkataan yang dapat membantu kupasan isi.</i></p>	<p>Senarai kata bagi membantu pelajar</p>
15 minit	<p><b>Langkah 3</b></p> <p>Secara bergilir, pelajar dikehendaki merakam isi yang telah dicatatkan dalam lembaran menggunakan perisian <i>Newsmaker</i>.</p> <ul style="list-style-type: none"> <li>• Pelajar boleh menggunakan ikon animasi yang tersedia di dalam perisian tersebut untuk menambah nilai rakaman penyampaian</li> </ul>	<p>Pelajar akan merakamkan isi-isi yang telah dicatat pada penyusun grafik masing-masing menggunakan sebutan baku.</p> <p>Antara masalah yang mungkin timbul ialah pelajar akan</p>	<p>Guru perlu memastikan jarak antara tempat duduk pelajar cukup selesa agar pelajar tidak terjejas sewaktu ingin membuat rakaman.</p> <p>Peranan guru hanya memantau. Namun, seandainya pelajar bermasalah mengendalikan perisian <i>Newsmaker</i>, guru boleh</p>	<p>Komputer riba (setiap pelajar) yang berisi Perisian <i>Newsmaker</i>.</p>

Aktiviti Pembelajaran dan Soalan-soalan Guru		Reaksi pelajar yang dijangkakan	Sokongan guru(soalan susulan sebagai panduan terhadap pembelajaran pelajar)	Penilaian Bagaimanakah penilaian dilakukan? Apakah wahana ( <i>tools</i> ) yang digunakan?
Masa	Aktiviti			
	<p>mereka.</p> <p>Seandainya pelajar mempunyai lebih masa, pelajar perlu mengulang tayang rakaman sendiri dan menilai penyampaian sendiri dengan berpandukan rubrik yang disediakan oleh guru.</p> <p>Kemudian, pelajar boleh merakam semula penyampaian mereka jika masa mengizinkan.</p>	<p>‘melambatkan’ proses memulakan rakaman kerana malu atau risau mereka akan menarik perhatian rakan-rakan yang lain di sekeliling.</p>	<p>membantu pelajar.</p>	
10 minit	<p><b>Langkah 4</b></p> <p>Guru memberikan arahan bagi menjalankan penilaian rakan. Pelajar dikehendaki supaya menilai rakaman yang telah dibuat oleh pasangan masing-masing.</p> <p>Pelajar dikehendaki memainkan rakaman rakan dan menilai penyampaiannya dari sudut isi dan gaya penyampaian dengan berpandukan rubrik yang disediakan.</p>	<p>Pelajar akan menonton rakaman rakan dan membuat penilaian dalam borang yang disediakan guru.</p> <p>Pelajar mungkin akan ragu-ragu untuk memberi penilaian yang sebenar kerana risau jika mereka :</p> <p>1) memberikan komen jujur</p>	<p>Guru perlu meyakinkan pelajar bahawa apa sahaja markah yang mereka berikan kepada rakan perlulah yang bertepatan dengan kualiti penyampaian yang ditonton. Pelajar perlu menyokong markah yang mereka berikan dengan sebab-musabab yang bersifat kualitatif bagi rujukan dan justifikasi. Guru perlu mengingatkan pelajar</p>	<p>Komputer riba</p> <p>Borang penilaian rakan</p> <p>Rubrik Penilaian</p>

Aktiviti Pembelajaran dan Soalan-soalan Guru		Reaksi pelajar yang dijangkakan	Sokongan guru(soalan susulan sebagai panduan terhadap pembelajaran pelajar)	Penilaian Bagaimanakah penilaian dilakukan? Apakah wahana ( <i>tools</i> ) yang digunakan?
Masa	Aktiviti			
	<p>Setiap pelajar akan diberikan borang penilaian. Mereka dikehendaki memberikan penilaian kualitatif dan kuantitatif.</p> <p>Borang yang telah diisi perlu dipulangkan kepada pemilik rakaman untuk disemak semula.</p>	<p>yang memberat ke arah negatif, rakan akan mengambil hati.</p> <p>2) Memberikan komen jujur yang memberat ke arah positif, guru akan mengandaikan mereka tidak menilai dengan teliti.</p>	<p>bahawa mereka perlu bersifat terbuka menerima teguran rakan agar pembelajaran ini dapat dijadikan proses belajar bersama yang berkesan.</p>	
10 minit	<p><b>Penutup</b></p> <p>Guru memandu para pelajar untuk berkongsi pandangan dan penilaian mereka terhadap prestasi yang ditunjukkan melalui latihan ini.</p> <p>Guru menggalakkan pelajar saling memikirkan solusi bagi masalah yang dihadapi sepanjang menjalankan latihan rakaman awal tadi.</p> <p>Guru mengajak pelajar merumuskan pelajaran dengan menyemak semula</p>	<p>Pelajar akan membuat refleksi.</p> <p>Sumbangan pelajar mencerminkan tahap pemahaman dan penerimaan mereka terhadap keseluruhan pelajaran ini.</p>	<p>Guru mencatatkan objektif yang telah tercapai pada papan tulis.</p> <p>Guru memberikan komen berdasarkan pemerhatian yang dijalankan guru.</p>	Pena <i>marker</i>

Aktiviti Pembelajaran dan Soalan-soalan Guru		Reaksi pelajar yang dijangkakan	Sokongan guru(soalan susulan sebagai panduan terhadap pembelajaran pelajar)	Penilaian Bagaimanakah penilaian dilakukan? Apakah wahana ( <i>tools</i> ) yang digunakan?
Masa	Aktiviti			
	objektif asal yang ingin dicapai.  Apakah yang telah dipelajari sepanjang pelajaran ini?			

## Critical Thinking in Argumentative Essay Writing

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**Abstract:** The team bears the intention to develop our students into critical thinkers with good communication skills. The target of our Research Lesson was Secondary Three Express pupils. Sifting out the inability to contend views as an issue pervading our students, the team chose to move temporarily away from the common questions used in argumentative texts and recast the typical debate that has been done at the level into a law case, positioning our students as the Prosecution, Defending Lawyers and the Jury. Topics like “Is abortion murder”, when researched on the internet, would yield much information that the student might not be able to qualify as necessary or not to substantiate their stand. The team aims to train discernment and the competent employment of material in the students. Where students previously have difficulty coming up with points to support a view that they might have adopted less-than-clearly, their case is now fixed for them, and they will, through the lessons, develop the judgement required for them to effectively argue. In order to interest our students in the ‘legal process’ we have enlisted Hansel and Gretel, and made crucial twists with a suggested charge against the children instead, re-presenting them as the antagonists. The students were also provided background information of the characters, allowing endearment to grow for the unlikely ones. With this, the students are weaned from the conventional fairy tale, where the witch is immediately determined ‘wicked’, and challenged to consider the story from a different point of view.

**Keywords:** Argumentative, point

### 1 INTRODUCTION

*Profile and Background Information of our school, students and teachers*

Clementi Town Secondary School is a government school that houses three education streams - Express, Normal Academic and Normal Technical. The school typically admits students with a PSLE aggregate range of 231 to 246 for Express students, 181 to 199 for Normal Academic students and 141 to 156 for Normal Technical students. There are usually 4 Express Classes, 2 Normal Academic and 1 Normal Technical class per level. Our students hail from varied family backgrounds, and are generally competent in conversational English. The English Language Department has a total of 18 teachers, with English Language as their Curriculum Subject (CS) 1 or 2.

Although the students are fairly able to converse in the language, they lack the content in the presentation of a viewpoint and the ability to construct strong arguments. The team had also noticed the current trend of teenagers lapsing into the response of “just because” to questions posed at them, which hinders their development of thinking and subsequently the delivery of a perspective. “Just because”, commonly heard among teenagers, is a phrase employed under the circumstances of two main scenarios:

- a) There truly is no good answer.
- b) The speaker sees no need to explain himself/herself.

However, the students might abuse the term, where they hide behind the phrase and conveniently dismiss the need to articulate their thoughts effectively. This is converse to the application of the



conjunction “because”, which warrants the need for an explanation or reason.

*Broad goal for students and the research team’s aim*

While the students are generally able to cope with the English Language examinations, the arguments they present, as felt by the team, possess much potential to be developed. Hence, our research team had decided to focus on guiding our students to critically appraise information given to them, and we hope that through this research lesson, our students will be capable to construct an effective presentation of their stands. With the steps to treat information critically mapped out for the students, we hope to sift out even more, the issues they face when they are given a discussion question, should they still prove unable to deliver a sound argument.

*Broad goal for teachers and the research team’s aim*

English Language teachers in CTSS guide the students in argumentative writing with the P-E-E-L structure, which should be applied to each paragraph in the essay or speech. The P-E-E-L structure refers to *Point, Example, Explanation* and *Link* and the students craft the argument with a minimum of three paragraphs (not including Introduction and Conclusion). While the department provides the general lesson materials for all teachers across five levels and three streams, the conducting of the lesson inevitably, determines the learning outcomes of the students. The team hence aims to develop too, with this research lesson, the facilitation methods with specific focus on learning environment (on top of the instructional plan) for the proposed Case Preparation Lesson.

**2 OVERVIEW AND LESSON AIMS**

The topic for our English lesson is argumentative writing/speech and the goals of our research lessons are for our students to identify the intent or purpose of the information given, distinguish between facts and inferences drawn from the information provided, make inferences that are consistent with one another and construct defensible, thoughtful and logical conclusions thereafter. In this lesson, students were to work in a group to collaborate on their learning and articulate their decisions effectively. They were also expected to be able to analyse the additional information and discern whether it is useful (defensible, thoughtful and logical) to the

assignment before selecting them and drawing up convincing reasons to justify their selections.

The team had chosen a simple fairy tale, Hansel and Gretel, and suggested that the protagonists, who have been positioned for the readers to be the pitiable children who were bullied and mistreated by the evil witch in the gingerbread house, could be of malicious intent instead. This was done with the aim to wean our students from the comforts of passive reception of information and consider actively, the text from a different perspective – that the witch was in fact, the victim after all. Often, readers automatically adopt the view that the witch in a fairytale would be the antagonist and ‘evil’. However, the team sought to throw the students off-guard and get them to critically consider the possibility of the children deserving what had been done to them, and the witch actually being the one who was misunderstood and had her safety threatened instead.

The team member conducting the lesson first began by introducing legalese to the students. They were then put through a flipped lesson, where they had to read up on the material provided to equip them with the right terms to employ during their ‘court case’, and then take a quiz online to concretise their understanding. The class was then divided into two groups, the Prosecution and the Defence, and then briefed on their roles in class. They were also guided to understand the concept of aggravating and mitigating factors. Subsequently, the students were taught the difference between evidence and information.

*Employing the right environment (setting) to achieve teacher aims*

The team member conducting the lesson also enlisted two different settings for the conducting of the lesson. The first class, 3C1, was made to sit on the left and right of the classroom, with only a spatial divide between the Prosecuting and Defending Teams. The second class, 3D1, had a distinct row of tables dividing the two teams.

## 2.1 Research Lesson Instructional Plan

Table 1. Research Lesson Version 1

Steps of the lesson: learning activities and key questions (and time allocation)	Student activities/expected student reactions or responses	Teacher’s response to student reactions/Things to remember	Goals and Method(s) of evaluation
<p><b>1) Introducing Legalese</b> Students would have read up about the terms online and attempted a quiz. Teacher then checks in on the understanding in class again.</p>	<p>Students may have preconceived notions about how courts function, particularly with regard to criminal charges and proceedings.</p>	<p>Teacher will need to clarify that this is not a civil suit (i.e. one party suing the other). In this case, the Prosecution wins by securing a conviction while the Defence wins by preventing the conviction.</p>	<p>Students should end up with a clear idea of what their task will demand of them. This can be evidenced in their written work at the end of this lesson and the next one.</p>
<p><b>2) Case Brief</b> - Teacher will divide students into Prosecution and Defence and brief them of their roles.  - The concepts of aggravating and mitigating factors will also be introduced. (10 minutes)</p>	<p>Students will need to understand the concept of ‘innocent until proven guilty’.  Students assigned to the Defence may feel that their task is impossible due to their knowledge of the original fairy tale.</p>	<p>Teacher to explain to students that the ‘burden of proof’ lies with the Prosecution who must prove their case ‘beyond reasonable doubt’. The role of the Defence is to show that the Prosecution’s case is not watertight.</p>	<p>Evaluation of whether students have understood what is expected of them will be evident in the arguments that they craft for their written submissions which are due in the next lesson.</p>
<p><b>3) Handling Evidence</b> - Teacher will explain the difference between information and evidence.  - Several examples will be included.</p>	<p>Students will be given a few sample scenarios and tasked with picking on the relevant information as evidence. Students to determine whether the information is useful or not.</p>	<p>In the course of completing the sample exercises, teacher should emphasize the importance of focusing the relevant information, not the most attention-grabbing.</p>	<p>Student ability to select the appropriate information in the samples, as well as their submitted work, will serve as indicators of students’ understanding.</p>
<p><b>4) Group Work</b> - Students will break into smaller groups to discuss their cases.  - Teacher will inform them that there are 5 bonus sources of information that students can earn. (20 minutes)</p>	<p>In their groups, students will need to determine 3 pieces of extra information they would like to call for  Students will need to briefly explain why such information might be useful to them.  Upon receiving their bonus information, students will need to analyse and discern the usefulness of each piece of bonus information to their case.</p>	<p>Teacher will need to evaluate the various requests for information from students, checking for the quality of explanations before releasing the bonus information to the students.</p>	<p>Students’ justification for receiving the bonus information, as well as their analysis of their bonus information can be graded according to the critical thinking rubric to determine the competency of students.</p>

Table 2. Research Lesson Version 2

Steps of the lesson: learning activities and key questions (and time allocation)	Student activities/expected student reactions or responses	Teacher’s response to student reactions/Things to remember	Goals and Method(s) of evaluation
<b>1) Handling Evidence</b> - Teacher will explain the difference between information and evidence. - Several examples will be included. (15 minutes)	Students will be given a sample scenario and a list of information points and potential leads.  Students to determine whether the information is useful or not to their case.	In the course of completing the sample exercises, teacher should emphasize the importance of focusing the relevant information, not the most attention-grabbing.  Teacher should explain explicitly why some of the information is irrelevant.	Student ability to select the appropriate information in the samples, as well as their submitted work, will serve as indicators of students’ understanding.
<b>2) Group Work</b> - Students will break into smaller groups to discuss their cases. (30 minutes)	Students are given all information and will need to analyse and discern the usefulness of each piece of bonus information to their case.	Teacher will collect the various requests for information (for later evaluation) from students.  Once this first task has been completed, the teacher will release the bonus information to the students for the second task.	Students’ justification for receiving the bonus information, as well as their analysis of their bonus information can be graded according to the critical thinking rubric to determine the competency of students.

## 2.2 Observation Guide

Table 3. Observation Guide

Steps of the lesson: learning activities and key questions (and time allocation)	Student activities/expected student reactions or responses	Checklist: Observables based on lesson goals
<b>1) Introducing Legalese</b> Students would have read up about the terms online and attempted a quiz. Teacher then checks in on their understanding in class again.	Students may have preconceived notions about how courts function, particularly with regard to criminal charges and proceedings.	<b>Problem:</b> Clearly define the issue and accurately identify core issue  <input type="checkbox"/> Students raise hands to clarify terms <input type="checkbox"/> Students ask questions pertaining to case
<b>2) Case Brief</b> - Teacher will divide students into Prosecution and Defence and brief them of their roles.  - The concepts of aggravating and mitigating factors will also be introduced.	Students will need to understand the concept of ‘innocent until proven guilty’.  Students assigned to the Defence may feel that their task is impossible due to their knowledge of the original fairy tale.	<b>Problem:</b> Clearly define the issue and accurately identify core issue  <input type="checkbox"/> Students raise hands to clarify concepts <input type="checkbox"/> Students ask additional questions pertaining to case

Steps of the lesson: learning activities and key questions (and time allocation)	Student activities/expected student reactions or responses	Checklist: Observables based on lesson goals
<p><b>3) Handling Evidence</b></p> <ul style="list-style-type: none"> <li>- Teacher will explain the difference between information and evidence.</li> <li>- Several examples will be included.</li> </ul>	<p>Students will be given a few sample scenarios and tasked with picking on the relevant information as evidence.</p>	<p><b>Information:</b> distinguish between information and inferences drawn from information provided</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Students select information by underlining/highlighting</li> <li><input type="checkbox"/> Students raise hands to clarify doubts</li> <li><input type="checkbox"/> Students able to articulate difference between information and evidence</li> </ul>
<p><b>4) Group Work</b></p> <ul style="list-style-type: none"> <li>- Students will break into smaller groups to discuss their cases.</li> <li>- Each group gets all the pieces of evidence and information (where previously they had to earn it)</li> </ul>	<p>Students will need to analyse and discern the usefulness of each piece of information to their case.</p>	<p><b>Information:</b> distinguish between information and inferences drawn from information provided</p> <p><b>Interpretation:</b> Follows where evidence and reason lead in order to obtain defensible, thoughtful, logical conclusions or solutions. Makes inferences that are consistent with one another</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Students participate in active discussion in their groups</li> <li><input type="checkbox"/> Students able to articulate reasons for choice of information</li> <li><input type="checkbox"/> Students able to write down reasons for choice of information</li> <li><input type="checkbox"/> Students apply close reading of bonus information</li> <li><input type="checkbox"/> Students discuss the merits and demerits of bonus information</li> <li><input type="checkbox"/> Students are able to decide on eventual choice of information</li> </ul>

Notes:

- **Problem:** Clearly define the issue and accurately identify core issue
- **Information:** distinguish between information and inferences drawn from information provided
- **Interpretation:** Follows where evidence and reason lead in order to obtain defensible, thoughtful, logical conclusions or solutions. Makes inferences that are consistent with one another

### 3 POST-LESSON ANALYSIS

For the post-lesson discussion, the team had noted that while the students were interested in the lesson, they were unable to devote enough time to analyse the evidences well. It was observed that the students created information that was not useful to their arguments or there was a lack of development in their arguments. This was a result of the lesson plan having too many activities. As a refinement, the team removed two activities and included them in the lesson prior to the Research Lesson instead. The focus of the lesson then would be the analysis of evidence. The team also made the lesson targets more concise and added another structure to help the students in processing the information when they analyse the evidence given. The students were also not able to present strong arguments as not all teams sought to obtain more evidence. This resulted in the arguments being uneven.

The team had also noticed that the court scene was still not well-presented as each team typically would have a domineering speaker. This was more so for 3C1, who had no specific setting other than a spatial divide between two teams.

Pertaining to the learning environment (setting) of the lessons, 3D1 had been more aware of the ‘argumentative’ nature of their speech with the tables providing the visual divide between both sides (traverse stage setting). 3C1, on the other hand, had difficulty moving beyond just presenting points, and were less able to pick out the flaws in the opposing team’s arguments, where they had the potential to. The students from 3D1 however, tended to turn to the teacher for support.

With regard to the observation checklist, the team had removed some observables and refined them as we noticed that the students did not exhibit the suggested behaviours in the Research Lesson. We had also altered the observables to link them to the lesson targets. We have also added a guided reading to the text Hansel and Gretel, instead of allowing free reading, which might result in the students adopting different versions of the text for the Research Lesson. Although there is a general storyline for Hansel and Gretel, there are different versions available online, including Brothers’ Grimm and Classic Fairy Tales.

The second iteration of the lesson is a clear improvement in the students’ reception and the observers are able to anticipate the students’ behaviours. This resulted in the lesson being more structured and guided. The arguments presented were much more coherent and the case proved to be better analysed than the first Research Lesson. The students were also given all the pieces of evidence instead of making them earn the information which had resulted in uneven starting points, to truly focus on the quality of their argument.

Thus, the team aimed to further refine the lesson plan for the next iteration, and we sought to refine the process by getting everyone in the team to focus on a piece of evidence and students would take turns to present. We also aimed to actively engage the jury with the observation checklist and the evidence provided.

The setting is also altered from 3D1’s traverse stage setting to a thrust stage setting instead, positioning the ‘Judge’ very clearly at the tip of the ‘T’. This revision allowed the students to better immerse in the ‘courtroom’ setting and be very clear of which side of the argument they belonged to. Both classes were also more able to pick out arguments of the opponents. The issue of having a dominant speaker was also resolved with this physical arrangement of the teams.

### 4 CONCLUSION

The team recognises that this Research Lesson addresses the issue of our students not being able to articulate their stands and substantiate their points and the root problem is the lack of discernment in treating information provided to them. The team notes the great interest that the students have displayed with this new approach to argumentative writing and speech, and aims to refine the court case that they would engage in, for future use in English Language lessons in 2015. With time, the team hopes that the development of critical thinking skills would begin from Secondary One, where in Lower Secondary we would aim to train ‘detectives’ in our students, where they would be critical of the information they receive, and in Upper Secondary we would nurture ‘lawyers’, where they would be able to effectively argue the stands that they have adopted, with the careful and clever enlistment of the information they have determined to be useful to them.

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## Using Hit Bottle Game To Improve English Vocabulary Mastery Of The Ninth Graders

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**Abstract:** This article describes the effectiveness of using *Hit Bottle Game* to Improve English Vocabulary Mastery of Ninth Graders. Vocabulary acquisition is the largest and the most important facing the language learners. (Swan and Walter as cited by Thornbury.2002) Monotonous teaching English vocabulary often makes students bored and demotivated as the result they are not able to achieve the objective of the lesson. So that teachers must be creative to use interesting technique in teaching English vocabulary. Beside that Cervantes (2009) states that English classes need to be more interactive to keep students interested in the lessons. One of techniques to make teaching English class live up is using games. Games are effective teaching tools and have many positive aspects, including the creation of opportunities for students to communicate in a relaxed, friendly, and cooperative environment (Cervantes 2009). It is believed that using games in teaching English class can create a more motivating instruction which make students more enthusiastic in learning English. In addition, the use games, including traditional games can build students up positive character such as responsibility, respect, competitive, and team-work. This article is aimed to explore the effectiveness of using *Hit Bottle* game inspired by well-known traditional games *Pukul Air* that students have been familiar with the game in order to make easy in practicing the game. In addition, this article also I will report on feedback from my students regarding how they feel about the use of games in the EFL classroom. Based on experiment in our class, the result showed that there was significant improvement in English vocabulary. The students' vocabularies are higher than before. This shows that the implementation of *Hit Bottle* game is effective in improving students' vocabulary. Furthermore, verbal student's feedback gives positive responds and agrees that the game fulfills the five criteria of game design proposed by Hill et all (2013), i.e. enjoyable, engaging, educational, English promoting, and easy to use.

**Keywords:** Hit Bottle, Game, Vocabulary

### 1 INTRODUCTION

This paper describes the effectiveness of using *Hit Bottle Game* to Improve English Vocabulary Mastery of Ninth Graders. In learning a new language, the first thing that learners must do is to master many words of target language (TL). Vocabulary mastery is an important element to understand the new language.

Vocabulary, much more than grammar, is the key to your child understanding what she hears and reads in school; and to communicating successfully with other people. For this reason it is very important for her to quickly build up a large store of words. Research studies have shown the strong links between having an extensive vocabulary and achieving school success. (<http://esl.fis.edu/parents/advice/vocab.htm>)

It is clearly stated that learners who have a lot of vocabularies are capable to use them will be more successful in developing their language skills than those who are poor in vocabulary. For further, Swan and Walter a (as cited by Thornbury, 2002) states that vocabulary acquisition is the largest and the most important facing the language learners. Learners need vocabulary which can support them to produce and use meaningful sentences because vocabularies provide organ of sentence.

However teaching vocabulary at junior high school is not simple tasks. Selecting techniques is very important in presenting class to attract student's attention. Teachers should consider the student's characteristics and material which are going to be taught. Monotonous teaching English vocabulary often makes students bored and demotivated as the result they are not able to achieve the objective of

the lesson. So that teachers must be creative to use interesting technique in teaching English vocabulary.

## 2 DISCUSSION

Interactive activities are needed for English classes to keep students interested in the lessons. What should teachers do if their students get bored and demotivated? One of techniques to make teaching English class live up is using a variety of games that directly involve language production. Games are effective teaching tools and have many positive aspects, including the creation of opportunities for students to communicate in a relaxed, friendly, and cooperative environment (Cervantes, 2009). It is believed that using games in teaching English class can create a more motivating instruction which make students more enthusiastic in learning English.

The advantages using games can be summarized as follows:

1. Games add variety to the range of learning situations
2. Games can be used to change the pace of a lesson and so maintain motivation
3. Games can be used to punctuate long formal teaching units and renew students' energy before returning to more formal learning.
4. Games can give hidden practice of specific language points without students being aware of this
5. Games encourage student participation and can remove the inhibitions of those who feel intimidated by formal classroom situations.
6. Games can change the role of the teacher from that formal instructor to that organizer of activities that students enjoy participating in.
7. Games can increase student communication, and so reduce the domination of the classroom by the teacher.

Games and activities are invaluable to the teacher of a foreign language because they provide an opportunity for students to use their language skills in a less formal situation (Carrier, 1985). In addition, the use games, including traditional games can build students up positive character such as responsibility, respect, competitive, and team-work.

This article is aimed to explore the effectiveness of using *Hit Bottle* game inspired by well-known traditional games *Pukul Air* that students have been familiar with the game in order to make easy in practicing the game.

### Hit The Bottle

Source : Adapted from an Indonesian Traditional Game Called "Pukul Air"

Age : Junior High School

Level Of English Difficulty : Moderately Hard

Number of Players: 5-10

Time for Player : About 20 Minutes

### Lesson Objective

Provided two sets of clue card, players should find a good answer stuck to a plastic bottle/glass by hitting it.

### Material

1. List of words for marking
2. Two sets of clue cards
3. Words stuck on a plastic bottle/glass
4. Stick made of rolled cartoon
5. Rope

### Preparation

1. Divide the players in class into two groups of five-ten
2. Hang 15 words or more stuck on the plastic bottle/glass at a long horizontal rope
3. Put two sets of clue cards on the table between both groups
4. Give a stick to each group
5. Player 1 of each group will be the first executor while the second ones will take one of clue cards
6. The teacher will be a judge

### Rules

Object of the game: to guess and pronounce a word.

1. The second player of each group starts by taking one clue card on the table after instruction using a flute, then discuss it with their group.
2. The first player of each group should run to find the right answer stuck on the plastic bottle/glass by hitting it. He/she is allowed to hit it only once. He/she who is able to hit the



right answer fastest, pronounce and spell it well will get 1 point for his/her group.

3. The first players of each group come back to their groups, give the stick to the second players and stay at the back of the group and the third players do as the second player did in step 1 while the second players do as the first player did and furthermore, do it in turn.
4. The game continuous until the whole jumble words cards on the tables has been finished
5. The winner is the group that gets point more than the other.

A lot of games have a competitive or point-scoring element in them. By making point-scoring, it can determine the winner so that the winner may receive a gift. It can make students actively involved in the activities and more motivated because sometimes students join the games not only for fun but also for prize. The prize or reward, rolled as feedback and reinforcement, will motivate them to continue learning. For example, when one of us presented a game, she gave us a gift. And I felt so happy and encourage learning more.

Using games in way to teach English more interactive is not without problems. Games that make students enthusiastic always make classes noisy. It can disturb other class activity. For example, when I held my games in class, in the middle activities somebody interrupt and asked to be quite. So it needs to be anticipated before starting the game. Another problem is timing. The games very often use much time that spend whole activities of class. This is not good because games is used as compliment of teaching not as main activity. So teacher must be carefully to choose a game in order to use time effectively. Teachers can use games 20-30 minutes. Other problem is deciding game that would be most appropriate and most successful with students at any one time.

### 3 CONCLUSION

In conclusion, using games as complement activities is invaluable to the teacher. Simulation shows that the implementation of Hit Bottle game is effective in teaching students' vocabulary. Verbal student's feedback gives positive responds and agrees that the game fulfills the five criteria of game, that is, i.e. enjoyable, engaging, educational, English promoting, and easy to use.

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## Teacher's Learning on Seating Arrangement: A Case Study of Assessment in Learning

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**Abstract:** Assessment of learning is often a difficult thing for teachers, one hand a teacher must pay attention to each student's competences will be assessed, while on the other hand it should be kept to facilitate the learning process. Some teachers who are not satisfied that the assessment in learning can be done after it by using teacher's memory on students activities, start to find their own strategy that allows to recognize students from their seating arrangement. This paper examines a junior high school science teacher who modifies seating arrangement during 5 months learning to obtain the most optimal seating arrangement that allows her to conduct an assessment in learning. The teacher has been experienced with lesson study since last 4 years ago. The strategy might be internalized from a case study of student activities in the classroom, but teacher sense and competencies could be developed through learning activities of interaction with colleagues in the teacher professional development activities such as lesson study. Field notes for 5 months during her teaching period in a half academic year on 36 students are investigated and analyzed. How teachers' learn in finding most reasonable seating arrangements for recognizing students learn also discussed here.

**Keywords:** Assesment in Learning, seating arrangement, Lesson Study.

### 1 INTRODUCTION

West Java government did dissemination of Lesson Study for 10 regencies in three years starting in 2011 until 2013. This forum found some teacher's problem in learning process, especially in assessment. According to government law no 19, 2005, one of teacher's duty is assessing of learning. Several reasons found related to how hard teachers to doing some assessment process, i.e. the assessment format is too rigid, difficult to be filled, teachers do not have enough time to assessing, and how hard teachers to be facilitator in learning and to pay attention in student's competence assessment at the same time. That is why teachers did assessment after learning process be done rely on their memory. Meanwhile, in science learning, teachers have to doing assessment in learning process. It is useful to help students get the learning purpose. That is why assessment has to be done together or along with, in learning process either after learning be done.

Regarding to this learning way, it is analogous with Curriculum 2013 in Indonesia which is

emphasizing process, so that teachers must doing assessment in learning process. There are three assessment aspect that must be fulfill in learning: knowledge, attitude and skill. Assessment process can be done in learning process including attitude and skill aspect. In learning process, teachers can assessing student's attitude to get student's attitude profile along with conducting them to change the negative attitude (for example: apathetic, passive, rely on the other team members, etc.) to the positive one. In additional, when learning process is going on, teachers can assessing skill aspect too, such as intellectual skill or psychomotor skill.

Teachers do realize there are some difficulties to do assessment process. Therefore, teacher must learning to find a new strategy which is can helping teacher's duty to be easier to do assessment process. This teacher's ability of course cannot be occur by itself, but through long and continuous process in certain vessel, such as Lesson Study. As an impact of dissemination of Lesson Study, teachers is accustomed to always made some daily notes in learning journal form. Based on this learning journal, teacher can find a new simple strategy to

make process assessment easier to do by utilizing student’s seating arrangement

**2 ASSESSMENT PROCESS FORMAT WITH SPECIAL TABLE**

When learning is taking place in the class, generally teacher stand up in the center of the class. He/she try to be able to see, observe, and communicate with the students during learning. From the teacher’s point of view, teacher can understand which student who achieved the competence and who is not yet. Usually teacher will approaching the problematic students and help them. But this condition is really rare to described in teacher’s finding note and be written in process assessment note. The main cause of this condition is the teachers are not adapting yet to write whatsoever during learning process.

This matter has been a case study in State Secondary School of 52, Bandung. The science teacher who had been teaching for the last seven years, and active in Lesson Study community tried to apply the Lesson Study’s habit in their class. She started to sketch the seating arrangement to identified student’s learning characteristic on the science learning journal. The alteration in this note is keep going on but it always describe the student’s seating position in the class.

When the learning is taking place, surely some point of assessment must be filled up based on anything teacher’s found out in the class. Generally, teacher decide which aspect will be assessed along with it rubric, then teacher will preparing an assessment table which is appropriate with its rubric. Just like explained in Table 1.



Table 1. Process Assessment Format in Force Measurement

Assessment Rubric:

Assessed Aspect	3	2	1
Scale reading	Student’s eyes is exactly in front of the scale	Student’s eyes is not properly enough in front of the scale	Student’s eye is forming a big angle with the scale (Parallax)
Stating the result of measuring	The scale measuring is sketched and marked. The result is exactly valid	The scale measuring is sketched and marked, but the result is not enough valid	Students drew dynamometer scale carelessly, the scale measuring is unmarked, the result of reading measurement is wrong

Table 2. Assessment Documentation Type

Name	Scale Reading			Stating the measuring result			Score	Mark
	3	2	1	3	2	1		
ALDI SURYA K.								
ANDI RAMDANI								
ANITA SETIAWATI								
ANWAR SAEPUDIN								
ARFAN HAMID								
And so on..								

Assessment format above at a glance looks like easy to do and ideal. But actually, this format is difficult to apply. Just imagine if there are 30 more students in one class which is the student’s name had already filled on the list. It makes consequence when the teacher doing some observation and assessing, the teacher need to find student’s name on the list while observing him/her, so that the teacher needs more time to fulfilled the format. This matter makes a problem if the assessing process going on learning process on one table which is prepared to be fulfilled to getting student’s profile. Meanwhile in one meeting, the teacher have to assured the

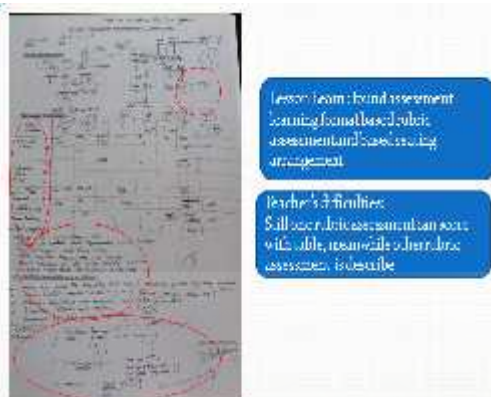
achievement of learning purpose, facilitated the students, and assessed.

The goal research is to describe how teacher find out most appropriate assesment input strategy that allows to recognize students from their seating arrangement as part of her “pushed-out” innovation .

Based on the problem above, teachers need a new strategy to do process assesment, such as attitude assesment, skill process, as well as product assesment in special form. The purpose of this format creating is to help teacher do easier way to filling the assesment data practically just in one paper format for one meeting, and it can be fulfilled in a shorter time along with learning process. Hopefully with this format creation, the teacher can get student’s profile learning, and can be used for whoever need this format without try to finding student’s name in the table of assesment beforehand which is waste more time.



Practically format which is mentioned before means to doing assesment process in the class with sketch of student’s seating arrangement and its “Special Table”. Student’s seating arrangement need to be made because it help the teachers easier to



observing. This sketch is appropriate with the class condition in that meeting. If the seating arranged classically, the sketch drew classically too, then teacher mark the line seating, so that the filling of special table can be observed: which student act active or passive based on the seating line. If the seating arranged as group activity, so the sketch drew appropriate as that condition as well, then mark the group name as necessity. This group seating arrangement sketch help the teacher to observe easily, not only observing the student’s group activities, but also student’s individual activity. Moreover, the special table as mentioned before is containing with some information of assesment aspect and its criteria, along with the student’s name. The teacher named it ‘special table’ because this table can be used teacher’s necessary of assesment for anything: skill process, attitude assesment, or product assesment. The form of assesment process can be seen in appendix part.

How to filled that format?

1. Firstly, make sure the student’s seating position in classically or grouping condition, then draw the sketch, mark the group’s name or line.
2. Make the special appropriate based on teacher’s necessity aspect. It made by teacher’s rubric which is had to be applied.
3. To filling the special table, concern about teacher’s observation aspect. Write down the student’s name, but only the students in 3 category or 1 category. If in one group indicating the same ability for all members, give the checklist mark due to its assesment category. This way make the assesment be more practicable and not wasting much time for assesment in learning.
4. If the raw data in special table had fulfilled, it means assesment process is finished
5. For getting student’s individual assesment, move the data to the process assesment format

The trial of assesment format with the special table above had been done in five months for 6 classes which is consist of 36 students. The result pointed out that, the format is really helping teacher to do assesment process. As a product, this special table also has excellence and weakness reviews. The excellence one is reviewing bellow:

1. Simple, quick, practical, and easy to be fulfilled in the class during learning process
2. Synergy with teacher’s performance
3. Can describe the class’s profile generally
4. Flexible for anything assesment, such as attitude or skill aspect during observation on going

As for the weakness of this format is not describing student's individual score assessment, so that the teacher has to move the data to the basic assessment format.

### 3 CONCLUSIONS

Teachers have to keep learning from the problems which is appeared in learning process. Assessing skill also must be owned by the teachers to do their duty in the class. The assessment process format with the 'special table' can be used by the teachers to help them assessing during learning process.

Assessment process format with special table is a product created from teacher's learning process to do the assessing process easier by using student's seating arrangement. This alteration is important to do as impact of Lesson Study activities for all teachers, especially from dissemination of Lesson Study in West Java, Indonesia.

### ACKNOWLEDGEMENTS

In this very happy occasion, I would like to thanks to principal of Junior High School 52 which give me to opportunity to do research with regard to how to

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This appreciation also goes to some of lecturer's at Faculty of Mathematics and Science Education especially for team of Lesson Study.

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**APPENDIX 1**

**Assessment Documentation Type**

Class : 8.4  
Day/date :

No.	Name	Scale Reading			Stating the measuring result			Score	Mark
		3	2	1	3	2	1		
1	ALDI SURYA K.								
2	ANDI RAMDANI								
3	ANITA SETIAWATI								
4	ANWAR SAEPUJIN								
5	ARFAN HAMID								
	And so on..								

**School Principal of 52 Junior High School Bandung,**

**Bambang Sudrajat, M.MPd.  
NIP. 196110051983021004**

**Bandung, January 2014  
Teacher,**

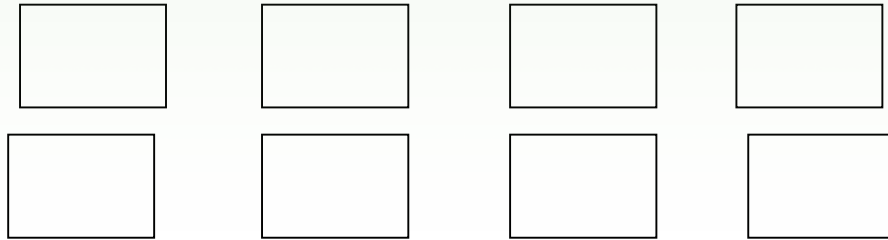
**Titin Supriyatin, S.Pd.  
NIP. 198306272009022002**

**APPENDIX 2**

Day / date :  
Class :

Absence student list :

**Seating arrangement sketch: (this is the example for group activity)**



**Finding in learning process:**

Assessing aspect		1 <sup>st</sup> Group	2 <sup>nd</sup> Group	3 <sup>rd</sup> Group	4 <sup>th</sup> Group	5 <sup>th</sup> Group	6 <sup>th</sup> Group	7 <sup>th</sup> Group	8 <sup>th</sup> Group
	3								
	2								
	1								
	3								
	2								
	1								

## School Based Lesson Study:

### *An Investigation of Practice, Achievement and Challenges in an Indonesian Junior Secondary School Science Teachers*

by

Doddy Rusmono

*Responses given by students as learners or English Language Learners (ELLs) function as the main theme in learning according to Structuralism. The students here fall into the category of SNED (Students of Non English Department). The responses include activities of reacting to statements, asking questions, questioning, and giving insights. Using English as a medium of responding, ELLs are constrained with linguistic and cultural aspects. The role of instructor as a facilitator is to generate some confidence on the ELLs' part by means of concealing inappropriatenesses while at the same time offering betterments. Source of being inappropriate are varied and complex comprising the mastery of vocabulary, knowledge of grammar, diction, and cultural differences. By merely integrating vocabulary and grammar to communicate, the meaning of expressions might not reach the intended receiver in the target language and, accordingly could end up with being incomprehensible on the receiver's part. Therefore, inappropriatenesses taking place "naturally" have to be appreciated in some way through Interest-Based Approach (IBA) with the wisdom and sympathetic care of Teacher Demeanor (TD). It is indicated that the feeling of being secure in every single session during the activities results in positive outcome on the ELLs' part through active involvement with FIESTA (Fun and friendly, Interactive, Explorative, Systematic, Technology savvy, Autonomous) mode of approach.*

*Key words: responses, inappropriatenesses, betterments, approach, secure*



## Introduction

The teaching of English as a foreign language to SNED (Students of Non English Departments) students as learners or ELLs (English Language Learners) needs certain approach. One of the SNED students groups at a school of *FIP (Fakultas Ilmu Pendidikan - Faculty of Education)* of *UPI (Universitas Pendidikan Indonesia - Indonesia University of Education)* is *Prodi Perpustakaan dan Informasi (Program Studi Perpustakaan dan Informasi - Library and Information Studies)* students. To obtain a positive impact from the learning process through English lectures to the students, for instance, a developed learning method through an appropriate approach is needed. The use of IBA (Interest-Based Approach) from Williamson (2008:16) has a potential positive impact in generating and keeping the ELLs' feeling of secure going. The feeling of secure on the students' part is worth maintaining throughout various kinds of sessions. Azis and Mahyudin (2014:43) put forwards that this condition will be reached when the students see a chance to express their ideas in the target language (English) without seen risks. When mistakes take place, ameliorating action should be triggered. The best way of generating the feeling of secure is by concealing any inappropriatenesses while at the same time offering betterments in a very polite manner. The feeling of secure kept going as the speaking activities at the school take place has a potential of accelerating ELLs' interest to use English while at the same time improving their ability to communicate better with peers and others. The lecturer as a facilitator should make every effort possible to prevent students from being revealed in terms of their mistakes. The effort made to

ensure students' unforced mistakes comes closer to perfection once an element of humour is inserted just to gear a positive impact of effective learning environments. The element of humour should be packed in such a way that the students will naturally respond to it and eventually burst into laughter. A facilitator can adopt a comedian's style of inviting laughter to enliven an atmosphere of cheer with live-warm-friendly learning activity through games, for instance. In an audiolingual method, interactive games are often used to motivate ELLs and set them free from satiation and boredom of routines in their daily practices of speaking in English. Munoz-Bazd's (2005:27) was quoted while saying *"The funny teacher is not a clown figure. He is a serious, conscientious professional who believes in the meaningfulness and effectiveness of having fun while learning"*. Humour is contagious and being released through antology to make it possible for the key points of learning materials to reach students' comprehension. Humour proves to be an effective way of mingling with ELLs (Hansen and Smith, 2002; Williamson, 2008).

Some sort of a second layer to strengthen the generated feeling of secure gained by ELLs is by inserting a degree of honesty on the facilitator's part. Parsons (2013) introduces a term of Teacher Demeanor (TD) to insert the honesty. TD is an approach characterized by repeated smiles with wholeheartedly facial expressions of cheer everytime any kinds of inappropriatenesses "performed" naturally by the ELLs take place. The inappropriatenesses come into existence in their various forms: misspronunciation with locality, choice of words with swerving their

meanings, grammatical usage with less than accurate formulas, expressions with more to eastern styles, and understandings on cultural aspects not yet absorbed as part of atheneness when communicating in English.

Communicating using English by students and some lecturers at the school takes place in a minimum frequency and, in one way or another needs to be spread for betterments. Its kind of expressing their ideas has been pushed generally by an obligatory, a must, a suggestion, pressures, a show (to express rank or standing), and a merely fun or joy. Communicating activities in the School (*Faculty*) of Education using English comprise English lectures, formal oral examination, discussion forum of *DIMBI* (*Diskusi Ilmiah Mahasiswa Berbahasa Inggris* – Students’ Scientific Discussion in English), role playing, individual or group talk, participation at international seminar, debating session, and student’s presentation at the yearly competition of Student Achievement Award. To a lecturer and an observer at the same time, every single word pronounced will be of importance to be appreciated. Results from this observation will eventually be the source of betterments in all aspects of learning in a wider perspective. The facilitator tends to be helpful in assisting the creation of burden-free atmosphere and will keep it going in a continuous mode. As a facilitator with efforts made wholeheartedly, the intention of helping in any way possible and giving appreciation to even mistakenly expressions will always be there. Expressing a statement of adore, for instance, is meant to trigger ideas and a means of generating confidence every time interaction in English takes place. The sign of adoring could be in the form of

an award or it could also be an abstract symbolic utterance for even every small effort made that has something to do with the attainment of learning goal. Hill and Flynn (2006) say that an appreciation (not a praise) given verbally proves to be more effective than an appreciation in the form of presents. Say, for example “*You’re a genius*” or, “*You deserve a Ph.D.*” *Shall we say?* while smiling wholeheartedly, seems so sufficient to the ELLs.

### **Potential of Producing Inappropriatenesses**

Inappropriatenesses (*the mistakes*, that is) often happen without the doer’s being aware. Efforts of generating betterments by the facilitator should always prevent the doer from being exposed to a situation that possibly reveals an embarrassment especially a very personal one. Those activities taking place in a classroom especially, a promising practical strategy should be applied (Dunlap and Weisman, 2007). “*Good morning, class! It’s always nice to be with you again*” might work quite well to start a session. The utterance initiated here functions as a way of throwing a feeling of boredom or a sense of being satiated away. Other than that, an atmosphere of freshness is expected to emerge – all of which should certainly be assisted by nice smile, sparkling eyes, and a little bit attractive gesture. If the facilitator intends to straightforwardly sacrifice himself, he might want to act like a trully comedian. Psychologically, the ELLs feel secure already and as a result they are sure they are freed from any kinds of intimidation. They will see a big chance to have an access to an enlightenment pleasing their hearts and to get rid of hesitation. That way, confidence goes

hand in hand with every single utterance when they feel the need to respond, ask, or even comment on the facilitator's opening session. Freshness created encourages enthusiasm that helps the emergence of confidence and, accordingly generates passionate admiration and interest on the ELLs' part. Enthusiasm is also believed to have a power of encouraging one to do things which were not interesting. In this case, ELLs' interest means a drive which is oriented to their needs. Eventually, the ELLs are motivated to undergo a learning process with enthusiasm. The motivation is not only geared by the ELLs but also by the initiative of the facilitator: willingness to involve wholeheartedly in the learning process for the sake of attaining the goal they wished to reach in the first place. Reaching their goal needs to be guided by way of keeping their feeling of secure going in any activities where English is used. ELLs learn how to communicate by involving themselves thoroughly. Hill and Flynn (2006:2) was cited when saying

*Language is the air we breathe and the water in which we swim. It comes as naturally to us as seeing the sky or digesting our food. It is as vital a part of our name and personality. But what if we suddenly had to breathe different air or swim in different waters? What if we consciously had to think about selecting the words we were going to say, getting them in the right order, applying the correct grammatical rules, and using the correct pronunciation? If we had to think about not only what we say but also how to say it, the language overload would be exhausting.*

How challenging using English when communicating is reflected by the above

citation. ELLs should indeed have vocabularies in a sufficient number and know something about grammatical rules such as the 9BP+3CCC (Cd, Cx, Cdx) and the PoS (Nine Basic Patterns of Sentence plus Compound, Complex, Compound Complex sentences) and the Parts of Speech, for instance, to equip themselves with before actually expressing their ideas in English at any performances at the school. Other than that, ELLs' knowledge of target culture (English, that is) play a great role as coined by Cakir (2006:77) "*Most frequently confronted that students to a great extent know the rules of language, but are not knowledgeable enough about the target culture.*" Both the languages, Indonesia and English – the source language (SL) and the target language (TL) – are a communication tool with two parallel streams which prompt to an awareness of a difference between the languages making it possible for any sociocultural and sociolinguistic constraints to hamper the communication. In the gap between the SL and the TL, there should be a stricture inserted to lessen the cultural barrier so as to make it possible for the communication to take place. As of the vocabulary, it has been proven that a sufficient amount of words would not be the only tool to express oneself to be accepted. Meaning on culturally loaded TL has to be offered to the party one is talking to. Evidence that the cultural difference between two different languages exists is that several languages have specific words for several concepts while other languages need to use several words to convey a specific concept (eastwood, 1982; Allyn, 2013).

In the English learning as a second language (ESL) as in Singapore, for instance,

ELLs are involved in English language in their daily life while in the case of English learning as a foreign language (EFL) as in the case of Indonesia, acquisition and the use of the language depends and is limited to the learning structure in the classroom with all of its impacts (Macau, 2003). According to Fodor (1974), the view which is general and logical in sense is that when ELLs express their ideas in English, they want to have their messages acceptable enough in the right way and not in the "right" way due to being incomprehensible culturally. It is true that one of the eight weaknesses in using a language is when an expression is uttered, emotional tendency and being swerved in nature often happens. An instructor with the capacity of facilitator needs to always make an effort to ameliorate in the light of TD the unforced mistakes done unintentionally by ELLs. TD approach sets ELLs free from the feeling of being intimidated and save their face as well.

Acceptance in the "right" way in the TL is coloured by an element of locality such as mispronouncing words. Jones (1978), an expert in pronunciation, comes to conclusion that *No two people pronounce exactly alike*. According to Jones (1978) differences among individuals exist from various causes such as locality, early influences, and social life of people living around a place forming certain environments. Not to mention individual peculiarities difficult or almost impossible to be discussed. A good example would be the locality as happened in, say, Bandung city of the Province of West Java. People, to be more specific, students of which their Sundanese accent is so strong, pronounce "f" instead of "p" and vice versa. When a word which has a "p" in it is to be pronounced, an "f" is heard such as in a word

of "people" which is pronounced "fifel" instead of "pipel". Students having a session in the classroom often burst into laughter when one student whose locality is so strong has to pronounce the sentence running like *It's very difficult to park my car in this parking lot*. It is exactly what other students with the same locality would pronounce every time consonant "f" or "p" is part of a word. Thus, a student might trigger some laughter when a phrase of *Novia Kolopaking* is pronounced *Nopia Kolofaking*.

### Efforts towards Betterments

Making efforts to make utterances sound as polite as possible will always bring with it some positive impacts. As a facilitator, giving bad remarks on student's language performance should be avoided. Gandi (2009) says it is a must to give remarks on student's work that will have a positive impact meaning that students should be freed from double burdens: linguistic shortcomings and less promising mental achievement. Therefore, if uselessness is what follows after the remarks or, even worse painfulness deep in the student's heart, giving remarks should be halted. Eastwood (1982) echoes that preventing ELLs from comments unlikely bringing positive effects is a brilliant idea. Someone has his own secret in his journey to master English but no one should reveal the secret for whatever reason. In his first three or four years of learning, having difficulties in grammatical structures and how communication works is common. To ELLs, empowering themselves through various opportunities of learning proves to be a certainty. ELLs need to be encouraged to adapt what they are really

interested in with the goals their facilitators are attempting to achieve. Through a cooperative learning technique, for instance, ELLs are offered to interact with each other in group activities to arrive at their learning intensity. Allen (1974:91) mentions some fundamentals as follows:

*The following general principles are self-evident:*

1. *All students want to speak, write and read the normal accepted English today.*
2. *This commonly be achieved by constant practice of existing forms, with some rational explanation of grammatical devices employed, whenever this is possible.*

It is true that basically ELLs want to have their English comprehensible in the TL when communicating. Nevertheless, to even make their English sound English, chances prove to be slim. Chances to practice the living structures used in communicating in a continuous mode seem to be scarce. In other words, a chance to see a room for involving themselves in interactive-communicative activities are sometimes hampered by the atmosphere of communication environments. Let alone when the practices need to be guided by rational explanation about grammatical formulas used. Not to mention the minimum amount of vocabulary they should have. The vocabulary they have to master functions as an important foundation as coined by Nation (2001:171) “ *A solid vocabulary is an important foundation for successfully mastering a new language*”. Alexander (1989) agrees with Allen (1974) that Students should be required to do a certain amount of extra work in his own time. As far as most instructors are concerned, suggestions to use English to communicate outside the classroom have

frequently been given, shown by examples, and even monitored in a tight manner.

A grammatical formula like  $9BP+3C$  (*Cd, Cx, Cdx*) plus *PoS* is abbreviated to make it easy to remember. The abbreviation stands for Nine basic patterns of Sentences plus three compound, complex, and complex-compound sentences. *PoS* stands for Parts of Speech (Noun-Verb-Adjective-Adverb) to enrich their vocabulary using prefix and suffix added to the root word (RW), like in *preRWsuf* (enRICHment). By way of such skill of combining all these elements, ELLs can make an analogy with a formula found in Chemistry. Part of the reason is that how a system in a language works has a little bit something in common with the formula used in Chemistry in terms of treating elements. Language also works with axiom in a light portion, one expert says. Through *Derivative*, for instance, a root word can be added with prefix or suffix and there goes a new word to be used in a sentence with different context and structure. Take *clean* (adjective and verb) as an example, can be enriched by adding *ness* to form *cleanness* (noun) or by adding *ly* to form *cleanly* (adverb). Enriching vocabulary may therefore be a lot easier for the ELLs to do with fun. Derivation helps students to express something the same in meaning but different in structure. With *beautiful* and *beauty*, for example, two sentences of the same meaning can be constructed: *Dwi Retno is the most beautiful girl here* and *Nobody has beauty here but Dwi Retno does*. If it has to be made “parallel” to the axiom in the Chemistry, according to a dictionary *derivative* is derived from something else, or *a word structurally related to another that can in theory be obtained from it and that is often used to verify the structure of the original*

word. There is another way of enriching vocabulary by making a “never-heard-before” word a bit more familiar with the ELLs through Key Word (KW) and Related Word (RW) approach. An example of a KW is *friend* – a word every student is familiar with. This KW has five RWs of similar meaning but not as popular as the KW. The five RWs include *ally*, *companion*, *crony*, *acquaintance*, and *confidant*. To the ELLs falling into the category of beginners, the five RWs could be brand new words and give no clues of how to use them in sentences. Towards the learning process, two factors namely being tough and patience are the key to enliven the spirit to gain more “new” words. Consulting a dictionary could be one way of knowing how to use the words precisely and, eventually would make it plausible for the ELLs to master sufficient amount of vocabulary. In brief, there are supposedly two main things ELLs have to own to get better in communicating their ideas for now namely vocabulary and grammar. Cultural factor is expected to be inserted as they go along with practices and first-hand experiences. The so called culture shock will be part of the facilitator’s task to handle by way of lessening it for the time being.

In a formal discussion taking place in a classroom, there goes an utterance *Hi, guys! How are you?* as an opening by a student to his classmates. The discussion is watched, evaluated, observed and commented by the facilitator. The opening remark has no problem with any incompleteness indeed, especially when the audience understand and is willing to share some nervousness. If the opening remarks had been “flavoured” with some elements of Grammar-Choice of Words-Culture (GCWC), the utterances

would sound a little bit more “delicious” indeed. The student in charge of leading the discussion would probably say something like *“Good morning, my beloved friends. Shall we say? How are you doing today? Feeling well, hopefully. Mmmh, good then!”*. At one chance given to the ELLs to play a role as a moderator, there still goes a student uttering *“Tell me the name before you ask a question, OK?”* as a substitute of probably *“It’s now time for an Q and A session. For anyone of you who is interested in sharing ideas, state your name first before asking a question or giving a response. Make sure the question is a question. Thank you”*. The following dialog reflects ELLs’ a bit less perfect attempt of running a discussion with “Stress at School” as a theme. There are seven students in their first semester majoring in Psychology. Around seven inappropriatenesses are found in the this short discussion.

- Tiara : “Hey how are you?”
- Dian : “Not good. I’m feeling so blue today”
- Dinda : “Why?”
- Dian : “You know what? I love one of our senior”
- Hasna : “Oh”
- Martina : “My”
- Rika : “God”
- Tiara : “Are you serious? Who is he?”
- Dian : “He is one of comission discipline
- Dinda : “ Who?”
- Wyddie : “Samsudin?”
- Hasna : “Darkosim?”

- Martina : "Or Jaenab?"
- Dian : "No! He is FRANDRI"
- Tiara : "How can it be?"
- Dian : "Based on my opinion he's so delicate. His face so sun bright like a diamond. I confessed my feeling to him last night. But damn it. He refused it."
- Rika : "Holy cow! I'm sorry to hear that."
- Hasna : "I knew, that was not easy"
- Dinda : "If I were you. I want never ever ever do that"
- Dian : "So what should I do than? I'm so stress today."
- Wyddie : "I see. Just forget the past. It's gone!"
- Dian : "I knew. I realized it's so ashamed."
- Tiara : "Just take it easy. Everythings gonna be okay."
- Martina : "Anyway, we have class so let us go now."

saying "Where are you?". The student should surely express "Where have you been?". She is not aware that all her friends are there in front of her, clearly seen. Nobody should be sought, whatsoever. "Where are you" denotes that somebody is looking for somebody else because of her being unseen. Another good example of inappropriateness for learning purposes is a short dialog between a student and a lecturer in a classroom. This ELL uses a group of words not common in English because of their being inappropriate. The ELL expresses "The name is also efforts, Sir" to convey a message in English "I was just trying, Sir". Other than making it English the wrong way, the ELL expresses an utterance that would not be acceptable in the native speaker's sense of meaning. To the facilitator, the expression might generate some laughter. That is why Balasko (2006) in Rusmono (2010) says "Students seem to find it difficult to compare and transmit two different systems of language and culture simultaneously". In a classroom session, a dialog using English has been directed to ELLs who have some familiarity with the language but lack in chances to practice it with intensity. The topic of the dialog should be controversial in nature so as to give a room for ELLs to get involved in the atmosphere of a debate (Moore, 1982; Franklin, 1990). A debating session serves as a very useful medium of expressions as coined by Rybold (2006:99) " Debating is a great educational opportunity and people like it because it is fun". Although, in fact, the facilitator guiding the activity should take an ounce of bitterness following the three-credit session.

All parts of the discussion above are performed exactly the same as the script the students write it themselves. The absence of punctuation marks like inverted commas, for example, is unedited and it is done on purpose for the sake of identification. A somewhat similar to the case in terms of GCWC is as follows. One of female students in a group, while opening wide her arms welcoming another group of female students

At a Library Tour (LT) for foreign students conducted in English by ELLs there

still goes utterance like “*Where are you come from? I am very interesting in this library, and Any question?*”. The tour leader of the LT probably wants to say “*Where do you come from or Where are from? I am very interested in the collections held by this library*”. Usually, an offer to ask questions is given in plural and is uttered in a complete form to keep politeness going like “*Do you have any questions? or Are there any questions?*”. Library Orientation (LO) and Bibliographic Instruction (BI) as the materials of the LT could be incomprehensible on the foreign students’ part due to such unEnglish utterances as shown above. To foreign students coming from English speaking countries like The USA and Canada, for instance, technical explanation on how to use electronic searching tools to access the resources could be unclear because of the explanation being not equipped with sufficiently appropriate diction. The following expressions are used by an ELL playing the role of a tour leader of LO and BI:

*Okey guys, this is Multimedia Room. There is place for browsing, searching, downloading, and typing. All facilities this room free for user. And this is postgraduate room. We can access in repository upi for see this collection. Now, we will wend second floor. This library have relict deposits. Okay, this is magazine and France Corner. This room will be relaxing for user. And than user can copy essay, thesis, disertasi and other collection in foto copy room. Free from copy can using preservation of collection.*

All parts of the script above are performed exactly as it is written the way they look. The purpose is to give a good example of how

incomprehensible an LT is conducted. The word *wend*, for instance, is uttered as it is in the written form. “*went*” is probably meant although it should be “*go*”.

At a formal examination of *Ujian Sidang Sarjana* to promote undergraduate students of the level of educational program in the department eligible to graduate, a simple question like “*Are you sure, your offer of applying such technique is promising enough knowing that instructors are usually find it a bit difficult to change their own ways of giving lectures?*” could turn out to be hard for the *examinandus* (the SNED student, that is) to grasp its meaning. The examiner was trying to test the *examinandus*’ knowledge using English to see whether the student can make his qualification meet the actual competency in the Era of Free Trade (and the university’s motto of *Leading and Outstanding*) he is going to face once he has to involve himself in the era of challenge. Answer to the question was *In my experience, teachers want to apply it* sound a bit Indonesian being mistakenly translated into English. Not only the pronoun *it* which does not represent the word *techniques* but also the phrase *In my experience* which is not in parallel with the words *teachers want*. The student would probably wants to say something like *As fas I am concerned, the informants of my research are willing to apply them (the techniques)*. Or, *Yes, I am*



*quite sure. To the best of my knowledge, the respondents show some willingness to apply the techniques. There's no doubt about it, Sir.*

At another chance in a Q&A (Question and Answer) session, a keynote speaker of an international seminar finds it rather hard to get the meaning of a question running like *"What could you relate between title from outside, grades, and behaviour for students?"*. Even though it is hard to draw the common thread from the question, the keynote speaker manages to entertain what is asked by the questioner (ELL, that is). At least, the keynote speaker would interpret *"How would you see any relationships between academic degrees earned from abroad and the behaviour of grading students' work among lecturers?"* before actually answering the question. The following question is short but sounds less accurate *"Can the best teaching method guarantee the best alumni?"*. The gap of diction between a sense of process and a sense of product seems to be too big for the speaker to handle.

Outside the classroom, at an activity of Student English Forum chaired by students (SNED students) of Library and Information Studies, various kinds of introducing oneself is heard. On interesting to note is *"Hi! I am Vinny. I live here in Bandung. Although my English is not very good, but I join this club to have fun"*. There is a possibility that the introduction is translating an Indonesian idea into English without carefully integrating grammatical elements to the expression. It seems like it is meant to minimally fulfill the need for information just to let people know something little about somebody. No signs of

interests are offered in terms of newnesses. No indication is found that the introduction would be continued in a more attractive and interesting way. It is therefore interpreted that no intention of giving signals that the first dialog could bring with it an impression of warmth and invitation to an even pleasing friendship. Vinny would need time and patience to reach a certain level of proficiency so as to have an expression more or less "right" like *Hi, there! My name is Vinny Pindiwiniti but you can call me Vivin. I am interested in joining with this club of conversation just because it looks good the way it is. It also sounds like fun when I see you all together in a harmonious atmosphere – chatting, laughing, and having all possible good times. In my spare time, I go swimming. Sometimes I swim alone, all by myself.* The last statement has every reason to attract interests and thus serves as a good start to build a relationship in a convenient atmosphere. At a glance, the case of mistake as shown above looks trivial, but a closer examination suggests that it inspires one to make some betterments. An alumnus' opening remark in his capacity as a moderator in an international conference needs to be polished because it runs like *"Welcome for Mr. X"*. The preposition used in the remark should not actually be there. Or, a candidate for The Best Educator at a faculty level who speaks in English with difficulty when answering a juror's question. The candidate's competency of English should actually be in the category of "speaking effortlessly" already.

### Conclusion

Making efforts to elevate any good intentions of the ELLs to use their English the proper way will never be futile. The facilitator

approaching them with enthusiasm results in positive responses and more than likely would end up with betterments in various forms. Rooms created for the ELLs to fill the gaps may still be far from being perfect, but at least an initiative has been launched and will hopefully lead to a much more promising future. Giving credits to ELLs for any drives of speaking even in a need-polishing-English proves to be useful. It leads to an emerging self confidence on the ELLs' part and eventually will generate more understandable utterances. Varieties of social, cultural and economic backgrounds will not contribute that much to hampering possibilities and therefore ameliorating constraints to effective learning will be beneficial. Temporary “negligence” to linguistic standards has resulted in a conducive process of learning English as a foreign language. Replacement of the negligence by the facilitator's artificial conduct of enlightenment pushes ELLs to perform with confidence and with the feeling of being not intimidated by risks. Benefits are the ELLs to get since continuous efforts of creating pleasing atmosphere by the facilitator are made. The impact is obvious: an initiative of communicating in English with confidence and risk-free attempts. The impact is potentially promising in terms of developing and implementing innovative instructional programs for the SNED ELLs.

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## Decreasing Teacher’s Burden in Designing Fun Learning Through Lesson Study

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**Abstract:** Teacher has a great responsibility in conducting teaching learning activity in a class. Before teaching a class, teacher should make preparation of lesson material and media that will be use in the class. Teacher has to decide what kind of learning technique will use to deliver the teaching materials as well. This important job is not only done once, but every time they have to teach in the class. It means they have to arrange it for a whole semester. This is not an easy job indeed, especially if the teacher never taught the subject before, or if the book and technique that usually use are change in order to get a better education result. This paper is about teacher’s efforts in designing fun learning with quality in speaking subjects, particularly dealing with designing a better lesson plan, lesson material, and media which conducted through Lesson Study. The author tries to describe based on her own empiric and observation data during the process. The aim of this paper is to share information and findings of how Lesson Study could help to decrease teacher’s burdens in designing a better teaching learning. The result of the observation indicates that Lesson Study could help teacher to (1) decrease teacher’s burdens in designing a better teaching learning especially for the teacher who never taught the subject before, because the teacher not work alone (2) help teacher in increasing knowledge of resource books, (3) teacher could learn how to deliver the lesson materials by employing a better teaching technique from colleague or observer, (4) by conducting lesson study continuously, teacher become trained to evaluate a teaching learning process, (5) teacher model and observer should change their role in order to maximize collaborative working. A suggestion coming out of the above findings is Lesson Study could help teacher designing a better fun learning.

**Keywords:** lesson study, designing

### 1 INTRODUCTION

Education is the most important things to build a community. Education aim at improving the quality of education, so can create the human resources that reliable either in the field of academic, socio-personal, or vocational. Many people of Indonesia expect the quality of education in every educational institution be increase. Not only curriculum and facilities, even educators are expected to improve their learning quality.

Therefore in 2005, The Government and The House of Representatives had legalized The Act RI no 14/2005 about teachers and lecturers act. It is mentioned that the teachers and lecturers have to work professionally in order to improve the quality of education. The type of competences referred to this Act includes pedagogic competence, personality competence, socially competence, and professionalism competence.

To improve the professional and qualify educator, teachers who are competent in their field and the high-quality education are require. Various ways can be done to achieve this aim. One of them is lesson study. Lesson study is expected to help the development of teachers in

order to get maximum result for both teachers and students. Why? Because lesson study is an effort to improve the learning process and the result, which is implemented collaboratively and sustained by a group of educators, based on mutual learning principles and building learning community for all those who involved in it.

Through Lesson Study, several student and teacher’s problems in teaching learning, bit by bit can be overcome. Include teacher problem in design a learning.

In carrying out the duties, teacher has a great responsibility in conducting teaching learning activity in a class. Before teaching a class, teacher should make preparation of teaching materials and media that will be use in the class. Teacher has to decide what kind of learning technique will use to deliver the teaching materials as well. This important job is not only done once, but every time they have to teach in the class. It means they have to arrange it for the whole semester. This is not an easy job indeed, especially for the new teacher or if the teacher never taught the subject before or if the book and technique that usually used are changed in order to get a better education result.

As happened on the speaking subject for 2<sup>nd</sup> semester (2 credit). I was given the task of

teaching this subject in last semester (even semester 2013). Based on the evaluation/discussion at the beginning of semester, the lesson material should be changed. Because it requiring to be adjusted with material in grammar subject (6 credit). Consequently, lesson material that should be taught in speaking subject is 20 chapters and must be settled in 14 weeks. It means the materials, media, syllabus, and lesson plans must be renewed. This was a heavy burden for me. I have never taught this subject before. If I have to work alone in preparing and carry out the lesson, can be imagined how complicated it would be? Every week I have to make new media and preparation for teaching alone. I was lucky because my team teaching is native speakers of The Japan Foundation. *Jugyo kenkyu* that we did could overcome these problems. This is called as lesson study.

This paper is about teacher's efforts in designing fun learning quality in speaking subjects particularly dealing with designing a better lesson plan, lesson material, and media which conducted through lesson study. The author tries to describe based on her own empiric and observations data during the process. The aim of this paper is to share information and findings of how Lesson Study could help to decrease teacher's burdens in designing a better teaching learning. Because the teacher usually thinks that the lesson plan, teaching material and media they made was good enough and could delivered smoothly. But sometimes revise is necessary.

## 2 FINDINGS AND DISCUSSION

### 2.1 What is Lesson Study

Lesson study is a simple idea. If you want to improve instruction, what could be more obvious than collaborating with fellow teachers to plan, observe, and reflect on lessons? While it may be a simple idea, lesson study is a complex process, supported by collaborative goal setting, careful data collection on student learning, and protocols that enable productive discussion of difficult issues. (Catherine Lewis, Lesson Study: A Handbook Teacher-Led Instructional Change, 2002).

The point is lesson study is one of the efforts to improve learning, by conducting collaboration with other teachers to design, observe, and do reflection on learning process.

Lesson study is derived from Japan (*jugyo kenkyu*). This activity used by Japan teachers to test the effectiveness of their teaching with the aim to enhance learning outcomes. The idea of lesson study is teacher can collaborated with

other teachers to develop a lesson plan, media, observation, reflection, and revising lesson plan continuously. Because good instructional design, sometimes not necessarily succeed as assumed by the teacher. Depend on the reaction of students.

There are four major purposes that motivate lesson study: (1) to understand better how students learn what you teach. (2) To create usable products for other teachers in your field. (3) To improve teaching through systematic, collaborative inquiry. (4) To build a pedagogical knowledge base in which teachers can benefit from one another's knowledge of teaching. (Bill Cerbin & Bryan Kopp. A Brief Introduction to College Lesson Study)

This complex process should be done continuously because of several reasons they are: (1) there is no excellent education, (2) each student has the right to learn, (3) learning must considering the balance between increasing of thinking ability and manner, (4) learning should be centered on students.

Study the lesson aim to find solutions for the problems of learning as to improve the quality of learning. The study lesson can be done towards lesson material, the learning method, worksheet, the learning media, or assessment. Why study the lesson conducted in collaborated? Because the more input the more quality of learning will improve.

### 2.2 Why Speaking Subject Need Lesson Study

As an institution of higher education which are responsible for generating the output of skilled teacher and able to teach Japanese in high school, Japanese Language Education Department of Semarang State University was trying to improve the quality of learning by improving the curriculum and its content. Include speaking subject for 2<sup>nd</sup> semester.

Actually the speaking subject given to 6 semester (I-VI). But since I only had to teach the speaking subject at basic level students (2<sup>nd</sup> semester), this paper is simply conveys information from observation results towards Lesson Study conducted on that speaking subjects only.

Based on the results of evaluation/ discussion conducted at the beginning of the semester, it is known that the material being taught on the speaking subjects disproportionate to the material on the subjects of grammar, whereas both of these courses use the same textbook, i.e. Minna no Nihongo. This is due to the difference in the amount of credits. Speaking, 2 credits (the material carried only chapters 1-13), while

grammar, 6 credits (the material read by chapters 1-16).

As a result, the remaining 3 chapters haven't taught in the speaking subjects. Therefore, in the next semester, I and my teaching team have to teach 20 chapters (14-33 chapters) in 14 weeks. Until the midterm, we must combine 2-3 chapter becomes 3-5 media and worksheet. This means that the syllabus, lesson plan, material also have to be renew. That is in contrast to a year ago. We have to make preparation in each week through Lesson Study.

Why the new syllabus, lesson plans, material, and media must be renew? During the last two years lesson plan and lesson materials was taken from some resource books. Actually it was good, but at the beginning part, students just practicing utter or repeating a sentence instead of practicing the actual conversation. In addition, due to difference credits. Hence, the material disproportionate to the material on the subject of grammar.

### 2.3 The Process of Lesson Study in Designing Fun Learning

Because of limited time and human resources, lesson study on speaking subject for the second semester only done by the teaching team, which is consist of 2 teachers. One is teaching while the other is observing. We decided to do the role interchangeable. Why? Because we had 3 classes and 2 hours weekly meeting on Thursday. We will be very exhausted if we did the teaching and observing 3 times in a day. And since my partner (co-working observer) determined to seat in another subject course on 15.00 p.m., then we exchanged and determine the schedule as follow:

No	Class	Schedule	Teacher	Observer
1	First class	Thu 7.00-8.40 am	S/D	D/S
2	Second class	Thu 11.00-12.40 am	S	D (optional)
3	Third class	Thu 15.00-16.40 pm	D	-

Fig.1. Lesson Schedule

Thus, lesson study is only done every week in first class. While in the second class is optional. The third class only observed in first 2 weeks, after that, I was taught alone without being observed.

The lesson study process that we conducted is consists of 5 steps as seen in this picture below:

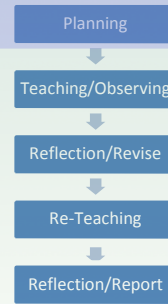


Fig.2. Lesson Study process in speaking subject (modified from Fernandez and Yoshida, 2004: 32)

#### Step 1. Planning

Lesson Study activity start from planning stage, namely design the lesson that centered on students, how the student can participate actively during the learning process. In this stage, teachers collaborate to enrich ideas on developing better lesson plan and media.

By collaborate, both of us choose topics which will be learned in one semester. This topic selected based on current curriculum. Next, we made the syllabus that consist of 1) the learning purpose of speaking for basic level 2) the learning purpose of speaking for the student of second semester, 3) assessment, 4) units, 5) an explanation of how this lesson will perform by teacher.

The teaching order determined by drawing our past experiences, teacher's guide, textbooks, and other resource books. The bottom line, it is important to design a learning which makes student active, happy, not bored, centre on student, and capable of making a simple conversation.

From this collaboration result, both sides got input about source books that suitable to use in speaking subject for basic level, and how to convey the lesson material with a more attractive method. This is an advantage that teacher could get. We finally, assign one book as the main textbook. As for the additional material, we use 3 other books. We also made the conversation text by our self.

After that, we agree to meet again to discuss the lesson plan. We decided that lesson plan made by teacher that will teach. The Following is one of activity schedule for planning stage.

Planning Activities 2 <sup>nd</sup> week	Date	Activities
	7/3/2013 Fri	Teacher who will teach developed preliminary lesson plan, created lesson material & worksheet
	10/3/2013 Mon	Teacher who will teach presented the lesson plan, followed by discussed and received feedback
	11/3/2013	Teacher who will teach revised the lesson plan, lesson materials, and

Tue	prepare to teach the lesson (with help from the team/observer)
13/3/2013 Thu	Teacher taught the lesson. The other teacher observed the class

Fig.3. Planning phase on lesson plan

The example of lesson plan that I made is as follow:

- 1) Instructor: Dyah P
- 2) Subject: speaking (kaiwa shokyu kohan)
- 3) Date & Time: March 13, 2013 (Thursday)
- 4) Semester: 2 / first class / 14 students (4 boys, 10 girls)
- 5) Name of the unit: Te kei, te kara
- 6) The goals of the unit: student can speak with the right expression that appropriate with the situation, and also can make a short conversation.
- 7) Plan for the unit (lesson 16)

**Section 1:** review student's comprehension of last week material by role play. Assess.

**Section 2:** ensure student understanding about “-te-“ and “-tekara-“ patterns. Develop student's mastery by making a short conversation that appropriate with the picture.

**Section 3:** to foster a better understanding of grammar and natural conversation by exercise in pairs, using pictures.

**Section 4:** apply the “-te kara-“ pattern by interview activity

**Section 5:** to exercise student's pronounce by reading a long text of conversation (lesson 16). Work in pair.

The feedbacks obtained are as follow:

- Students may be directly utter the sentence only base on picture they see. They will probably not make a natural conversation. Therefore teacher should give clue so students can say the opening and ending sentence of conversation that fits with the situation in pictures, for example: “sumimasen”, and “iidesune, itsuka isshoni..mashouka” in order to make the conversation becomes more natural.
- Grammatical corrections
- It will be meaning full learning if student can make their own long conversation by modifying the long conversation text with their own words or situation.

So, the **section 5** revised as follow:

To exercise student's pronounce by reading a long text of conversation (lesson 16). And to review what the

students have learned by modifying some words or situations in the conversation text, so it will be easier for students to memorize and then present their own conversation. Work in pair. Student will **get extra point** for the presentation.

The discussion and feedback provide good input for both of us such as: share ideas, corrections on grammar, correction on the content of lesson plan, knowing the strength and the weakness of the lesson plan, knowing how to develop lesson plan becomes more meaningful learning.

### Step 2: Teaching/ Observing the Implementation of a Lesson Plan

The second stage is teaching and observing. Teachers implemented the learning by using revised lesson plan. One of the teacher in the group taught the lesson to students. Other teacher observed. The observer came to the class with the lesson plan in hand, which they use as a tool to guide what they look for in the lesson.

Because the observer got turn teaching in second class, the observer really focused on observed the learning. Especially on student response, as well as the strengths and weaknesses of the lesson plan.

I think this is also the advantage of the exchange of roles between the teachers who teach and observer. In the end, this can help maximize collaboration when designing the lesson plan. Maybe if we work alone in the class, we can't see all the student's difficulties in detail. That's why we need co-worker to observe our teaching learning process, including our technique, material, and media.

### Step 3: Reflection/ Revise

Reflection immediately conducted after complete teaching/ observation. The discussion begins with convey impressions when teaching. The observer then delivered comment on students, such as when students can follow the lesson, when student less able to follow lessons, give advises to add/ reduce/ convert lesson plan and media.

Through this discussion/ reflection activities, teacher who teach could know about student behavior in the classroom in details. Usually, teacher only teach and pay attention to the reaction of some students in the classroom. Not too detailed. Just pay attention to some students he/she knows as smart/not smart, less active/silent during group work. The bottom line, there is an increase in lecturer's ability on observing the learning. The strengths and

weaknesses of lesson plan can also be immediately known and revise and then implemented in the next class.

Feedback obtained are:

- In section 2, the student is difficult to interpret the image, making it somewhat difficult to make conversation and taking time. Teachers should provide many clues.
- Teacher should provide more pictures so the students trained to make conversation. However, the allocation of time for section 2 needs to be added.
- Automatically, section 3 should be more shorts in time by reduce the picture

Based on the feedback above, we revised the lesson plan for the second and third class. This reflection phase always produce the final revision of the instruction. The revision becomes external product that can be used for an extended period of time as long as in accordance with the curriculum, student conditions, as well as the campus environment.

#### Step 4: Re-Teaching

Because the lesson plan had been revised, usually teacher can teach the second and third classes better. Moreover, the teacher has already seen the way to convey the lesson.

Although the lesson plan had been better, there is still possibility of revise again due to several factors. For example, student's responses are different, the amount of students in the class is not the same, the physical conditions of students in first class differ with third class, et cetera. This kind of things usually discussed further in reflection stage.

#### Step 5. Reflection (Optional)

After teaching the new version of lesson plan, we also do reflection/ report optionally. Particularly if there is any problem or change in second and third class. It is possible if it didn't go well because the condition/ response of students are not the same.

In the second week, feedback that obtained by team are:

- Since the amount of students in second and third class are 23 and 25 (more than first class), section 1 take longer time than allocated time. As a consequence, unfortunately, in section 5 only a few students can get the chance to present the conversation. Whereas they got extra points if they present. This problem should be thinks

further to find solution for the next semester.

- Because students already attending the class continuously from 07.00 a.m., students are very tired. As a result, the response of student in third class slower than the first class.
- Moreover, while doing the section 5, students are not very active. These problems should be thinks further to find solution for the next semester.

### 2.4 The Benefit for Teacher

Based on my own empirical experience and observer's notes, the advantages of this kind of lesson study obtained for lecturer are as follows:

- At the beginning, teacher collected knowledge, then working in collaboration. This activity enriched teacher ideas and knowledge about sources book, learning techniques, and media. That could produce a better lesson design than done alone.
- Compare with my last experience in other subject, I did not create the lesson plan by lesson study before. Lesson plans, materials, and media are already available. My job just seat in at first class only, then taught in second class. So, I didn't experience the process of revising the lesson plan.
- Since there is an exchange of role/turn (as teacher and observer), the task of creating a lesson plan and media in each week was performed alternately. Since the lesson plans made by lecturer who will teach, this could decreasing the teacher's burden. Because teacher doesn't have to create lesson plans alone and don't have to make it every week. If lecturer have to make it every week, and also for some other subjects, perhaps they won't have enough time to make a research and community service. Though it includes basic tasks of a lecturer called Tridarma College. Thanks to Lesson Study, this burden can be reduced.

### 2.5 The Impact on Student Learning Activity

The observer noted that the impact on student learning activities are as follows:

- All students pay attention to the lecture and lesson from beginning until the lesson finished.
- During Q & A activities on section 2, only a few students could answer the



questions. But when they work in a pair (do the conversation), all students become active.



Fig 4. How lesson study can change the student

- Most of the students are active during the learning process. The average of their daily activeness is achieved 70 points. It seems impact on their mid-term test, they got good score (the average is 82.65) and in end-semester test their average is 80.48. It can be says that the result test is quite good. Most of the students who active in daily class activity, achieved high score.

The overall process of this study lesson (jugyo kenkyu) has helped reduce the burden of teachers in designing learning. Because no longer work alone. Teacher gets help from team teaching/observer.

If the lesson study process do continuously, and do the exchange role between teacher and observer, then a lecturer will be trained to evaluate a teaching learning process. So they become more sensitive toward student's response and lesson plan that they get involved in design it. Although can't be detail just like the observer did.

### 3 CONCLUSION

Based on the result above, it can be concluded that the result of the observation indicates that Lesson Study could help teacher to:

- (1) Designing better fun learning. Collaboration with the team can help to decrease teacher's burdens in designing

a better teaching learning especially for the teacher who never taught that subject before, because the teacher not work alone.

- (2) Help teacher in increasing knowledge of resource book
- (3) Teacher could learn how to deliver the materials by employing a better teaching technique from colleague or observer,
- (4) By conducting lesson study continuously, teacher become trained to evaluate a teaching learning process,
- (5) Teacher and observer should change their role in order to maximize collaborative working.

A suggestion coming out of the above findings is that lesson study could help teacher designing a better fun learning. Lesson Study can apply in every week. But if it applies in university level, the obstacles in each University are necessary to be consider and look for the solution.

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## Dynamic Intellectual Learning As an Adaptive Learning Model in Lesson Study

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**Abstract:** Dynamic Intellectual Learning (DIL) is one of the adaptive learning models which is an improvement of e-learning system. DIL can lead learner to access the learning content that is suitable with their prior-knowledge. There is a principal distinction between DIL from e-learning system. DIL has a pre-test which is conducted before the learner can access the learning content, after which the system will then provide guidance for learner to access an appropriate material based on the result of the pre-test. After the student finishes accessing the learning content, the learner will be given a post-test by the system to decide whether the learner can access the next level of the learning content or they should go back to the previous learning content. This model is expected to cover the weakness of the conventional learning model, in which the learners study the same material without considering their prior-knowledge. DIL has been implemented in the Psychology of Child's Education course at the Department of Primary School Teacher Education, Ganesha University of Education as a pilot study. The present study involved 44 learners as samples. Based on this study, it was found that the learners have a different numbers of accesses in order to pass the 14 learning contents in one semester. 2.56 % of the learners required 8 times of access, 12.82 % needed 14/15/16/19 times of access while 2.56 % of them needed 23 times of access to be able to complete every material provided. This study demonstrate that not every learner needed 3.5 months (14 sessions face-to-face learning process) to understand all of the learning contents in one semester, compared with that of the conventional learning. The remaining time that these faster learners have after completing the lessons can be employed by the students to master enrichment materials or entrepreneurship skill. The most critical thing in DIL is the instrument which is used to measure the learner's ability to understand each material, so that the system can put the learners into the right learning content.

**Keywords:** Dynamic Intellectual Learning, Prior Knowledge, e-Learning, Adaptive Learning, Learning Model.

### 1 INTRODUCTION

Ganesha University of Education (GUE) is concerned with the development of ICT and its application of learning system as an effort to increase the competence for becoming a center of excellence. This was realized with the establishment of the Department of Information Management (D3) and Information Technology and Computer Education (S1), expected to develop a program of institutional consolidation in the form of utilization of ICT in the education system.

In the future, with the era of globalization, college graduates will not be just competing with the domestic labors but also with the foreign labors. That is a challenge for GUE as one of the higher education institutions for delivering graduates who can compete in the global market. From this perspective, GUE is expected to shift the learning paradigm from faculty teaching into student centered learning by applying

Dynamic Intellectual Learning (DIL) based on ICT which oriented on prior-knowledge of each learner.

DIL will provide an opportunity for users (students) to access a course material in accordance with their respective abilities. The students with better abilities than the others will have the chance to explore the course materials more quickly with the chance to have enrichment afterwards. It means each student will not have to face the same material. The system will immediately analyze the capabilities of each user. It will not be obtained in the conventional learning (face-to-face in the classroom), where the students will get the same course material or treatment despite of their prior- knowledge.

A research has been conducted to develop the prototype of Dynamic Intellectual Learning. However, the model has to be tested both in terms of the system, which concerns about the user interface, the performance and stability of the system, as well as learning content. Apart from the system, testing

should also be done from the model that will be applied. On this study, we focus on implementing the DIL system in order to know the benefit and efficiency of DIL Model.

DIL is the improvement of e-learning system which was widely applied in various educational institutions both formal and informal. DIL is oriented to prior-knowledge of each learner so that it can be accessed without limited by time and space, thus it can provide an opportunity for users to access different materials according to their respective capabilities.

One thing to be noted is that the implementation of e-learning system is not only able to transfer the knowledge from the educational institution to the students, but it can also facilitate the interaction between students and teachers and between students themselves which can build an academic atmosphere and develop critical and analytical thinking to solve problems among the students.

## 2 DYNAMIC INTELLECTUAL LEARNING (DIL) SYSTEM

Dynamic Intellectual Learning (DIL) system is the improvement of e-learning system which is now widely implemented in several educational institutions both formal and informal. DIL will provide the opportunity for learners to explore the course material in accordance with the prior knowledge of each student. In general, implementation of e-learning system does not consider the prior-knowledge of the learner. The steps performed in the DIL method are as follows (Dantes, et.al. 2010).

### 1. Pre-Test

The student has to take a pre-test before they can have the chapter from the learning content. There are some requirements, such as: (1) pre-test consists of questions that represent each chapter; and (2) the pre-test's result indicates if student pass or does not pass that chapter. The purpose of pre-test is to determine the prior-knowledge of student, therefore the system can assign the student to the chapter that suits with his/her capability.

### 2. Choosing the Learning Content

The student can choose the learning content that has been posted. Yet, the system will check whether the student needs to take certain chapter or not.

### 3. Taking the Chapter

There are two conditions in taking a chapter of learning content. First, the student is free to choose the chapter. Second, the student has to take the chapter that has been decided by system, since the student has not passed the test session yet.

### 4. Taking the Test Session

After choosing the chapter which is decided by system, the student has to take the test session before they can exit from the chapter and continue the learning process. From this activity, some possibilities can happen, such as: (1) the student can pass all the chapters; (2) the student cannot pass certain chapters or all chapters. If this is the case, the system will assist them to take the smallest chapter.

The learners are only given the opportunity to repeat the session 3 times. After three attempts, students are no longer allowed to take the chapter and also should not take the related chapter relating to the chapter that they did not pass. In other words, that chapter will be locked. The process of Dynamic Intellectual Learning is illustrated in the following figure.

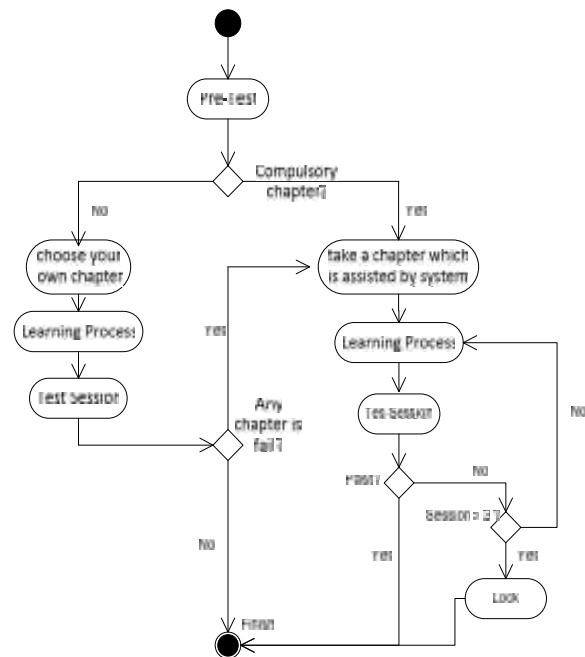


Figure 1. Flow of Activity in Dynamic Intellectual Learning

### 3 RESEARCH METHODOLOGY

This study used prototypical study type which is one of research and development design. This technique was proposed by Akker (1999). The most important thing that need to be considered in developing research is the quality of the learning model or the product. Research population was lecturer and students at Ganesha University of Education, with the Primary School Teacher Education and Guidance & Counselling Department as the departments enrolled as the pilot project of this study.

Dynamic Intellectual Learning System was developed using a prototype methodology. It is one of Software Life Cycle Methodology. The methodology contains of 5 steps, namely: system requirement, system analyst & design, prototyping (model development), evaluation, and implementation.

The instrument used on this study was validated using item test for determining the level of reliability and validity. However, we also need to do the continuous validation both empiric and expert judgements.

### 4 RESULT AND DISCUSSION

#### 4.1 Implementation Of Dynamic Intellectual Learning System

On this study, we focus on implementing of Dynamic Intellectual Learning as an adaptive learning. We used a Psychology of Child’s Education course as a pilot study on implementing DIL system. There were 44 students involved on this research from Primary School Teacher Education Department.

The learning history from each student in using DIL system was recorded. DIL system was implemented starting from August until October 2011. The data gathered from this study were then analysed using descriptive statistic. This study describes the implementation result of DIL system. It can be used as one indicator to know the benefit and efficiency of this system.

From 44 students who enrolled this course, 5 students failed the course while the rest of them passed it. In this study, collaborative method was implemented, in which conventional and DIL system-supported online learning.

A student can be cleared as passing the course if they have taken the entire chapters (14 chapters) and they finish all of them in accordance with the standard requirement needed by each chapter.

### DIL System Implementation

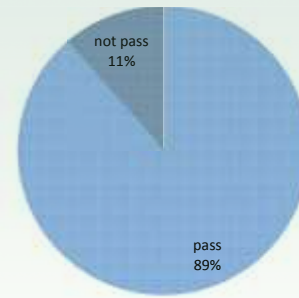


Figure 2. Result of DIL System Implementation (August – October, 2011)

Five students who failed the course during the experiment with different diagnoses. One student stopped at chapter one, because he/she could not continue to the next chapter. One student stopped at chapter 5, two students stopped at chapter 7, and one student stopped at chapter 9. The figure below shows the different achievements among these five students.

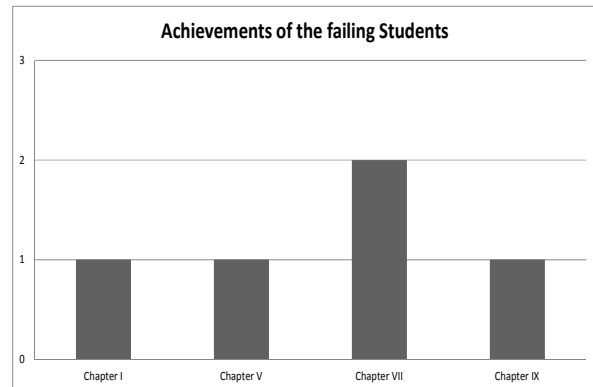


Figure 3. Achievements of the failing Students

Achievements of the students who succeeded in passing all of the chapters also varied, along with different number of access to the system (table 1). The number of access needed to finish the entire chapters can be used as an indicator to show how fast the student can master the learning content. It is determined by the student’s prior-knowledge and their intellectual quotient (IQ).

The average of students’ access number in order to understand the learning content was 17 times. The table below shows that only one student can finish the entire chapter within 8 times number of access, while one student needed 23 times of access to finish all of the chapters provided. That means, each student needed different times to understand the learning content.

Table 1. Number of DIL Access for Mastering the Entire Learning Material

No.	number of access	number of Students	Percentile	Remark
1.	8	1	2,56%	Pass
2.	10	1	2,56%	Pass
3.	13	3	7,69%	Pass
4.	14	5	12,82%	Pass
5.	15	5	12,82%	Pass
6.	16	5	12,82%	Pass
7.	17	4	10,26%	Pass
8.	18	1	2,56%	Pass
9.	19	5	12,82%	Pass
10.	20	4	10,26%	Pass
11.	21	3	7,69%	Pass
12.	22	1	2,56%	Pass
13.	23	1	2,56%	Pass

More explanation about the number of access is described in the following diagram.

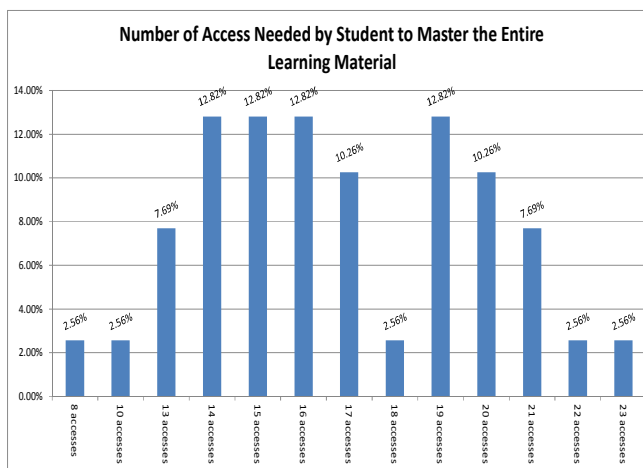


Figure 4. Number of Access Needed by students to Master the Entire Learning Material

## 5 CONCLUSION

Based on the explanation above, it can be concluded that 39 students (88.64%) finished the entire chapter while 5 students (11.36%) failed from the total 44 students enrolled in the experiment. Each student had a different number of access of learning content. It shows that each student needs different number of time to understand the material. Therefore, each student should be given different treatment for understanding the learning material. The fast learner will spend less time in finishing the entire learning material and thus can proceed to enrichment content.

From 39 students who could finish the entire chapters, only 1 student had 8 access of time which is the smallest number of time to understand and pass all the evaluation on each chapter in this study, while 1 student had 23 times of access as the biggest number of access in this study. The average of number of access is 17 times.

The students who failed in finishing the entire chapters also showed different levels of understanding. Among them, 1 student had to stop at the first chapter, 1 student had to stop at chapter five, 2 students had to stop at chapter seven, and 1 student had to stop at chapter nine.

This result indicates that when a class applies the DIL system to deliver 14 chapters, the class does not need 14 times of classroom meetings like a class applying conventional teaching would.

Thus, by applying DIL system, some students can learn and understand the entire chapters for one semester in less than the allocated 14 meetings. Some students may need more time than the others and this indicates that the DIL system also provides flexibility to the students to access the learning materials according to their abilities. Such flexibility is not available in a class applying conventional face-to-face meeting. For students finishing earlier than their peers, they are not only benefitted from economy of time in mastering the target learning material, but they will also be benefitted by the possibility of learning more through enrichment materials after finishing the required chapters.

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## Engaging in Lesson Study to Gauge Instruction of the Fundamental Counting Principles as an Introductory Topic On Probability

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**Abstract:** Introductory lesson for topics in mathematics is crucial part for students' learning. Lesson study can strengthen a lesson as it is essential in developing the quality of lessons in mathematics. In addition, productive pedagogy can be a tool to support and further enhance and achieve the goals of the lesson study. This paper presents how the instruction of the Fundamental Counting Principles (FCP), an introductory topic on probability, can be developed and improved in terms of the activities used. Guided by the principles of lesson study and productive pedagogy, the authors aim to carefully reflect on, study and evaluate the effect of these activities to students' engagement and learning of the research topic. This also includes the results, conclusions and recommendations of the graduate students of De La Salle University-Manila, taking up a course on Teaching of Mathematics.

**Keywords:** Lesson Study, FCP, counting principle, probability

### 1 DESIGNING LESSONS IN PROBABILITY

“As with other beautiful and useful areas of mathematics, probability has in practice only a limited place in even secondary school instruction” (Moore, 1990, p.119). Since the late 1950s, there have been strong calls for an increase in the inclusion of probability in the K-12 mathematics curriculum (NCTM, 2000). Probability has come to gain importance as a content area that students need to have experience with in order to be well-informed citizens since its study “can raise the level of sophistication at which a person interprets what he sees in ordinary life, in which theorems are scarce and uncertainty is everywhere” (Cambridge Conference on School Mathematics, 1963, as cited in Jones, 2004).

In the Philippines, for example, the teaching of probability and statistics is part of the mathematics curriculum for elementary and secondary schools. In today's Age of Information, the introduction of these topics into the school mathematics curriculum is viewed as part of basic literacy in mathematics

needed by all citizens (Garfield and Ahlgren, 1988). Batanero and Diaz (2011) summed up the reasons for inclusion of the study of probability in the primary mathematics curricula in many countries in terms of the usefulness of probability for daily life, its instrumental role in other disciplines, the need for basic stochastic knowledge in many professions, and the important role of probability reasoning in making judgments and decisions under uncertainty. Moreover, there are a number of issues and concerns raised by statistics and mathematics educators and researchers which posed challenges in the teaching of probability. One of which is to teach his subject matter in order to enable students to understand and apply it, by creating approaches that are both accessible and motivating (Borovcnik & Kapadia, 2009). As cited by Taylor (2010), another challenge to its pedagogical success is to relate to children and engage them in learning experiences in which they construct their own understanding of probability concepts.

Since it is also at the secondary or middle school level that the basic ideas about elementary probability are consolidated and more sophisticated concepts introduced for the first time, teachers must

be well prepared on how these concepts will be understood by the students in an accessible and motivating manner – starting with the most basic topics which also seemed to be the most crucial part of any kind of learning. As experienced by most of the authors of this paper in their own secondary classes, the Fundamental Counting Principles (henceforth, FCP), as an introductory topic to probability, was taught to students in a formula-based approach; that is, usually the mere multiplication of numbers, which then possibly allows students to do number-crunching. As mentioned by Garfield and Ahlgren (1988), students often tend to respond to problems involving mathematics in general by falling into a “number crunching” mode – plugging quantities into a computational formula or procedure without forming an internal representation of the problem. This student practice then poses a setback on both the teaching and learning processes. Moreover, the concept behind the FCP as such, as the authors believe, was being taken for granted and the students’ learning became susceptible. With this, the authors considered this problem and felt the need to find ways on how to improve pedagogy on the said topic.

Garfield and Ahlgren (1988) reviewed literature related to difficulties that precollege and college students have in understanding probability and statistics and made several recommendations for overcoming these difficulties which include, among others, the following: introduction of topics through activities and simulations rather than through abstractions, motivating students to see useful relations of mathematics to reality, use of visual illustrations and exploratory data methods and the creation of situations requiring probabilistic reasoning that corresponds to the students’ views of the world.

## 2 LESSON STUDY AS COMPLEMENTED BY PRODUCTIVE PEDAGOGY

As stated by Ball (2000), understanding the subject matter is essential for teachers listening flexibly to others and being inventive in creating learning experiences for a variety of students. Furthermore, since students build their knowledge in an active way, by solving problems and interacting with their classmates, we should present future teachers with some activities based on a constructivist and social

approach to teaching (Jaworski, 2001). As stated above, the researchers used problem-based activities, a constructivist approach to address the objectives intended for the research lesson on the fundamental counting principles.

Japanese lesson study has been a popular professional development approach in recent years (Stigler & Hiebert, 1999). They also claimed that this style started in Japan, has now been trending as a method to improve mathematics lesson. Makinae (2010) added that in this method, teachers collaborate to study teaching contents and instructions by observing lessons and discussing about them. Through such an approach, they try to improve the quality of their teaching. In this idea, lesson study can be considered as planning a lesson, observing the lesson together, and then discussing it.

In Japan, Lesson study was well established as a strategy of in-service teacher training by the middle of the 1960s (Fernandez & Yoshida, 2004). On the other hand, in the Philippine setting Ulep (2013) stated that it is an emerging model of continuing professional development for teachers that is school-based and teacher-led. In addition, it can be considered as a professional learning process in which teacher’s works collaboratively to: (1)Formulate goals for student learning and long-term development;(2)Develop “research” lessons to accomplish those goals;(3) Implement the lessons/document observations on lesson implementation;(4) Discuss the pieces of evidence gathered during the lesson implementation and use them to improve the lesson; and (5)Teach and study the lesson again to further refine it.(Ulep, NCSME-UP NISMED, 2013)

To guide the researchers and the research critics in observing and evaluating the research lesson, the authors adapted the notion of *Productive Pedagogies* which was developed by Lingard et.al. (2001). It is a theoretical framework that teachers can use to reflect critically upon their current classroom practice; that is, a vehicle to use as a professional vocabulary around which to have conversations about teaching practice with colleagues and to focus on individual student needs. This scaffold in enhancing teaching and learning outcomes comprises four main dimensions – intellectual quality, connectedness, supportive classroom environment and recognition of differences. Intellectual quality is integral dimension in teaching and learning process. Previous studies indicate that high intellectual quality classroom helps student to perform well academically (Boaler, 1997; Hayes, et.al., 2006; Oakes, Gamoran & Page, 1992). Connectedness

attempts to make school studies to be more 'relevant' which will then provide the students with more meaningful experiences. The supportive classroom dimension supports intellectual quality and connectedness to guarantee the achievement of the learning objectives. There were twenty strategies or pedagogies to support these four main dimensions of productive pedagogy and these strategies were used by the authors as the measures of instruction incorporated in the evaluation instrument made and intended for this lesson study.

In introducing probability by FCP, the research group wanted to come up with a problem-solving approach using the method of lesson study and to support the research group made use of Productive Pedagogies in helping them in observing lessons, and analysing it.

### 3 METHODOLOGY

The research group, who were the authors of the paper, are graduate students taking Master of Science in Teaching major in Math in De La Salle University, Philippines. One of the requirement courses is the *Teaching of Mathematics*, which was taken by the students during the academic year 2013-2014. The said course allotted 42 hrs for lectures, discussion article reading and analysis, and the main project which is the Lesson Study. The masteral students are encouraged to develop inquiry stance which actualized and formalized in the form of a Lesson Study and a research paper, which are major requirements in the said course. There are 29 students attending in the said course, the students were divided into 3, with the last group having 9 members and each would be conducting a LS. The researchers were the last of the three groups to present a research lesson on a chosen topic on mathematics guided by their professor. The fundamental principles of LS described in class and used as a framework for this study are summarized in the doctoral dissertation of the course professor (Elipane, 2012).

With the knowledge of the basic principles of LS at hand, the authors of this paper, who were also the proponents of this study, were able to involve themselves in a series of activities essentially designed for the teacher-researchers to work collaboratively in order to develop an effective lesson intended for the level-8 student-participants, i.e. planning a research lesson, selecting a research topic, implementing it afterwards (data gathering) and analysing the gathered data through post-lesson discussion/reflection.

#### Planning the research lesson

##### *Selecting the Lesson Topic*

Most of the members of the research group were able to teach various topics on probability from the basic and introductory topic to more complex topics, making them decide to have probability as the major field of mathematics to work on. Majority of them experienced some difficulties in teaching the topic on permutation to the more complex topics on probability, one of which is the challenge on how to improve students' learning such as to make the students understand the concepts behind each topic and how to make sense of these learning. The group generally credited these difficulties on the students' misconceptions and vague understanding of the basic and introductory concepts – including of which the fundamental is counting principles.

In the K-12 Mathematics Curriculum Guide that was just released in December 2013, FCP was introduced under Grade 8 Fourth Quarter. (See the illustration below.)

Table 1. This shows a portion of K-12 Mathematics Curriculum

Grade 8 Fourth Quarter – Statistics			
Content	Content Standards	Performance Standards	Learning Competencies
Statistics and Probability	The learner... Demonstrates understanding of key concepts of probability	The learner... Is able to formulate and solve practical problems involving probability of simple events.	Counts the number of occurrences of an outcome in an experiment (a) table, (b) tree diagram; (c) systematic listing; (d) fundamental counting principle.

##### *Selecting the Students*

The research lesson was administered with the participation of the invited students. The research group was able to invite a total of nineteen (19) students from two (2) separate schools. The research lesson was conducted by the month of April, during this time the students were already having their summer break, so the research group had to make special arrangements by inviting willing student participants for study. The group decided to invite students to ensure real outputs from them and better



understand how real students will respond to each element of the lesson. It will also help the research group to identify the kinds of difficulties that actual students may experience and what kind of experiences will support their learning. Eleven students came from Manuel Luis Quezon High School, a public secondary school in City of Manila. The invited students from this school belong to Special Science Program Class, a special program for students who passed the qualifying exam and obtained the general average of 85 and above with no grades lower than 80 in any subject. The said students from this school were 3<sup>rd</sup> year high school which is equivalent to Grade 9<sup>1</sup> for the School Year 2013-2014. Their age ranges from 14 to 15. While the other eight (8) students came from Makati Science High School, a special public secondary school in the City of Makati which offers special science and technology curriculum. The invited students from this school belong to a heterogeneous section. They were Grade 8 students for the School Year 2013-2014 whose age ranges from 13 to 14.

In the present Philippine education system, the school year runs for 10 months. The school year begins between the first and third weeks of June and lasts until the last week of March. This is both for public and private schools. The research lesson was conducted by the month of April, due to this circumstance the research group chose the students from two different year levels but assures that the two sets of students have the same prior knowledge about FCP. The third year high school students from Manuel Luis Quezon High School are still under the former curriculum where in the Fundamental Principles of Counting was not part of their Math curriculum, and Geometry was the focused in this level. On the other hand, Grade 8 students from Makati Science High School are following the new curriculum where in FCP was introduced in the fourth quarter of their previous school year. However, the student's teacher was not able to touch the topic about FCP due to time constraints.

#### Data sources and instruments

Aside from the field/observation notes, video recordings, and records of the discussions during the post-lesson reflections, an evaluation instrument was created for the observers. The observer's evaluation was adopted from the principles of Productive Pedagogy. The Observers' evaluation was designed as a checklist with numerical rating of 1 to 5 with respective descriptive scales as follows: 1- Poorly Manifested; 2 – Fairly Manifested; 3 – Satisfactorily Manifested; 4 – Clearly Manifested and 5 – Notably Manifested. The observers' responses in every

strand of productive pedagogy was summarized by determining the weighted mean and rounding it off to the nearest tenths and be given appropriate descriptive scale.

#### Lesson Planning

As most of the members of the research group already had the experience of a formal teaching on the lesson topic, the group had profound discussions and brainstorming sessions on possible lessons to implement, deciding on utilizing an inductive approach to teaching. In this sense, with the aid of probes coming from the research team, as well as inquiries to be done prior to the lesson, the objective was for the students to have a meaningful learning of the topic, FCP, through problem-solving approach. Examining previously employed lesson plans related to the topic and checking out other researches done, the group was able to write the lesson plan and design different activities appropriate for the students.

Moreover, considering the areas under productive pedagogy, the group had a dry-run performed by the consigned teacher, to anticipate and unlock some possible difficulties that the teacher, or even the lesson itself, may encounter. The mock lesson involved the members of the group to serve as students, yet later to serve as critics for their own groundwork.

#### **Implementation of the research lesson**

The research lesson was conducted with exactly 19 Grade Eight students coming from two different schools. It was observed by the masters' students who were not members of the research team and they were given different areas on productive pedagogies to be observed. The research lesson ran for 80 minutes from 1:30 to 2:50 in the afternoon; however it should originally run in a regular class hour of 60 minutes only. It was recorded through video and observation form.

The teacher started the lesson with the motivational activity entitled “#OOTD: MIX AND MATCH”. The teacher used trending symbol and words nowadays in the title of the activity so that they could get the idea and be motivated as well. The “#” in the title is a hash tag while OOTD means “Outfit of The Day”. The (“#”) a hash symbol popularly known as “hash tag” is a form of [metadata tag](#). Words in messages on [microblogging](#) and [social networking services](#) may be tagged by putting “#” before them. OOTD is also used in fashion blogs. The teacher narrated a situation that every student in

the class could relate to. The students were asked to know the number of ways a boy and a girl can be dressed up with their available clothes. The students were asked first to think on how to solve the problem. Then, the teacher asked the students to solve the problem by modelling it. The students actually wore the wardrobes and took a “selfie” using webcam. This is for the students to see the number of ways they had worn the attires available. The students really enjoyed the activity. They got to experience and solve the problem by themselves. However, before the activity ended, the students recited the idea of using a tree diagram instead to show the number of ways that the attires could be worn. The teacher then conveyed that the number of possible outcomes can truly be shown using a tree diagram. The teacher explained what a tree diagram is and how it is constructed, however he did not give a specific example of using it in order for the students to use their creativity in constructing different forms of tree diagram.

Afterwhich, the teacher proceeded to Activity 2, which is entitled as “OPERATION: COUNT”. In here, the class was divided into four groups. Each group was given a ‘mission envelope’, which contained the problem to be solved and the materials to be used. They were given five minutes to work on the activity. During the activity, the members of the group actively participated and joyfully discussed their ideas with each other. One group found difficulty in solving the problem assigned to them. This is for the reason that the problem they got requires diagramming of 3 events simultaneously unlike of the other groups that requires diagramming of 2 events only. They took time in answering it that’s why they were the last group who presented.

After the allotted five-minute time, the groups were asked to present and explain their answer in front of the class. One group already gave an idea on how to solve the problem easily without the use of tree diagram. After all groups’ presentations, the teacher checked their answer in general. However, the teacher was not able to correct the answer of the last group because the teacher wanted to focus on the easier way of solving which is by multiplication.

To lead the students in discovering the concept of the lesson, the teacher gave guide questions. The teacher elicited students’ answer and lead them to a deeper understanding on what they have done in the previous activities. Subsequently, the students were asked to communicate their ideas on how to tell the number of ways that events can occur simultaneously. Though hesitant to answer, with the teacher’s art of questioning, the students were able

to express their thoughts on the concept. The teacher then revealed the definition of the lesson, Fundamental Counting Principle.

In application of the lesson, the teacher proceeded to the activity entitled “Picture-Picture”, a trending variety show currently in the television. The students were divided according to their original group. The teacher let the students randomly pick a number in order to know whose group is the first and the next one to play. The teacher presented a picture contains objects that needs to be combined. The group was given an illustration board and whiteboard marker. The group was asked to identify the correct number of possible combinations. They were given a chance to discuss their answer, and as soon as they were done, they may write their answers on the illustration board. This activity was done easily by the students. The teacher recorded the time mentally. These procedures went with the other groups as well. When all groups are done, the teacher announced the winner group, the group who has the least time to answer the problem.

Thereafter, the teacher ended the lesson with the activity, “Value in Counting”, in which the students were given set of questions. They were asked to reflect on what did they realize while doing the activities and how will they relate it in real life. Since the students were reluctant to communicate their thoughts, the teacher just asked the students to give one word that they learned in the lesson.

To assess if the students learn, the students were asked to answer the set of multiple choice type of questions orally. Finally, the teacher gave the students an assignment in preparation for the next lesson.

#### **Post- lesson discussion and reflection**

Four categories were harnessed as related to the focus of the study: How to improve and develop teaching of Fundamental Counting Principle (FCP)? The four categories was based upon the four Major Dimensions of Productive Pedagogies which are; (1) Intellectual Quality, (2) Connectedness, (3) Supportive Classroom Environment, and (4) Recognition of Difference.

The observers in the lesson study are grouped accordingly to the categories above to check how effective the activities in students’ learning the concept of FCP.

#### Teacher’s Reflection

Before the observers give their commentaries, the teacher shared his experiences and reflected on

how the lesson went through. Aljay, the teacher informed the observers that the researchers had a dry-run a week before the final presentation to check if the flow of the first activity using realia will be effective for students to easily grasp the concept of FCP. The first activity which he called “Selfie, Selfie” was carry on during the presentation but there are certain problems that occurred during the preparation of the materials so the teacher prepared for a plan B which is to make paper dolls. “We think that the first activity will take too much time, but I believe that we should not be rushing things ahead of time.” commented Aljay. He elaborated that he wanted to make sure that students will get the concept slowly but surely so they pursued the original plan in the lesson plan for the first activity since the problem regarding the materials was solved.

The teacher added that he was so happy that students participated cooperatively in the class even though they came from different schools. He noted that even they are grouped heterogeneously students are able to relate to their group mates through calling their names.

“This is a new set-up of instruction for me; I was not used to giving a lot of activities instead of lectures, I am actually teaching in the college level.” explained by the teacher. He elaborated further that in the college setting, he usually do the talking but in the lesson proper he tried to deviate from his usual routines by asking questions to students.

Dr. Elipane, one of the observers questioned the teacher regarding his comment about rushing things ahead of time as related to learning the concept of FCP. The teacher explained that it is better that students will have a lot of time to think. Another question was asked by Dr. Elipane, he wanted to know how activities can be improved so that it will not take time. The researchers realized that they should go back to the original plan during the dry run wherein only one student should do the activity. Refused to do so, because the idea of the group that most of the students should participate in the first activity. As observed in the final presentation, there is a student who wanted to participate in that said activity that makes it more confusing for the teacher to continue with the plan. Then Dr. Elipane added that the idea of doing the introductory activity by only one student is better. Another idea proposed by one of the researchers to answer the problem is to lessen the task in the activity. The teacher gave two tasks one for the girls and one for the boys, as suggested by Dr. Elipane and some observers it is

better to have one task for both girls and boys and then reconsider the materials to be used.

Other teachers also gave their comments regarding the research lesson. They also suggested on how to revise the lesson plan and the activities.

#### Intellectual Quality

The observer commented that the probing questions on the first part of the activity were very realistic that the teacher elicited realistic responses, since students are able to relate to the activity. “The teacher started with the problem and motivated the students to think.” added the observer. He elaborated that realia helped a lot when students took a picture of them and used real objects in the activity. These aided in the transformation of knowledge. Teachers mentioned that the activities are transformative in a way that students inductively generalized the concept of FCP in their own knowledge. Another observer added, “The teacher was able to bring the students into the real world by just asking, “Do you also have difficulties in choosing what to wear in this day?””. The teacher wants to emphasize that the real scenario has let the students to be involved in the activity.

Some observers noted that the first activity was long enough as an introduction though the connection of the lesson was smooth. Another one suggested that in some question that the teacher asked including the group work activity, the students should utilized the use of board to further enhance their learning. Additional to that Dr. Elipane remarked that the activities lack deep knowledge. He explained that it would be better to revise some of the problems and change it to challenging ones. After giving simple examples, the teacher should integrate challenging questions and examples to develop students’ higher order thinking skills.

#### Connectedness

This dimension focuses on how the activities could be integrated in the real life setting. One observer commented that this particular topic has a lot of real life application. However, Dr. Elipane observed that the millieu are limited on clothing and food. He suggested adding other genres to the examples. Another observer commented that students are really engaged in the activities whenever it is related to real life situations.

Additional commentary was on the integration of the background knowledge – which is the Addition principle, to the concept of FCP. The observer suggested that the two principles should be connected into the discussion of the activities.

One observer remarked was that the values integration part in the latter part of the lesson proper has been a sermon to students. For the observer, he thought that it is better that the values integration should not be given a part in the lesson proper but should come out smoothly during the discussion. Another observer suggested to have journals/ exit card. This comment was given to address the problem since the lesson proper consumes a lot of time; this was the effect when the teacher was not able to elicit responses right away.

Supportive Classroom Environment

Under this dimension, the observers commended the following: (1) the activities, slide presentation are well organized and creative; (2) the lesson was delivered well; (3) the teacher gives encouraging statements and (4) the tasks are clearly presented. On the other hand, observers noted the following: (1) the teacher was not able to use the rubrics in commending the students creative effort on presenting and solving the problems in the activity; (2) the pictures on the activities is not well modified, students will be having a hard time to identify the bracelets from the rings; (3) the tree-diagram was left out in the objective; and (4) the questions should be given one at a time.

Recognition of Difference

Some of the sub-dimensions under this category were not necessary as commented by one of the observers. The observers focused particularly on the following elements; (1) group identity, (2) being inclusive; and (3) active citizenship. The following are noted in the given observers’ evaluation:

- The students were open to study the lesson and participate amidst of their cultures, school and identities.
- The students were able to work and study as a group despite of their schools of origin.
- The students were able to create friendly environment during the activities.
- The teacher was able to create an activity which was very well connected to culture of the new generation such as Selfie and trendy.
- Group works that highly encouraged individual participation regardless of group.

The observer expound further that it is good to use trendy activities so that students can relate to the activity. This linked the generation gap between the teacher and the student. Additional suggestions on the clothing/ accessories use in the introductory activity was given, the observer mentioned that it is

awkward to wear the combination of scarf and headbands as well the combination of caps and necktie, it is much better to use unisex accessories for the activity since its already suggested to lessen the task.

Observers remarked that the students are participative even they came from different schools, which creates friendly atmosphere during activities. At the same time, there was no dominance in the class.

**3 RESULTS AND DISCUSSION**

The accomplishment of the Observer’s Checklist was conducted during the course of the execution of the research lesson itself. There were four types of teacher observation checklists for lesson study based on productive pedagogy, that have been distributed to a specified number of observers stated as follows: intellectual quality- with five (5) observers; connectedness- with five (5) observers; supportive classroom environment- with five (5) observers and recognition of difference – with three (3) observers. The data were collected, classified, analysed and interpreted and thus, presented through tables hereafter. Each category of the productive pedagogy is interpreted using the legend below. The range is computed based on equal interval with the difference of 0.8 for each rating.

Legend: 4.21 – 5.00	Notably Manifested
3.41 – 4.20	Clearly Manifested
2.61 – 3.40	Satisfactorily Manifested
1.81 – 2.60	Fairly Manifested
1.00 – 1.80	Poorly Manifested

Table 1.1 Summary of Teachers Rating Based on Productive Pedagogy (Intellectual Quality)

A. Intellectual Quality	Observers' Numerical Rating					Weighted Mean (WX)	Interpretation
1.Higher-Order Thinking	4	5	4	5	4	4.40	Notably Manifested
2. Deep Knowledge	5	5	4	5	4	4.60	Notably Manifested
3. Deep Understanding	5	5	4	5	4	4.60	Notably Manifested
4. Substantive Conversation	5	5	3	5	5	4.60	Notably Manifested
5. Knowledge as Problematic	4	5	4	5	4	4.40	Notably Manifested
6. Meta Language	5	5	4	5	5	4.80	Notably Manifested
Total	28	30	23	30	26	137	Notably Manifested
	Average (WX)					4.57	

The overall rate of the teachers on the set of categories under intellectual quality has average weighted mean of 4.57 with a standard deviation of 0.15. This indicates that the teachers have closely similar rates on the categories given under intellectual rate because of the homogenous result. Based on the average weighted mean which is 4.57, the teacher exhibits notably manifested intellectual quality under productive pedagogy (Table 1.1).

Table 1.2 Summary of Teachers Rating Based on Productive Pedagogy (Connectedness)

B. Connectedness	Observers' Numerical Rating					Weighted Mean(WX)	Interpretation
1.Knowledge Integration	5	5	5	5	4	4.80	Notably Manifested
2. Background Knowledge	5	5	5	5	4	4.80	Notably Manifested
3. Connectedness to the World	5	5	5	5	5	5.00	Notably Manifested
4. Problem-based Curriculum	5	5	5	5	5	5.00	Notably Manifested
Total	20	20	20	20	18	98	Notably Manifested
	Average (WX)					4.90	

The overall rate of the teachers on the set of categories under connectedness has average weighted mean of 4.90 with a standard deviation of 0.12. This indicates that the teachers have closely similar rates on the categories given under connectedness because of the homogenous result. Table 1.2 also shows that the teacher exhibits notably manifested connectedness under productive pedagogy based on the computed average weighted mean which is 4.90.

Table 1.3 Summary of Teachers Rating Based on Productive Pedagogy (Supportive Classroom Environment)

C. Supportive Classroom Environment	Observers' Numerical Rating					Weighted Mean (WX)	Interpretation
1. Student Direction	4	5	5	4	4	4.40	Notably Manifested
2. Social Support	3	5	5	4	4	4.20	Clearly Manifested
3. Academic Engagement	4	5	5	4	4	4.40	Notably Manifested
4. Explicit Quality Performance Criteria	5	4	4	4	4	4.20	Clearly Manifested
5. Self- Regulation	4	5	5	5	3	4.40	Notably Manifested
Total	20	24	24	21	19	108	Notably Manifested
	Average (WX)					4.32	Manifested

Table 1.3 shows that the weighted averages mean of 4.32, which also indicates that the teacher exhibits notably manifested supportive classroom environment under productive pedagogy. The overall rate of the teachers on the set of categories under supportive classroom environment has a standard deviation of 0.11. This is an indicative that the teachers who were also the observers have closely similar rates on the categories given under the said category because of the homogenous result.

Table 1.4 Summary of Teachers Rating Based on Productive Pedagogy (Recognition of Difference)

D. Recognition of Difference	Observers' Numerical Rating			Weighted Mean (WX)	Interpretation
1. Cultural Knowledge	4	4	5	4.33	Notably Manifested
2. Inclusivity	5	5	5	5.00	Notably Manifested
3. Narrative	5	4	5	4.67	Notably Manifested
4. Group Identity	4	5	5	4.67	Notably Manifested
5. Active Citizenship	5	5	5	5.00	Notably Manifested
Total	23	23	25	71	Notably Manifested
	Average (WX)			4.73	

The teacher exhibits notably manifested recognition of difference under productive pedagogy based on the computed average weighted mean which is 4.73 (Table 1.4). The overall rate of the teachers on the set of categories under recognition of difference has a standard deviation of 0.28. Likewise, this indicates that the teachers have closely similar rates on the categories given under recognition of difference because of the homogenous result.

#### 4 CONCLUDING REMARKS

During the planning stage of the lesson study, the lesson chosen was the Fundamental Counting Principles (FCP) and various activities were created for the instruction. The planning was successfully done for the objectives were met. Although there are some modifications with activities, teaching went smoothly and activities were carried out appropriately. According to students' evaluation (through the use of forms), teaching was effective for they were able to understand the concept of FCP.

The activities were effective in catching students' attention especially Activity 1. The activities were based on real life situations that the students can relate very well. The introduction of the lesson was much easier for the teacher for the lesson was highly connected with the students and creative presentations and interactive manipulative helped a lot. Perhaps it can be concluded that interactive materials can be effectively used as mediator between the mathematical world and real world. It represent abstract concept in the form of more accessible and identifiable knowledge.

The abstraction in Mathematics can be lessened and the concepts transform into a concrete body of knowledge.

Guided by the principles of the Constructivism Theory, it was evident that the students were able to create their own knowledge based on their experiences with the help of interactive learning activities provided by the teacher.

The activities were student-centered that is why it can be observed that the students cooperated very well. The students were highly engaged in the learning process and team work was noticeable. The activities and materials used were very effective in facilitating learning. Since students are so called the “digital natives”, the use of technology in the lesson is very beneficial for the students as well as for the teacher for it captures students’ attention and imagination. It promoted interaction and stimulated discussions among the students that made the learning easy and enjoyable. Teaching with technology transforms the teaching learning process. It allows the students to demonstrate idea through dynamic interactions. The use of ICT in teaching has provided a new face in the process of teaching and learning situation. Lessons are more memorable because students are more engaged and motivated because they can relate with the material that the teacher provided.

Interactive learning actively engages the students. It strengthens the learning situation for both students and teacher. Lectures are transformed into discussions, and students and teachers become allies in the journey of knowledge acquisition. It paves its way for experiential learning. Students are the ones responsible for the creation of knowledge and construct meaning from it. The ultimate goal of this activity is to put the learner in charge of his own learning. Also, through interactive learning activities the teacher can create different learning environments that will arouse the curiosity of the students. The role of teacher changes from main source of knowledge to facilitator. The students are the producers of knowledge rather than consumers. With this, teaching FCP through interactive learning activities would be effective.

Lesson study is very beneficial, for the teacher can see in different perspectives what really transpires in the classroom. Through observations of other teachers, it can be determined if the objectives were met, if the students were engaged during instruction or if there’s a need for revision. Teachers

can discuss among themselves promoting collaborative learning towards the improvement of the lesson. Teachers can learn from each other and they can work together for more productive pedagogical knowledge. It encourages the teachers to think critically and analyse each detail in a learning situation, from lesson planning up to assessment. Also, it creates opportunities for teachers to improve their teaching through feedback and will latter contributes to their professional growth.

During lesson study, teachers were able to collect data in students’ perspective and in a collaborative way through group discussion during post lesson discussion.

Thus, lesson study provides an environment for the creation of refined lesson that would lead to a comprehensive and systematic way of lesson planning with connections among learning goals, execution and reflection.

Based on the evaluation, it can be seen that each activity was assessed for the improvement of the lesson as well as the methods of instruction. Table 2.1 shows the strengths and weaknesses of the conducted lesson study. Also, the teacher will have the chance to improve his strategies, techniques and activities used to be more coherent and aligned with the objectives of the lesson.

The effectiveness of the Lesson study guided by productive pedagogy was beneficial for the improvement of the lesson. The teachers were able to assess the teaching – learning situation using the four dimensions of productive pedagogy. It provided opportunity for the teacher to re-examine his own instruction and how the students responded with the activities presented. Through the post lesson discussion, the following recommendations were given:

- Give more challenging questions that will test the higher order thinking skills of the students;
- Be creative in giving real- life examples such as lottery, route problems, and codes;
- Discuss other methods of counting techniques; and
- Observe the time allotted to the lesson by limiting the learning tasks and implementing time on each task.

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## 7 APPENDIX– Lesson Plan

### FUNDAMENTAL COUNTING PRINCIPLES

April 5, 2014

Grade 8

#### I. TOPIC: INTRODUCTION TO PROBABILITY

Subtopic: Basic Concepts of Probability – Fundamental Counting Principle

Prerequisite Concepts: Multiplication of Whole Numbers

#### II. OBJECTIVES:

At the end of the lesson, the students are expected to:

- A. **Cognitive:** to apply the principle of counting in various areas of problem solving
- B. **Affective:** to define the Fundamental Principle of Counting
- C. **Psychomotor:** to discover the Fundamental Principle of Counting through the examples

#### III. PROCEDURE:

- A. Daily Routine
- B. Lesson Proper

#### ACTIVITY 1: “#OOTD: MIX AND MATCH”

#OOTD stands for Outfit of the Day is trending activity which involves taking self-picture of the students.

Provision for Integration (Class Activity)

Across the Subject Area: Visual and Logical Intelligence, Cultured-based

Procedure:

1. The teacher will narrate a challenging situation.
2. The students will be asked to think of the ways on how to solve the problem.
3. The teacher will ask the students to give their answers.

A boy and a girl will be going to a school party. They just have a limited number of clothing. They want to know the number of ways they can be dressed up with the clothes available.

#### ACTIVITY 2: “OPERATION: COUNT”

Provision for Integration: Cooperative Learning, Interpersonal & Spatial Intelligence,

Procedure:

1. The class will be divided into 5 groups.

2. Each group will be given a problem to solve.
3. They will show their answer by making/drawing a diagram.
4. The teacher will pick one member of the group to present their answer to the problem.

How many different set of accessories can Carla wear if she has 2 necklace, 2 bracelets, and 2 earrings?

A fast food offers 2kinds of donuts and 5 flavors of ice cream. How many combinations of donut and ice cream can you order?

A store sells 3 pairs of shoes and 3 different bags. In how many different matches of shoes and bag can you order?

A school canteen offers a budget meal which consists of rice and viand. How many different meals can the students order if there are 3 choices for viand (maling, egg, & hotdog)?

Maria bought 2 kinds of yellow fruit, 2 kinds of red fruit, and 1 kind of green fruit. How many groups of different colors of fruits can be put in a basket?

\*Guide Question:

1. In what ways can you determine the answer?
2. What makes you sure of your answer?

#### IV. ANALYSIS:

\* The students will answer the following question:

- How can we count for ways of combination, given more elements to combine?
- What is a fundamental principle of counting?

#### V. GENERALIZATION:

#### ACTIVITY 3: “CONSTRUCT YOUR OWN”

Direction:

1. The students will be asked to construct a rule or principle on how to tell the number of ways that events can occur simultaneously.
2. Then, the teacher will give the Fundamental Counting Principle.

**ACTIVITY 4: “VALUE IN COUNTING”**

Provision for Integration: Values

- **What did you realize while you are doing the activities?**
- **What are those activities all about?**
- **How do you relate it in real life?**
- **What did you learn from the experience?**

Procedure:

1. The students will be asked of the questions below.
2. The teacher will then process the responses of the students.

**VI. APPLICATION:**

Provision for Integration: Visual & Logical Intelligence

**ACTIVITY 5: “PICTURE PICTURE”**

Procedure:

1. The class will be divided into 5 groups.
2. The groups will gather around the hot seat and play one at a time.
3. The picture contains objects that need to be combined.
4. The group must identify the correct number of possible combinations.
5. The group members may discuss their answer, and when done, may write their answer on the illustration board.
6. The group who will have the least time to answer the problem will be the winner.



**VII. ASSESSMENT:**

Read the questions carefully. Write the letter of the correct answer.

1. Ana has 2 blouses, 2 pants, and 2 pair of shoes. In how many ways can she dress up?  
A. 6    B. 8    C. 10    D. 12
2. There are 6 flavors of ice cream and 3 different cones. In how many different single-scoop ice creams could you order?  
A. 9    B. 12    C. 18    D. 20
3. You are buying a new car. There are 2 body styles, 5 colors available and 3 models. How many choices do you have?  
A. 30    B. 10    C. 20    D. 40
4. You went to a restaurant for breakfast. The menu includes pancakes, waffles, or home fries. For drinks, there are coffee, juice, hot chocolate and tea. How many different choices of food and drink can you order?  
A. 8    B. 9    C. 16    D. 12
5. A deli has a lunch special which consists of a sandwich, soup, dessert, and drink. They offer the following choices: How many lunch specials are there?

<b>Sandwich</b>	➔	<b>chicken, ham, tuna</b>
<b>Soup</b>	➔	<b>mushroom, corn</b>
<b>Dessert</b>	➔	<b>salad, pie</b>
<b>Drinks</b>	➔	<b>tea, coke, sprite</b>

**VIII. ASSIGNMENT:**

- Research on the definition of the following terminologies:
  - Event
  - Experiment
  - Outcome
  - Probability
  - Combination
  - Permutation

## IMPROVING STUDENTS’ CREATIVE THINKING THROUGH PROBLEM POSSING IN LEARNING LINEAR ALGEBRA

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**Abstract:** The government have set creative element as one of the objective in National Education. The students who has creativity could create brilliant ideas in problem solving. The objective of the research was to improve the students’ creative thinking through Problem Possing in learning linear algebra by using lesson study. Creative thinking is ability to know the kinds of possibility the problem solving. In this case, problem possing seen as a test in thinking creatively, scoring task of problem submission based on the flexibily of the fluency and originality. The indicators of problem possing with creativity namely (1) fluency is achieved when students create a lot of issues that can be solve and share the issues raised (2) flexibily is achieved when students propose issues which has a different way to be solved. (3) Novelty is achieved when the students examine some of the issues raised then express a different issue. The result of the research find out that the ability of students in thinking creatively improved by using problem possing in learning. The indication based on the questions that proposed by the students increasingly varied and problem solving is also done in various ways.

**Keywords:** Creative Thinking, Problem Possing, Linear Algebra, Lesson Study

### 1. INTRODUCTION

The government has set creative element as one of the objectives in National Education as mentioned in Ministry Act number 22, 2006 that is to develop the potential of the learner to be a faithful and pious, well behaved, healthy, scholarly, skilfull, creative, autonomous man, and to become a democratic and responsible citizen.

This is in line with Maslow’s statement (1967) and Giflid (1967) (in Munandar, 2000) that: there are four reasons why creativity is important to be developed namely: (1) by being creative, people can actualize themselves, and self-actualization is primary need in the highest level of human life, and creativity is a manifestation of a fully beneficial individual, (2) creativity or creative thinking as an ability to see various possibilities of solution toward various problems, and as a form of thought which get less attention until today in education especially in school learning that still focuses on knowledge acceptance, memory, and reasoning, (3) getting busy creatively is not beneficial for own self but also give satisfaction to individual; (4) it is creativity that make possible to human improving life level.

Problem possing approach in learning can exercise students to propose questions or problems related to the material learned. In mathematics learning process, problem possing can be viewed as an approach or an objective (Upu, 2003). As an

approach, problem possing relates to the lecturer’s ability to motivate students through challenging formulation of situation so the students can propose mathematics problems that can be solved and result on their ability to solve problem. As an objective, problem possing relates to the complexity and quality of mathematics problem proposed by students.

Creative thinking has been defined by many experts, among others, Baron (1981) (in Munandar, 2000) defined creativity in four dimensions namely: (1) Creativity from personal aspect is creative power potential that exist in every individual, (2) Creativity as a process is a form of thought in which individual find new relations, get answer, new method or ways in facing a problem, (3) Creativity as a support is a strong desire to create, (4) Creativity from product aspect is everything that is created by someone as a result of individual uniqueness in the interaction with environment.

Eventhough creativity can be improved through exercise referring to the development of student’s creative thinking, but the fact shows that school and university have not been able to draw creative graduates. Beside that, tasks of mathematics problem solving given to students tend to be presented in the form of close-ended problem or convergent. Close-ended problem gives strict limitation to students. Close-ended problem entails forcefulness element to answer question based on procedure. Moreover close-ended problem tends to

be discriminative that become the consumption of high-ability student only.

Definition of creative thinking related to mathematics was given by Krulik and Rudnick (1999) who said that creative thinking is the thought which is original, reflective, and produce a complex product. Furthermore Krulik and Rudnick explained that creative thinking involves synthesizing ideas, building new ideas and determining their effectiveness, and also involving the ability to make decision and resulting a new product. This definition sees creative thinking more as a unity in which logical and divergent thinking process exist, support each other and inseparable.

Based on the above description, the objective of this research is to know:

- (1) the students' creative thinking ability before and after problem posing based learning is applied in Linear Algebra subject;
- (2) the significant improvement of the students' creative thinking after problem posing based learning is applied in Linear Algebra subject.

## 2. LITERARY REVIEW

### 2.1 Problem Posing

Literally, problem posing means proposing a question or a problem. Silver (1996:294) suggested the limitation of problem posing as follow:

The term problem posing has been used to refer both to the generation of new problems and to the reformulation of given problems.

Suryanto (1998) explained that:

1. Problem posing is the generation of simple problem or reformulation of the given problem with several changes in order to make it simpler so the problem can be solved. This is happen in the solution of difficult problems, with the definition of problem posing as one of the steps in arranging a problem solving plan.
2. Problem posing is the formulation of problems related to the requirements on the problems that will be solved emphasizing on the proposal of the problem by students.
3. Problem posing is problem proposal from the available information done before and or after the solving activity.

While according to Suharta (2000), problem posing is one of the ways to get the advance in the concept reformation or problem solving. Beside that problem posing becomes an initial intellectual effort functions to stimulate the thought, smash the stiff and narrow perception, open the horizon, and educate.

Silver and Cai (in Upu, 2003) divided problem proposal into three parts, namely (1) mathematical problem, (2) non-mathematical problem and (3)

statement. Mathematical problem is the problem containing mathematical complication and has a relation with the given situation. Mathematical problem is divided into two parts, they are mathematical problem that can be solved and mathematical problem that cannot be solved.

Problem posing in this research is problem proposal based on mathematical situation given, then the problem proposed by the students will be solved by several alternative answers that possible.

### 2.2 Creative thinking

Creative thinking in mathematics refers to the definition of creative thinking in general. Bishop (in Pehkonen, 1997) explained that someone needs 2 different thinking model that complementary in mathematics, that are intuitive creative thinking and logic analytical thinking. This view sees creative thinking more as a intuitive thinking than logic one.

This definition shows that creative thinking is not based on logical thought but more as a thought that suddenly appears, unpredictable, or unconventionally. Pehkonen (1997) viewed creative thinking as a combination of logical thinking and divergent thinking based on the intuition but still in the consiousness. When someone applies creative thinking in a practice of problem solving, the divergent thought that is intuitive produces many ideas. This will be beneficial in finding the solution. This definition explains that creative thinking pays attention on logical thinking and intuitive one to produce ideas. Because of that, in creative thinking two parts of the brain are very needed. The balance between logic and intuition is very important. If placing logic deduction too much, creative ideas will be neglected. Thus, to raise a creativity, the freedom of thinking is needed, not under control or pressure. This view directs more on the second view in the definition of creative thinking.

Krulik & Rudnick (1999) explained that creative thinking is the thought which is original, reflective, and produce a complex product. That thinking involves synthesizing ideas, building new ideas and determining their effectiveness. Beside that, it also involves the ability to make a decision and result a new product. This definition mentions that creative thinking in only intuitive that free from logical thinking and does not mention clearly creative thinking as a synthesis or combination of logical thinking and intuitive divergent thinking. This definition sees creative thinking more as a unity in which logical and divergent thinking process exist, support each other, and inseparable.

Creative thinking in this research is mental activity done by someone to find fluent, flexible, and novel idea. Idea meant here is the idea in solving mathematical problem.

### 2.3 Problem Possing dan Creative Thinking in Mathematics

One of the learning approaches that can enhance students' creative thinking in mathematics is problem solving approach. This is in line with Pehkonen's statement (1997) that learning problem can: (1) generally develop cognitive skill, (2) enhance creativity, (3) apply mathematics, and (4) motivate the students to learn mathematics.

Silver (1997) gave indicator to assess the creative thinking ability of student (fluency, flexibility, and novelty) using problem posing and problem solving. The relation is described in the following table.

Table 1 The relation between problem solving and posing and creativity component

Creativity Component	Problem Possing
Fluency	Students make many problems that can be solved. Students share various problems proposed.
Flexibility	Students propose problems that have different ways of solving. Students use "what-if-not?" approach to solve problem.
Novelty	Students check several problems propose, then propose a different problem.

#### Research Hypothesis

There is a significant improvement of students' learning result after problem posing based learning in Linear Algebra subject.

### 3. RESEARCH METHOD

This research was experimental research with One Group Pretest-Posttest design. The experiment unit was 40 students of Mathematics Education Study Program in the third semester of 2013/2014 academic year. The treatment given was problem posing based learning in Linear Algebra subject. This research was done through Lesson Study. The learning was conducted in four meetings. This research began with pretest and ended with posttest. The research instrument used was open-ended problem solving test. The creative thinking ability of the students through problem posing based learning in Linear Algebra khusus was observed in every lesson by giving problem posing tasks. While to measure the rate of students' learning result, the average of normalized gain was used.

### 4. DISCUSSION

The students' creative thinking ability through problem posing based learning in Linear Algebra subject was observed in every lesson by problem posing task and open ended problem solving given. The improvement rate of students' learning result in Linear Algebra was analyzed using the average of normalized gain. The classification of the improvement of the students' learning result in Linear Algebra subject is as follow:

Table 2 Normalized Gain Classification

Gain Normalization Coefficient	Students	Percentage (%)	Classification
$g < 0,3$	2	5	low
$0,3 \leq g < 0,7$	16	40	medium
$0,7 \leq g$	22	55	high
Average gain = 0,75			high

Based on table 1 above, the average normalized gain of students learning result was 0,75 which categorized as high. It shows that there was a significant improvement of students' learning result in Linear Algebra through problem posing based learning.

Creative thinking in mathematics is a series of activity happen in the student's mental/thought that can be observed through visible behaviour in the form of solving technique of mathematics problem given by referring to: (1) fluency (2) flexibility, and (3) novelty. Fluency in problem solving is defined as student's ability to solve problem by various correct ways. Several answers to the problem are said to be various, if the answers look different but follow a certain pattern, or have same idea. Flexibility in problem solving is defined as the ability of students to solve problem with various different and correct ways. Several answers to the problem are said to be various, if the answers look different but follow a certain pattern, or have same idea. Novelty in problem solving is defined as the ability of students in problem solving that is "uncommon" done by the students in their prior level of knowledge or the answer given has never been got before. Has never been got before means: never been taught by the lecturer, never been learned from book, or internet, dan never been discussed with their friends.

Haylock (1997) stated that creative thinking in mathematics refers to divergent thought and the product resulted reflects the creative thinking of someone. Nohda (in Paduppai, 2005) said that problem posing and open-ended problem can help to develop creative activity and mathematics thinking system of the students through problem solving simultaneously. While according to Shawada (in Becker, 1997), open-ended problem determines three criteria: (a) fluency that is how many solution that can be given by the students, (b) flexibility is how many difference of idea posed by the students, and (c) novelty is in the level of whether the originality of those ideas, in the form of uniqueness, sharpness, and authenticity of those ideas.

Problem posing based learning in terms of improving students' creative thinking ability is that students make many problems that can be solved, then they share the problem to other students. After that, students pose a problem that has different ways of solving, then students check several problems posed, then pose a new problem.

## 5. CONCLUSION

The students' creative thinking ability improved through problem posing based learning. This was proved by the problems posed by the students that were more varied and the problem solving are also done in various ways.

The learning result of the students of Mathematics Education Study Program through problem posing based learning in Linear Algebra subject was classified as high.

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## School Based Lesson Study:

### *An Investigation of Practice, Achievement and Challenges in an Indonesian Junior Secondary School Science Teachers*

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**Abstract:**

*In this paper the experience of science teachers on Lesson Study in public school of Indonesia was investigated. Lesson Study, typically defined as teachers' classroom based collaborative research, has a long history in Japan as a shared professional culture with potential for enhancing learning, enriching classroom activities and transforming the school environment. Lesson Study, as an approach to teacher's professional development, has been introduced to Indonesian educators for almost a decade. The purpose of this study is to investigate the practice, achievements and challenges of Lesson Study in Indonesia. The population of the study composed of teachers of laboratorium junior secondary school, Indonesia University of Education (UPI) in Bandung city. Data were collected using questionnaire and focus group discussion. The questionnaire was first developed in English and later translated to "Bahasa Indonesia" to avoid language barrier while responding. In the focus group discussion the principal, vice principal, science department head and school Lesson Study coordinator were involved. The responses collected from both methods were analyzed and interpreted on percentage basis. The findings indicated that Lesson Study is a culture for the school teachers improving knowledge of subject matter and their profession through comments and collaborative work. Also, found that no financial support was provided to the school for lesson study processes except technical assistance of experts from faculty of science and mathematics education of UPI. Negative comments during debriefing and spending more time for preparation and consulting experts are some of the obstruction of this study.*

**Keywords:**

*School based Lesson study, challenges, junior secondary school science teachers, Indonesia, achievement*

## 1. INTRODUCTION

Professional development refers to many types of educational experiences related to an individual's work. Doctors, lawyers, educators, accountants, engineers, and people in a wide variety of professions and businesses participate in professional development to learn and apply new knowledge and skills that will improve their performance on the job (Mizell, 2010). It is the systematic maintenance, improvement and broadening of knowledge and the development of personal qualities necessary for the person to sustain their relevance and effectiveness at work throughout their working life (Kennie, 2000).

Continuing professional development is important because it ensures individuals continue to be competent in their profession. It is an ongoing process and continues throughout a professional's career (Kloosterman, 2014). Teachers' knowledge and practices are the most immediate and most significant outcomes of any professional development activities. They are the primary factor influencing the relationship between professional development and improvements in student learning (Guske and Sparks, 2002). Teacher professional development is about teachers learning, learning how to learn, and transforming their knowledge into practice for the benefit of their students' growth (Avalos, 2011). Professional development, if well implemented, is a potentially promising strategy for improving teaching, and ultimately student learning (Loeb *et al.*, 2009).

Teachers are expected to help students develop rich understandings of important content, think critically, construct and solve problems, synthesize information, express themselves proficiently, and demonstrate these understandings and skills on new types of assessments (Borko *et al.*, 2002). Teacher professional development is essential to individual teachers' growth as well as organizational change in schools, both of which are necessary for true educational reform to occur (Sykes, 1996).

In education, the most commonly used forms of professional development as mentioned by (Meyer and Wilkerson) 2011 include short sessions at meetings, one-to-two day school-based workshops on specific topics, or two-to-three-week grant-supported workshops in the summer. However, nowadays a recently emerging and disseminating form of professional development is Lesson Study. Lesson Study is a type of classroom research in which a few teachers investigate teaching and learning in the context of an actual single class lesson. When the teachers complete the study they

document their work in a report that describes the lesson they designed, explains how the lesson worked and what they have learnt about teaching and learning from the Lesson Study experience (Ono and Ferreira, 2010). It is a teaching improvement and knowledge building process that has origins in Japanese elementary education (Cerbin and Kopp, 2006). It had been practiced in Japan since the 19<sup>th</sup> century and became popular after 1960s (Ono and Ferreira, 2010). Also, Moss (2008) stated that Lesson Study is a professional development process that involves joint research and lesson planning under a common goal, where teachers engage with one another in designing, implementing, observing, and reflecting on “research lessons.” In lined with this, Arani *et al.* (2010) added that it is teachers' classroom based collaborative research, with potential for enhancing learning, enriching classroom activities and transforming the school environment.

Lesson Study is a professional development activity that is characterised as classroom-situated, context-based, learner-focused, improvement-oriented and teacher-owned (Ono and Ferreira, 2010). Moreover, it is a case analysis model of learning activity aimed to help develop teachers' professionalism and provide them a chance of mutual learning on the basis of real activities in the class. In Japan, as a development model of teachers the Lesson Study can improve teachers' professionalism and educational quality Subadi *et al.* (2013).

Lesson Study, a professional teacher development process, nowadays spread out and developed in many countries, from its origin Japan, which is the home country of Lesson Study development, to USA and other several countries including Indonesia. In Indonesian context, Lesson Study is a process by which teachers and teacher educators work together to critically improve the quality of classroom practice through planning, observation and reflection cycle based on the principles of collegiality and mutual-learning to develop a learning community suggested by Suratno & Cock (2009). Accordingly, teachers work collaboratively to: (a) formulate specific goals for student learning, and form hypotheses about instructional activities that will support these goals; (b) plan, conduct, and observe research lessons; (c) observe student learning, engagement, and behavior during the lesson; and, (d) discuss and revise the research lesson, and the approach to instruction, based on these observations (Moss, 2008).

### 1.1. Processes of Lesson Study

Lesson Study involves a Plan-Do-See cycle, that is, collaborative planning, implementation and observation, and reflection of teaching and learning processes



aimed to help develop teachers’ professionalism and provide them a chance of mutual learning on the basis of real activities in the class Subadi *et al.* (2013). It is a professional development practice in which teachers collaborate to develop a lesson plan, teach and observe the lesson to collect data on student learning, and use their observations to refine their lessons. It is a process that teachers engage in to learn more about effective practices that result in improved learning outcomes for students (Stepanek *et al.*, 2007). Moreover, Hurd and Licciardo-Musso (2005) added that Lesson Study has the potential for empowering teachers by demonstrating to them their own ability to improve their practice and the learning of their students. This building of efficacy for teachers is one of the great appeals of the lesson study process. The Lesson Study phases are as follows:

### 1.1.1. Planning Phase

Planning a research lesson differs from everyday class preparation in several ways. An obvious difference is the degree to which teachers collaborate with one another in creating the lesson (Cerbin and Kopp, 2006). The planning phase begins with problem identification which includes: the selection of the topic, preparing content and teaching materials, strategy used in teaching as well as mapping out lesson plans. As mentioned by Suratno (2010) at this stage the Lesson Study team collaboratively develops teaching and learning design based on students’ needs and their learning demands.

The process of Lesson Study is initiated by setting a goal. The teachers will work collaboratively on ways to achieve the particular goal. The study of teaching materials is believed to help teachers clarify unclear points and to confirm and strengthen the content knowledge necessary to teach the topic effectively (Baba & Kojima, 2004). Mapping out lesson plans requires teachers to have a good understanding of their learners’ needs, pre-knowledge and misconceptions. Teachers are encouraged to anticipate the challenges learners may encounter in the lesson and to be prepared with appropriate strategies to assist them (Ono and Ferreira, 2010).

### 1.1.2. Implementation (Do) Phase

After the planning phase, a teacher conducts the study lesson based on the plan. The lesson plan is usually photocopied and distributed to each observer. The number of colleagues who observe the lesson varies depending on the purpose of the particular Lesson Study. If it is a Lesson Study by a subject group or a grade level of teachers, the number of teacher observers is usually smaller. On the other

hand, when the Lesson Study is carried out in a large public research meeting, dozens of observers including curriculum experts and tertiary teachers will attend. In each case, the participants will carefully watch what the teacher and the learners do (Ono and Ferreira, 2010). The main focus of the observations is student thinking and learning (Doig and Groves, 2011), with observers, like the teacher, Instead of observing how the teacher teaches, as in typical classroom observations, they focus on how students respond to the lesson, which was designed by the team rather than by the person who happens to be teaching (Cerbin and Kopp, 2006).

Sometimes observers choose to focus on just one or two students for the entire lesson. Observers do not interact with nor “help” the students or the teacher during the lesson, as the purpose is to observe the implementation of the lesson as planned (Doig and Groves, 2011). Moreover, the observers listen attentively and make a note on the lesson plan of the critical remarks and on behaviours of the teacher and the learners in relation to achieving the lesson outcomes. The observational notes on a lesson plan serve as evidence for later discussions in a post-lesson conference or forum (Ono and Ferreira, 2010).

### 1.1.3. Reflection/Post Class Discussion (See) Phase

In most cases, the post-lesson forum or reflection follows immediately after the lesson. If time or schedules do not allow for it, the post-lesson forum may take place later on another day (Ono and Ferreira, 2010). The debriefing can be held in a separate meeting room (hall) or in the classroom where research lesson carried out. However, as suggested by Takahashi and Yoshida (2004) holding the debriefing in the classroom in which the research lesson was held might be a good idea because participants can see the blackboard writing and the materials that the students used during the lesson. In addition, teachers should bring all the resources (such as textbooks, teacher’s manuals, and manipulatives) that they used to develop the lesson, as well as data collected from the lesson (such as observation notes, students’ worksheets and notebooks, and notes from pilot lessons). Moreover, the debriefing session usually begins with an instructor’s short comments on his or her teaching. The instructor addresses how the lesson went, what difficult decisions he or she made during the lesson, and what he or she would like to discuss with participants.

All observers are encouraged to contribute to refining and improving the lesson by asking for clarification, recognising the strengths or good aspects and identifying the challenges. Comments on the challenges should

ld be accompanied by suggestions and alternatives (Ono and Ferreira, 2010).

In summary, Lesson Study consists of cycles of instructional improvement in which teachers work together to: formulate goals for student learning and long term development; collaboratively plan a ‘research lesson’ designed to bring to life these goals; conduct the lesson in a classroom, with one team member teaching and others gathering evidence on student learning and development; reflect on and discuss the evidence gathered during the lesson, using it to improve the lesson, the unit, and instruction more generally; and, if desired, teach, observe, and improve the lesson again in one or more additional classrooms (Lewis, 2009). It emphasized collaborative research on classroom activities, and enhanced the possibilities for teachers to reflect upon their own practice from multiple perspectives (Arani et al., 2010).

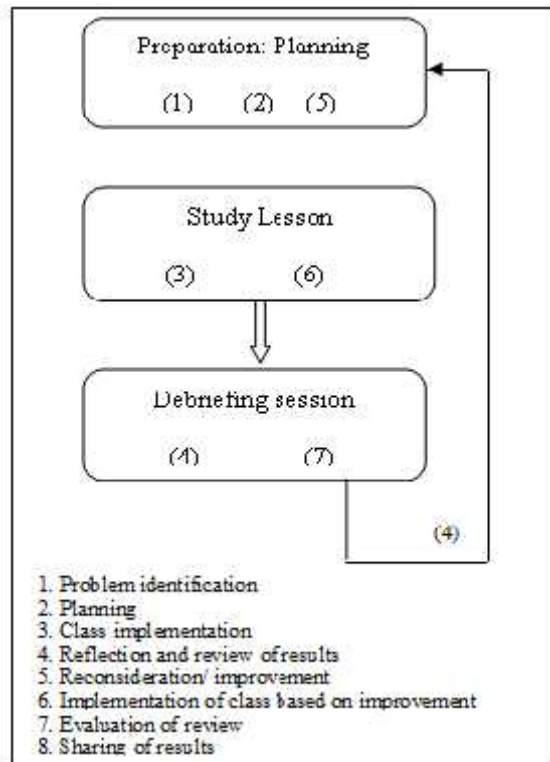


Figure 1. The processes of pedagogical training adopted from Stigler & Hiebert (1999)

The above Figure -1 shows, Lesson Study is a cyclic process which consists of different steps. The first stage consists of steps (1) to (4) and the results of the reflection in step (4) leads us to the second stage, step (5) to (7) which is improvement stage and the cycle continues until the best lesson is produced and finally it will be shared as in step (8).

## 1.2. Merits of Lesson Study

Lesson Study is an excellent form of CPD (continuing professional development), which has the potential to make real improvements to teaching and learning that are sustainable and not just short-term gains. This is, in part, due to the fact that the teachers are dealing with their own classrooms and their own students rather than theoretical situations with virtual students, the model used for much CPD work in the past two or three decades (Burghes and Robinson, 2009). It values us as professionals and allows us to use our collective talents and experiences to increase student achievement through increasing our knowledge as professionals. It is not another new program, but a tool that helps teachers to be effective learners themselves (Hurd and Licciardo-Musso, 2005). In lined with this Heidema and Mitchell (2005) stated lesson study as a model for teacher’s professional development used to improve the learning experience teachers give their students. It is a structured, learning strategy grounded in classroom practice to improve student’s learning and teachers collaborate over a period of time to research, design, implement, test and improve conceptual grounded lessons to promote and enhance students learning of specific concepts and content.

To summarize, Lesson Study serves as an ongoing method to improve instruction through careful observations of students and their work (Lewis, 2002). Moreover, (Lewis, 2004) stated that in successful Lesson Study initiatives in the United States, teachers benefited from increased knowledge of subject matter, increased knowledge of instruction, increased ability to observe students, stronger collegial networks, stronger connection of daily practice to long-term goals, stronger motivation and sense of efficacy, and improved quality of available lesson plans.

## 2. METHODOLOGY

The population of the study included teachers of laboratorium junior secondary school of UPI (Indonesia University of Education) in Bandung city. Data were collected using questionnaire and focus group discussion. The questionnaire consisted of 15 items, and was first developed in English and later translated to “Bahasa Indonesia” to avoid language barrier while responding. The questionnaire deals on perception of teachers on Lesson Study processes and the impact of Lesson Study on teachers. It was also administered by all science teachers of the school. In the focus group discussion data collection method, the principal, vice principal, science department head

and coordinator for Lesson Study program were involved. Moreover, data collection instruments such as camera and audio recorder were used to secure flow of ideas and to minimize loss of participants' response. Both cases were designed to seek information about the practice, achievement, and challenges of science teachers on Lesson Study. The response collected from both these methods were analyzed and interpreted on percentage basis.

### 3. RESULTS AND DISCUSSION

The data were collected through personal visit. Teachers and administrators of the school were very cooperative. The data have been presented in the form of Tables.

Table 1. Demographic information of respondents

Description	f	%
Sex		
Male	2	50
Female	2	50
Age		
18-25	2	50
26-34	1	25
35-43	1	25
44-52	-	-
If any	-	-
Educational background:		
Certificate or diploma	-	-
Bachelor degree	2	50
Master's degree	2	50
If any	-	-
Experience as science teacher:		
0 - 5	2	50
6 - 10	1	25
11 - 15	1	25
16 years and above	-	-

Demographic characteristics' of respondents of the laboratory junior secondary school science teachers of UPI was assessed as follows:

Of the total 4 science teachers of the school 2(50%) were males and the remaining 2(50%) were females. With regard to age composition 2(50%) have 18 - 25 years, 1(25%), 26 - 34 years and the remaining 1(25%) lay in the range of 35 - 43 years. With respect to their qualification 2(50%) of the respondents were with first degree and the rest 2(50%) were with master's degree levels of education. Moreover, 2(50%) of the respondents were 0 - 5 years, 1(25%),

6 -10 years and the rest 1(25%) were 11 - 15 years of experience as science teacher (table 1).

Table 2. Questionnaire related to the practice, achievement and challenges of lesson study and the respondents response.

Description	3	4
1. The Lesson Study contributes to my teachers' professional development.	25%	75%
2. Improving knowledge of subject matter and pedagogy.	25%	75%
3. The Lesson Study has improved my understanding of students' learning.	75%	25%
4. The Lesson Study has improved my perceptions on collaborative work practices to design lessons that engage students with their learning.	25%	75%
5. Experiences and knowledge gained during the Lesson Study is very valuable and important in order to make me a better science teacher.	25%	75%
6. Lesson Study played an important role in improving my teaching skills.	50%	50%
7. Inspiring for improvement of my class.	75%	25%
8. More sensitive to observe student activity.	75%	25%
9. Inviting colleagues to observe lesson.		100%
10. I learnt a better way to teach the topic	50%	50%
11. I have a deeper understanding of how students learn science content in the lessons.	75%	25%
12. My teaching has improved after taking part in lesson study.	50%	50%
13. I learnt that Lesson Study can be implemented and are sustainable in my school.	75%	25%
14. Improving awareness of student's difficulties.	75%	25%
15. Develop own lesson plan.	50%	50%

The questionnaire for this study (Table -2), was adopted and modified from four previous Lesson Study and Learning Study researches such as the research done by White and Southwell (2003) on Lesson Study: A Model of Professional Development for Teachers of Mathematics in year 7 to 12, research done by Lo (2009) entitled the Development of Learning Study Approach in Class Room Research in Hong Kong, a research conducted by Fernandez (2005) entitled Exploring 'Lesson Study' in Teacher Preparation and a research by Suhaili and Khalid (2011) on Mathematics Teachers' Perception of Lesson Study as a Continuous Professional Development Programme. Teachers selected one of the 4- point

scale options (Likert -type scale) (Agreement scale: 1= strongly disagree, 2= disagree, 3=agree, 4=strongly agree). Besides, the results of their choice were assessed below.

As we can see from the data gathering sheet (Table - 2), majority (75%) of the respondents strongly agreed that Lesson Study contributed to their professional development. In lined with this, as mentioned by (Daring Hammond, 1997; Daring Hammond and Ball, 1998; Yoshida, 1999 cited in Lewis *et al.*, 2004) Lesson Study create a condition of Strongly collegial networks and can help teachers build a community of practice in which teachers routinely share resources and ideas as they participate in research lessons. Group of teachers collaborate over a period of time to research design, implement, test and improve conceptually grounded lessons to promote and enhance student learning on specific concepts and content. Hence, discussions giving critical feedback on Lesson Study members’ lessons and student learning help them to develop a conducive environment for individual teachers to gain knowledge about ways to improve their own teaching (Heidema, & Mitchell, 2005).

Majority (75%) of the respondents stated that Lesson Study play a great role in improving their knowledge of subject matter as well as in understanding of students’ learning. During the Lesson Study cycle teachers discuss the essential concepts and skills that their students need to learn, compare the concepts’ treatment in existing curriculum and consider what students currently know and how they will respond to the planned lesson. As they engage in these activities they naturally generate many questions about the subject matter. The group can often answer such questions; if not, teachers look to outside resources (Lewis *et al.*, 2004). Hence, exchange of ideas among group members enable to develop knowledge of the subject matter. They also added that during the research lesson, one member of the Lesson Study group teaches while others collect specific data on what students wrote and said, how students used the material, what specific supports encouraged understanding and what obstacles to learning arose during the lesson. Therefore, what teachers learn during Lesson Study applies to areas beyond the particular lesson which increase understanding and knowledge of instruction. Moreover, Lesson Study creates a safe environment in which colleagues can collaborate. It has the potential for empowering teachers by demonstrating their own ability to improve their practice and the learning of their students.” This building of efficacy

for teachers is one of the great appeals of the Lesson Study process (Hurd, 2005).

Most of the respondents strongly agreed that collaborative work practice strengthens their understanding on designing a lesson that engage students actively participate on learning. According to Department for Children, Schools and Families (2009) Lesson Study group members by considering the learning needs of the class to be taught collaboratively designs an innovative lesson or sequence of lessons that uses the techniques to be focused upon. The planning has detailed and specifies resources, teaching approaches, intended pupil activity, anticipated pupil responses and outcomes. Besides, one teacher assigned to teach the lesson and the rest of the group observes closely the way pupils react, how effectively they learn and make progress and how well the design of the lesson meets pupils’ needs and engages them in learning.

Burghes and Robinson (2009) argued that Lesson Study encourages all teachers in a department or school to collaborate in supporting and learning from each other which help them to develop awareness on what good teaching is. It also encourages creativity, willingness to take risks, try out new ideas and to share these experiences. Eaker *et al.* (2002) mentioned that through a culture of collaboration, teachers in professional learning communities work together to set goals, plan lessons, and use results - focused data to reflect on and improve their teaching practice as part of their commitment to optimal student learning. Moreover, Lesson Study values us as professionals and allows us to use our collective talents and experiences to increase student achievement through increasing our knowledge as professionals (Hurd and Licciardo-Musso, 2005).

Accordingly, majority (75%) of the respondents strongly agreed that the experience and knowledge they gained through Lesson Study made them better science teachers. in addition to this half (50%) of the respondents strongly agreed that Lesson Study played an important role in improving their teaching skills. It is an activity that can encourage the formation of a community of learning (learning society) that consistently and systematically self-improvement, both at the level of individual and managerial (Lasut, 2013). As stated by Lewis (2000) Japanese teachers mentioned many effects of research lessons on their own professional development, including feedback on their own teaching and new ideas gained from watching other teachers. Research lessons help them see their teaching from various points of view. A lesson is like a swiftly flowing river; when you are teaching you must make judgments instantly. When you do a research lesson, your colleagues write down your words and the

students' words. Your real profile as a teacher is revealed to you for the first time. Findings from Japanese study on teacher candidates also suggest that Lesson Study provides opportunities to build professional learning communities, to deepen understanding of curriculum and pedagogy, and to develop habits of critical observation, analysis, and reflection (Melville and Chassels, 2009). Moreover, Lewis (2004) added that Lesson Study helps to develop instructional expertise. It builds understanding of instruction - of how lessons can be honed and modified to better reach children. This expertise seems to be built both during the lesson planning, as teachers anticipate student responses and hone questions they will ask, and also as a result of teaching the lesson, when teachers reflect on the lesson's activities, visual aids, worksheets, key questions, and so forth. Finally, Cerbin and Kopp (2006) conclude that lesson study encompasses the full complexity of teaching and learning in the context of a single class lesson. Essentially, teachers have opportunities to question, explore and reflect on every phase of the teaching and learning process.

According to this study majority (75%), of the respondents also agreed that Lesson Study inspired them to improve their class as well as made them more sensitive to observe their students activity. In lined with this, Japanese teachers believe that time spent studying their lessons will subsequently improve their teaching. Furthermore, they believe that the most effective place to improve their teaching is in the context of a classroom lesson (Stigler & Hiebert, 1999). Besides, Cerbin and Kopp (2006) stated Lesson Study as an evidence-based approach to teaching improvement. In the best cases, teachers get important insights into how their students learn from the lesson, where they get stuck, what changes take place, and how they interpret ideas. We believe that observations of classroom thinking can provide the kind of data that is directly applicable to making improvements in the lesson.

All of the respondents strongly agreed that they invited their colleagues for the lessons they prepared and get comments which help them to improve their teaching which was difficult to invite as well as to be observed by their lesson study members at the beginning of Lesson Study introduction into their school as mentioned in the focus group discussion. In lined with this, research in mathematics on Lesson Study in Brunei school Darussalam, Suhaili and Khalid (2011) mentioned that it was a common practice in Brunei for teachers not to open up their classes to allow other teachers to observe their lessons.

The aim of inviting colleagues is similar to observation in Lesson Study implementation phase which is to observe the progress of the implementation of the lesson. According to Doig and Groves (2011) the main focus of the observations is student thinking and learning with observers making detailed notes of students' solution strategies. Sometimes observers choose to focus on just one or two students for the entire lesson and they do not interact with nor “help” the students or the teacher during the lesson.

Majority (75%) developed a deeper understanding on how students learn science content and they agreed Lesson Study to be implemented and sustainable in their school. During a series of meetings in research lessons, teachers had to think carefully about the object of learning, critical features, questions, activities and approaches to be used. Also, they obtained feedback on their own teaching and new ideas from watching how their colleagues taught the same topic through research lessons which was likely to lead for improvement (Lee, 2008).

Half of the respondents strongly agreed that their way of teaching has improved after taking part in Lesson Study and able to develop their own lesson plan. Developing a lesson plan is one of the key steps in Lesson Study and their frequent meeting and collaboration might play a great role for their improvement. Lewis *et al.* (2004) stated that Lesson Study is rich in possibilities for improving current mathematics and science instruction by citing results from a successful teacher-led lesson study initiative, and showed benefits of Lesson Study including knowledge of instruction and improved quality of available lesson plans. Also, they conclude that lesson study goes far beyond simply improving a lesson—it challenges teachers to improve their classroom instruction. Moreover, White & Southwell (2003) suggested that Lesson Study is a model of professional development designed to assist teachers to produce quality lesson plans and gain better understanding of student-learning

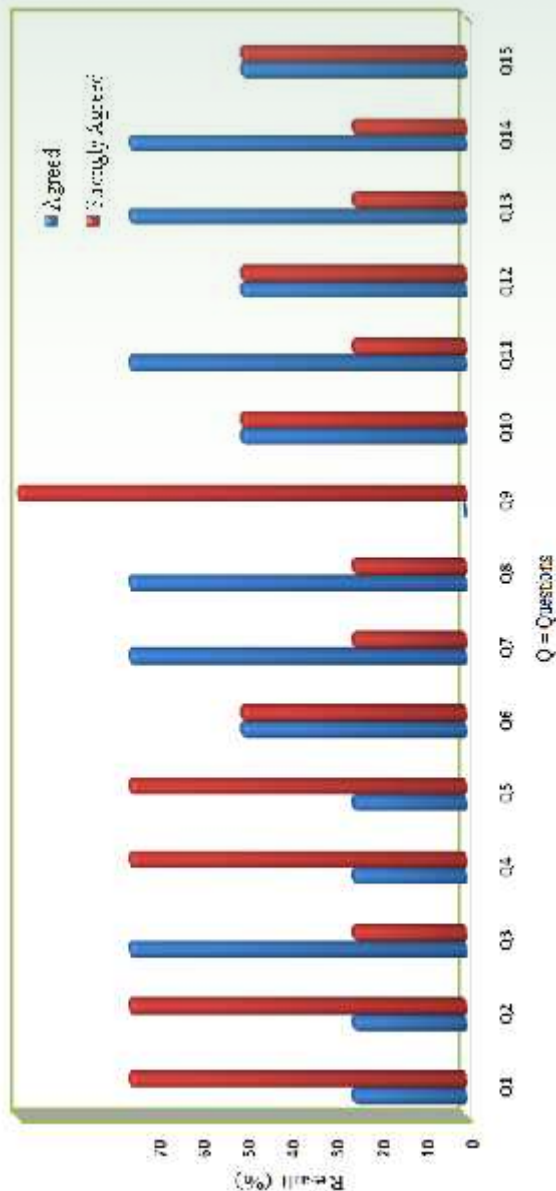


Figure 2. Graphical representation of questionnaire results

The questions from questionnaire survey and the respondents response is presented by the graph on Fig. 2 above. As we have seen from the Table -2 on Page (8) and the above graph (Fig. 2) the respondents' response laid only on agreed and strongly agreed options. This indicated that Lesson Study has a positive relationship with professional development of the school teachers. They collaboratively Plan, Do and See the research lesson. Consequently, they shared knowledge and skills during the Lesson Study processes as it was mentioned by (Lewis, 2009).

Baba (2007) stated Lesson Study, a process in which teachers progressively strive to improve their teaching methods by working with other teachers to examine and critique one another's teaching techniques. Besides, according to the information gathered from focus group discussion (FGD), the school considered the implementation of Lesson Study compulsory for continuous improvement of teacher professional development since 2010. Moreover, the school has regular schedule for Lesson Study implementation and at least one teacher from all subjects became a teacher model each month.

The implementation of Lesson Study in the school was financially supported by Faculty of Mathematics and Science Education (FPMIPA) of Indonesia University of Education. However, starting five years ago the school has no external financial support source. It exists independently by itself along with the school's parent's council. Moreover, the school teachers' even some times spent their own money for implementation of Lesson Study such as preparation of teaching learning material and transportation (if held out of class days).

Though financial support from FPMIPA is halted, it is now supporting the school by providing experts that give guidance or consultation to teachers related to how to choose appropriate method or strategy to teach, how to manage the classroom during Lesson Study implementation and on how to conduct efficient teachers' reflection.

The focus group discussants identified the following as major obstacles that impede the implementation of Lesson Study in their school. These include:

1. All the school teachers did not get the necessary knowledge from experts regarding with pedagogical aspects and the essence of Lesson Study so that it cause some misconceptions and confusion.
2. During reflection (see phase), the observers directly tends to give negative comments without considering the positive (good) aspects. This is considered as big problem especially for teachers who implement Lesson Study for the first time.
3. Require more time for preparation; teachers spend time in finding most appropriate teaching media and doing consultation with experts regarding lesson plan preparation as well as to discuss with their peers on the subject area topics.

4. Teachers seem to be looked well in front of camera unlike that of teaching naturally as in normal situation. Because there are lots of observers, model teachers focus on their appearance for every single moment to be looked great which affect the learning process not to proceed as expected.

Initially the school teachers considered Lesson Study as a means for judging teachers and to compare and create differences among them instead of improving teachers' profession and students learning. Also, they suggested that Lesson Study would be effective as all teachers get the proper training before its implementation regarding the process, importance, on the way to give comments during reflection as well as where the comments to focus which strengthen awareness and understanding of teachers. Moreover, Lee (2008) stated that to make Lesson Study successful and a pleasant experience for school teachers, it has to be made clear to teachers that the aim of classroom observation is not to assess teacher effectiveness in a particular lesson.

Similar to this, a study by Lee (2008) a Hong Kong case on benefits and concerns of Lesson Study teachers mentioned that it is time consuming. They spent a lot of time on numerous pre meetings, meetings and clerical works as well. Besides, they suggested that huge labor power is concerned during the whole process. Moreover, a Singapore case of Lesson Study by Cheng and Yee (2011) indicated that teachers felt similarly constrained by time when implementing the cycles required of lesson study.

Lesson Study has plenty of advantages as mentioned by various scholars. To mention some: increasing knowledge of subject matter, increasing knowledge of instruction and building strong collegial networks (Lewis, 2004; Lee, 2008). One of the discussants in the focus group discussion stated lesson study as follows:

*Lesson Study is main asset since it improves teachers' thinking to be brave and active. Also, lesson study helps students to learn in collaboration which strengthen student-centered method of teaching.*

In Lesson Study teachers collaborate to design and implement a lesson. Hence, their discussion with each other and comments from observers during reflection makes them develop courage besides their knowledge gain and this might help teachers to find solutions when students ask unexpected questions out of the lesson they teach or for which the teacher do

not give focus. A study by Suhaili and Khalid (2011) on mathematics teachers' perception of lesson study, teachers commented that Lesson Study would be useful for teachers as lesson study exposed teachers to student centred rather than teacher centred teaching methods. It allows students to think in their own way and express their ideas to teachers and other students.

Lesson Study is a teaching improvement and knowledge building process that involves teachers working together to improve learning and be useable by other teachers. Also, another discussant mentioned as:

*Lesson study is really important to develop an experience through collaboration among teachers and improve your teaching method by observing the way how other teachers teach during lesson implementation and through comments from reflection.*

Through four detailed case studies Burghes and Robinson (2009) suggested that Lesson Study encourages all teachers in a school to collaborate in supporting and learning from each other and to regard problems as difficulties to be overcome, not as barriers to development. It also develops personal skills in being able to give and take constructive criticism without causing or taking offence, rather seeing it as a means to professional learning and fosters creativity, a willingness to take risks, try out new ideas and to share these experiences with colleagues.

This study is consistent with the study by Suhaili and Khalid (2011) in which teachers stated that lesson study is a professional development model that provides them with valuable and meaningful experiences and knowledge which were built during the process of reflection and collaboration with their peers and the 'knowledgeable others'. Moreover, in Lesson Study teachers obtained feedback on their own teaching and new ideas from watching how their colleagues taught including, teaching approach, teaching activity design and teacher-student interaction. This was likely to lead to demand for self and peer improvement (Lee, 2008).

Lesson Study is also important for modification of teaching and improves several weaknesses from comments given by other teachers during reflection. As one of the discussants suggested that lesson study enables them to produce good research papers and achieve local seminars or conferences related to pedagogy.

Lesson Study creates fertile ground for teachers to participate in local seminars or national conferences related to their profession which helps them to exchange knowledge and ideas like content based seminars which provide teachers with an opportunity to reflect and engage with peers in subject matter study and deepen their content knowledge. They also participate in seminars that deal on how to improve students' achievement, assessment methods and text book evaluations. In general, it helps teachers in participating in international conferences such as WALS (world association of lesson studies) where a lot of scholars from different countries collected and present their research which focuses on ensuring quality of education. Hence, the school teachers enroll and even present their work and get constructive comments that enables them to enhance and build their professional capacity.

#### 4. CONCLUSIONS

This study has found that lesson study has a positive relationship with the teachers' professional development. It improves knowledge of subject matter and their profession in general. Hence, the lesson study processes provide opportunities for colleagues to discuss freely and build their capacity to help them improve students' learning. It is a teaching improvement and knowledge building process through designing, implementing, observing, and reflecting research lessons.

The government and school authorities should play a significant role in creating awareness regarding the essence and importance, lesson study processes and allocating enough time for the teachers to meet and discuss so that lesson study will be a promising potential for better improvement of teachers' professional development as well as students' learning.

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## Using Teacher Self Reflection on Teacher Performance Assessment

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**Abstract:** Teacher Performance Assessment (TPA) employed by principal basically should be considered as peer assessment, concerning that principal is a teacher as well with additional certain tasks to manage schools. But, its implementation tends to be a one-way assessment from a superlative to the subordinate. Principal's sight on TPA, which is more focused on how teacher's teaching, does not provide enough space for teacher to give feedback or self reflection on his/her teaching. In fact, a self reflection of teacher could give a balance point of view on principal assessment. The research is aimed to describe a case of a certain secondary school where the principal using teacher self reflection as part of TPA by his own initiative. Having experienced with school wide lesson study during last 8 years, the principal decided to use this new approach as he is keen on to hear from the side of teacher in term of self reflection about students learning. To avoid a sporadic and unstructured self reflection, teachers are welcome to see the video or read its transcript to analyse the lesson. Samples are collected through two videotaped learning activities which assessed by principal using certain assessment format designated by board of education. Transcripts are made and gave to teachers after learning to be a reference for self reflection. Teachers convey on teaching and learning aspects should be improved, while principal wrote suggestion and mark on his assessment rubrics. The discussion applied comparing and classifying both approach in term of finding each focus. Self initiative to adopt self-reflection method as part of TPA might be another impact of collegiality of school wide lesson study.

**Keywords:** teacher performance assessment, self-reflection, school wide lesson study

### 1 INTRODUCTION

A principal in Indonesia is teacher with additional task to manage a school (The National Education Minister's Rule no. 28 Year 2010 about the employment of teacher as Principal). A principal must have five competencies, those are personality competency, managerial competency, entrepreneurship competency, social competency, and supervision competency. Supervision competency is one of the competencies which directly support an improvement of teachers' professionalism, in which the principal is responsible for planning, implementing, making a follow up of the result of supervision.

Class supervision, employed by the principal, is designed to enable teachers to improve the teachers' competence in managing teaching and learning

process well. The class supervision stresses on how teachers develop their professional competencies rather than asses their performance. That is why, method to optimize the class supervision should be organized systematically.

### 2. USING TEACHER SELF REFLECTION (TSR) ON TEACHER PERFORMANCE ASSESSMENT (TPA)

To obtain expected objective of supervision, the class supervision should facilitate an active interaction between teacher and principal. But, its implementation tends to be a one-way assessment from a superlative to the subordinate. Principals' sight on TPA, which is more focused on how

teachers’ teaching, does not provide enough space for teacher to give feedback or self reflection on his/her teaching. In fact, a self reflection of teacher could give a balance point of view on principal assessment.

Based on the statements above, in this paper the principal tries to find out the best way to carry out the class supervision using teacher self reflection. With an effective interaction between teachers and principal, it is hoped that the class supervision is not just judging the teachers’ methods in teaching, but to motivating the teachers to create more effective teaching and learning process in order to gain learning objectives. Teacher Self Reflection can develop the teachers’ self awareness in what they have done in managing the class, their strength and their weaknesses. At the same time, the teachers try to find out the better method to teaching in the future.

During the 8-years experience with School-based lesson study, principal of Lembang State Secondary School decided to uses such approach in conducting the class supervision to assess teachers’ performances. The principal listens more to the teachers’ self reflection related to the students’ learning. The objective of this research is to describe a certain school condition, in which the principal uses Teachers Self Reflection as part as Class Supervision to assess teachers’ performances. On the other hand, it is expected to be an inspiration for other principals who are interested in this case to implement and to develop model of class supervision in their schools to improve teaching and learning process.

### **3. THE STEPS OF USING TEACHER SELF REFLECTION ON TEACHER PERFORMANCE ASSESSMENT**

Before the class supervision based on schedule provided, principal asks teachers to submit their lesson plans and students worksheets which they will use in the class, and describe briefly the activities they will carry out in the class. The teacher teaches, while the principal observes that teaching and learning process. During the teaching and learning process, all the teacher and students’ activities are taken video by someone else. Several days after the class, the teachers are required to watch the video of their class activities, then she/he makes self-reflection to what they have done in their classes. Meanwhile, the principal makes some notes of the teaching and learning process using supervision-instrument. Researchers also make video transcripts as teacher and principals’ reference. Teachers and principal discuss the result of both sides. The principal ask the teachers to tell about their self reflection first. The discussion between the teachers

and the principal takes place intensely. The teachers convey their points of view of what they have done in their classes. They (principal and teacher) tell about the teaching and learning processes, which are good and which must be improved. The principal also tells his opinion about teaching and learning process. With the intensive discussion between both sides, it makes comprehensive and constructive understanding teacher performance assessment. So the result of assessment is more authentic and accurate. The teachers also realize what aspect must be retained and must be improved in the next lesson.

### **4. PROCEDURE**

In this research, the writer took two samples of teaching and learning video, those are Science and Social Science subjects. After the class observation of the two subjects, each teacher is required to watch their videos and also read the video transcripts. The data are taken from the teacher self reflection, principals’ notes of the observation and also the result of their discussion between each teacher and principal. The researcher obtained the result of teacher self reflections and the principal’s notes of the assessments. The researchers compare between the teacher self reflection and the principal’s assessment. The comparison is classified into the aspects of teacher performance assessment, as follow:

- a. Introduction: Apperception and Motivation, The delivery of Competencies to gain and delivery of activities to do to the students.
- b. Main Activity: Lesson mastery, The implementation of interesting strategy, The implementation of scientific approach, The use of leaning resources and learning media, Students’ participation, The use of good and correct language.
- c. Closing: Closing the class

## 5. RESULT

a. The assessment of Natural Science Teacher Performance :

Table 1. Teacher Performance Assessment in Natural Science Lessons

Assessment Aspects		Principals' notes	Teachers' Self Reflection
<b>Introduction</b>			
<b>Apperception and Motivation</b>			
1	Correlating the lesson with students' experiences or previous lesson	Relating to the plant classification	Asking the students previous lesson and let them tell animal classification based on their knowledge.
2	Asking question to students	Yes	Asking the students if they wanted to be scientist (liked exploring)
3	Telling students about lessons' benefit	The teacher did not tell before discussing	- The way to classify animals based on morphological characteristic - Telling the objective of animal classification in the end of the discussion
4	Demonstrating something related to theme or topic	Through the video	Showing video about animals' life and the benefit for humans' life
<b>Telling students about goal of competencies and activities</b>			
1	Telling the goal competencies	Yes, the teacher did	To classify animals
2	Telling the activities that will do during the class	It is mentioned explicitly	The students are required to work in group of 8.
<b>Main Activities</b>			
<b>Lesson Mastery</b>			
1	Lesson organization based on the learning objectives	Yes	Trying to use video and pictures of animals to gain the objective of learning.
2	Relating to the lesson material with other relevant knowledge, science development, technology and real life	Relating to the classification of plants and the students' previous knowledge	Explaining the benefit of invertebrata animal in industry and medicines.
3	Discussing lesson material with correct methods	As the same as the steps stated in the lesson plan	Discussing the lesson material based on what the students have done
4	Discussing the lesson material systematically (from the easy to difficult, from the concrete to abstract)	Discussion begins from the students' knowledge	Discussion begins with the classification based on the students' knowledge
<b>Implementing educative strategy in teaching and learning</b>			
1	Organizing learning process based on goal competencies	Yes, it is in line with the competence to achieve	Relating the lesson material to the value of God's greatness (KI.1) But it is not stated in detail.
2	Facilitating exploration, elaboration, and confirmation activities.	The students observe video, the pictures, open the references, make conclusion.	Beginning with asking the students, showing video to observe, dividing pieces of animal pictures to classify, and confirming the students' works.
3	Organizing the systematic learning process	Yes	Beginning with apperception, motivation, exploration, elaboration, confirmation, test.
4	Class mastery	Some students do not participate actively	Almost all students participated actively, but some students did not concentrate on the tasks and the teacher reminded them.
5	Implementing contextual learning process	Using the material around the class	Based on the available infrastructure and the students and teacher's need and ability

6	Arising students' positive habits in the learning process	Praying, Cooperating, Self confidence	Cooperating, correcting each other to develop their social care
7	Appropriate with the time allocated	Yes	Yes
<b>Implementing Scientific Approach</b>			
1	Giving the “Why” and “How” questions	Only a few	Although the teacher says why and how, the most propose question is what. This purpose is to trace students' mind and to lure so that it can be expressed
2	Motivating the students to ask	Not much	Give chance for the students in the end of every segment (introduction, main activities, and closing). Students propose many question when the teacher went around to each group, exploration and elaboration
3	Facilitating the students to do the experiment	Shown the picture	Give various media of animal pictures for try to classify into each group
4	Facilitating the students to observe	Shown the picture	Give more animal pictures for being observed their characteristic
5	Facilitating the students to analyze	Group discussion	Discussing in group, digging resource books to strengthen the analysis
6	Asking the students to think logically and systematically	Catechizing	Giving a sequence question, what-why-how
7	Facilitating the students to communicate	Learning group	Give chance to the group to communicate the work's result and it is appraised directly by other group, can give information or not from that presentation
<b>The use of learning resource/ learning media in the learning process</b>			
1	Using learning resources	Not clear	Using all of media from LCD, blackboard, picture that has been prepared before by teacher, and students' book
2	Using learning media.	Yes	Showed to the student and used it for learning resources
3	Resulting interesting impression	Yes, most of student involved	Do not know whether there is interesting things or no fo the students
4	Activating the students to use learning resources	Yes	students use available learning resources actively
5	Activating the students to use learning media	Lack in using media	Students use media that are prepared by teacher and blackboard to communicate result of study
<b>The students' involvement in the teaching and learning process</b>			
1	Facilitating students' active participation through teacher's interaction, students , and learning resources	Yes	Students interacted with teacher, friends, and learning materials
2	Responding the students' participation positively	Yes	Response and service students that need to be helped
3	Open-ended to the students' responses.	Yes	Give some warning to the students who disturb learning process
4	Showing comfort interpersonal relation	Yes	Students who consult privately are serviced overtly
5	Causing the students' cheer and enthusiasm	Yes	some students seen lack spirit for learning
<b>Using correct and appropriate language in learning process</b>			
1	Using clear and fluent oral language	Remains some incorrect word	Still mixed with the local dialect for response students' answer
2	Using good and correct written language	Yes	Divided blackboard into several parts to fill as many as needed
<b>Closing</b>			
<b>Closing the lesson</b>			
1	Making reflection or summary by involving the students	Yes via students' discussion result	Give a special mark in the blackboard as important things of students' work that will be a summary
2	Giving oral or written test	Yes via worksheet	Written test, besides from students' worksheet
3	Collecting the students worksheet for portfolio	Yes	Result of students' work are collected for being graded
4	Give feed-back of the lesson by reinforcement and giving the task	Yes	Clipping task about the use of animal for life

b. The assessment of Social Science Teacher Performance :

Table 2. Teacher Performance Assessment in Social Science Lessons

Assessment Aspects	Principal’s Note	Teacher’s self reflection
<b>Introduction</b>		
<b>Apperception and Motivation</b>		
1 Correlating the lesson with students’ experiences or previous lesson	Start with catechizing previous lessons	Teacher asks student about material that has been studied last week.
2 Asking question to students	Still lack	
3 Telling students about lessons’ benefit	delivered	Delivered implicitly
4 Demonstrating something related to theme or topic	Yes	Teacher demonstrated rain process’s experiment
<b>Telling students about goal of competencies and activities</b>		
1 Telling the goal competencies	Delivered by using projector	Delivered in the beginning of learning process
2 Telling the activities that will do during the class	Given in previous task	Tells that the activity will be done in group and ask the representative of each group to come forward.
<b>Main Activities</b>		
<b>Lesson Mastery</b>		
1 Lesson organization based on the learning objectives	Yes	
2 Relating to the lesson material with other relevant knowledge, science development, technology and real life	Yes, related with the daily needs of water	Related with good habits of drinks, dew, weather, etc.
3 Discussing lesson material with correct methods	Yes	Discussing the component and phenomena in demonstration
4 Discussing the lesson material systematically (from the easy to difficult, from the concrete to abstract)	Yes	Teacher explain steps of rain process demonstration directly
<b>Implementing educative strategy in teaching and learning</b>		
1 Organizing learning process based on goal competencies	Yes	Yes
2 Facilitating exploration, elaboration, and confirmation activities.	Yes, start from observing, opening the references and concluding	Yes
3 Organizing the systematic learning process	Yes	Yes, appropriate with lesson plan
4 Class mastery	Some students still lack in involvement of learning process	
5 Implementing contextual learning process	Using learning materials around environments	Using available tools
6 Arising students’ positive habits in the learning process	Praying, Cooperation	Students are remembered to be patient while doing experiment, use the water wisely, etc.
7 Appropriate with the time allocated	Yes	
<b>Implementing Scientific Approach</b>		
1 Giving the “Why” and “How” questions	Need to increase	
2 Motivating the students to ask	Still lack	
3 Facilitating the students to do the experiment	Water-cycle simulation	Students did not do the experiment (just like plan) because of lack hot water.

Assessment Aspects		Principal’s Note	Teacher’s self reflection
4	Facilitating the students to observe	Yes by demonstration	Yes
5	Facilitating the students to analyze	Yes	
6	Asking the students to think logically and systematically	Yes, after observing, each student makes a conclusion	
7	Facilitating the students to communicate	Group, but need to be monitored for the effectiveness of teamwork	
<b>The use of learning resource/ learning media in the learning process</b>			
1	Using learning resources	Yes	Yes
2	Using learning media.	Using projector	Yes
3	Resulting interesting impression	Yes	Students are reminded not to waste water
4	Activating the students to use learning resources	Still lack	Students are involved to bring tools and materials for experiment, prepare the class, and read the question in power-point.
5	Activating the students to use learning media	Students are involved in using projector	students are stimulated to observe phenomenon and assemble experiment set
<b>The students’ involvement in the teaching and learning process</b>			
1	Facilitating students’ active participation through teacher’s interaction, students , and learning resources	Teacher-students catechizing, group discussion	Teacher ask students to help her to do experiments, etc.
2	Responding the students’ participation positively	Yes	Say thanks to students because of their helps
3	Open-ended to the students’ responses.	Yes	indirectly judge incorrect students’ answer
4	Showing comfort interpersonal relation	Yes	answer a unique students’ question by using daily language that related with students
5	Causing the students’ cheer and enthusiasm	Yes	
<b>Using correct and appropriate language in learning process</b>			
1	Using clear and fluent oral language	Yes	
2	Using good and correct written language	Yes	
<b>Closing</b>			
<b>Closing the lesson</b>			
1	Making reflection or summary by involving the students	Yes by using worksheet	Students are asked to present their answer in worksheet as a summary of material that studied in that day
2	Giving oral or written test	Using worksheet	
3	Collecting the students worksheet for portfolio	Yes	students are asked to collect their task
4	Give feed-back of the lesson by reinforcement and giving the task	Yes	give task for next meeting



## 6. Discussion

Based on the result of principal assessment and teacher reflection, the data that has earned can show as follows:

- a. Natural Science Learning Process :

Table 3. Discussion of Natural Science Lessons

Assessment Aspects	Explanation
	<b>Introduction</b>
<b>Apperception and Motivation</b>	The result of assessment and teacher’s reflection show that all aspects are almost the same, except for learnings’ benefit was not delivered in the beginning of learning process but in the end after learning process has been finished.
<b>Telling students about goal of competencies and activities</b>	Both of teacher and principal agree that learning competences were delivered in the beginning of learning process, but the activities to do were not delivered although the teacher executed activities’ steps that suit with lesson plan.
	<b>Main Activities</b>
<b>Lesson Mastery</b>	Principal assessment and teacher reflection tell the same result that teacher showed a good Lesson Mastery.
<b>Implementation of educative learning strategy</b>	Principals’ assessment and teacher’s self reflection indicate the same thoughts that teacher’s learning process implementation appropriate with the goal competency, doing the activities that consist of exploration, elaboration and confirmation components, and implementing the systematically. Teacher can handle the class, implement contextual learning, arise positive custom, and the process finish in exact allocation time. But, there are some students that did not involve in the learning process well.
<b>Implementation of scientific approach</b>	Principal assume that the teacher still lack in giving “why” and “how” questions, and also in luring students to ask. In the other hands, teacher believes that she has made effort in giving “why” and “how” question. But, after discussion with the principal, both of them are aware that is so hard to make students ask critically because they still in VII grade and teacher is claimed to make students ask critical question continually. In other aspect, both of them have the same assessment result, such as facilitating students to try by using pictures, facilitating them to observe and analyze pictures, giving some questions to the students to think (logic and systematic thinking process) by catechizing about those pictures, and presenting students activities to communicate discussion result with their teammates.
<b>The use of learning media / material resources</b>	Teacher is competent in using lesson materials, but she did not assert student to find out from other references. Teacher show her skill when using media, making interesting impression, but students’ involvement is not enough in using other media such as LCD and computer to deliver their observation result so that it can be more interesting.
<b>Involving the students in learning process</b>	The same observation results tells that teacher grow active participation of students and responds it, open-ended with the students, show comfort interpersonal connection, made students enthusiastic and cheerful during learning process.
<b>Using correct and appropriate language in learning process</b>	Some oral language still incorrect and mixed with local dialect.
	<b>Closing</b>
<b>Lesson’s closing</b>	The same perception between teacher and principal refers that teacher has reflected or made conclusion with the student, gave oral or written test via worksheet that has been made, collected result of students’ worksheet as portfolio, and gave feed-back by giving instruction for next activities and task.
<b>Additional note of Teacher’s reflection result</b>	<ul style="list-style-type: none"> <li>- Based on teacher-student catechizing, the teacher still dominate learning process.</li> <li>- The teacher has difficulty in stimulate student to ask actively (braveness of VII grade students to ask and deliver their opinion still need to be improved)</li> </ul>
<b>Additional note from principal</b>	<ul style="list-style-type: none"> <li>- Teacher can stimulate the students to ask by showing the picture or video. After that, they were asked to propose questions about that. Teacher can give a reward for student that ask and tell their opinion.</li> </ul>

b. Social Science Learning Process

Table 4. Discussion of Social Science Lessons

Assessment Aspects	Explanation
<b>Introduction</b>	
<b>Apperception and Motivation</b>	Both principals’ assessment and teacher reflection agree that <ul style="list-style-type: none"> <li>- Learning process must be started by discussing or asking about the last material</li> <li>- Learning process did not give many challenge question</li> <li>- Teacher told the learning objectives</li> <li>- Teacher demonstrated an experiment related to raining process</li> </ul>
<b>Telling students about goal of competencies and activities</b>	Both principals’ assessment and teacher reflection agree that the teacher shows competencies that have to achieve by student after learning by projector and was mentioned by teacher in learning process
<b>Main Activities</b>	
<b>Lesson Mastery</b>	Both principal’s assessment and teacher reflection show that <ul style="list-style-type: none"> <li>- Learning material appropriate with the objectives of learning process</li> <li>- Teacher connect the material with students’ daily life such as using water</li> <li>- The systematical lesson material was given from easy to hard, from concrete to abstract.</li> </ul>
<b>Implementation of educative learning strategy</b>	Both principal’s assessment and teacher reflection show that <ul style="list-style-type: none"> <li>- Learning process is in line with the competencies that the students must have</li> <li>- Learning process consists of observing, collecting references, making conclusion and reinforcement</li> <li>- Learning process did well based on lesson plan</li> <li>- There was some students who attend the class passively</li> <li>- Renewal good habits such as praying before starting lesson, having good interaction in group, being patient while doing the experiment, being thrift in water usage</li> <li>- Learning finished on time</li> </ul>
<b>Implementation of scientific approach</b>	Teacher reflection <ul style="list-style-type: none"> <li>- Teacher still lacks of giving why and how question, and not enough in luring student to ask</li> <li>- Students were asked to observe the demonstration</li> </ul> Principal’s assessment <ul style="list-style-type: none"> <li>- Students were given a chance to analyze, to give reason, to communicate their result.</li> <li>- Teacher is still doubt to give notes during activities.</li> </ul>
<b>The use of learning media / material resources</b>	Teacher uses learning resources, media, projector, and blackboard well so it makes experiment become interesting. In principal opinion, teacher did not let student engage to use learning media so much. While in teacher opinion showed in teacher self reflection, student was participated in using media such as helping teacher prepare the experiment.
<b>Involving the students in learning process</b>	Both principal’s assessment and teacher reflection show that <ul style="list-style-type: none"> <li>- Teacher made student be active participate the lesson by interaction in teacher, student and material</li> <li>- Teacher gave positive responses in students’ participation</li> <li>- Teacher was open-ended to accept students’ response</li> <li>- Teacher showed comfort interpersonal relationship</li> <li>- Teacher made class was very interesting</li> </ul>
<b>Using correct and appropriate language in learning process</b>	Principals’ assessment show that teacher’s speech and teachers’ note were good and clear, although there was local

Assessment Aspects	Explanation
<p><b>Lesson’s closing</b></p> <p><b>Additional note of Teacher’s reflection result</b></p> <p><b>Additional note from principal</b></p>	<p>dialect. In this aspect teacher did not give their opinion</p> <p><b>Closing</b></p> <p>Both principal’s assessment and teacher reflection show that</p> <ul style="list-style-type: none"> <li>- Teacher let student reflect and conclude the lesson agreed with work sheet student made</li> <li>- Teacher evaluate lesson with group work sheet and give next task (home work)</li> </ul> <p>Doing learning which is students-oriented or students-centered is not easy, teacher must keep her practice to make lesson design that engaging student actively, furthermore for beginner class.</p> <ul style="list-style-type: none"> <li>- Point another student to comment her/his friend’s answer so that students pay attention to the discussion</li> <li>- Give reward to student who ask question or give their opinion for motivate student being active and confident</li> </ul>

## 7. CONCLUSION

Based on the research that have done, we can conclude that:

- a. Generally, teachers' self reflection and principal assessment show the same tendency of assessment result.
- b. When there are different opinion between principal and teacher, the interesting discussion occurs and gets conclusion that has been agreed by both of them for the better next lesson.
- c. Discussion between teacher and principal was more interesting because both sides were given chance to deliver each notes.
- d. Teacher performance assessment in lesson implementation by using the result of teacher self-reflection gives more comprehensive and constructive result to repair the next lesson.
- e. Teachers involved in assessing their own lessons actively, so that the assessment not occurs unilateral and teacher feels not being judged by principal
- f. The assessments' result which has been agreed can more propulsive for teacher to repair the lessons.
- g. Teacher has comprehensive knowledge during implement the learning process aspects.

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## Penggunaan Pembelajaran Terarah Secara Kendiri Dan Pembelajaran Kolaboratif Dalam Penulisan Karangan Naratif Dengan Menggunakan Simpulan Bahasa Untuk Murid Darjah 4

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**Abstract:** Simpulan bahasa merupakan satu peninggalan nenek moyang kita yang merupakan ungkapan yang telah mantap dan mempunyai maksud yang khusus. Sehubungan dengan itu, kertas kerja ini membincangkan bagaimana penggunaan Pembelajaran Terarah Secara Kendiri (SDL) dan Pembelajaran Kolaboratif (CoL) dapat memperbaiki gaya penulisan murid agar membantu perkembangan dalam menyatakan idea mereka dengan menggunakan simpulan bahasa. Kajian ini menggunakan kaedah Kajian Pengajaran untuk mengumpul dan menganalisis data. Disebabkan karangan naratif memerlukan idea yang kreatif, maka unsur kreativiti dan aspek gaya bahasa dalam penulisan juga perlu diberi keutamaan dalam proses latihan. Oleh itu, murid perlu didedahkan cara menulis karangan naratif menerusi latihan yang sistematik dan model penulisan yang sesuai. Dapatan kajian menunjukkan bahawa lebih ramai murid menggunakan simpulan bahasa dalam penulisan karangan mereka secara berkesan.

**Kata kunci:** Kajian Pengajaran, Simpulan Bahasa, Pembelajaran Terarah Secara Kendiri (SDL), Pembelajaran Kolaboratif (CoL), Karangan Naratif

### 1 PENGENALAN

Simpulan bahasa merupakan sebahagian daripada peribahasa yang merupakan susunan kata-kata yang dipilih khas, rapi, teratur dan mempunyai pengertian atau makna yang tertentu. Peribahasa dicipta oleh orang-orang Melayu dahulu hasil daripada pengalaman dan kehidupan seharian mereka. Menurut Tatabahasa Dewan Edisi Ketiga (2009), kata majmuk yang mendukung kiasan dianggap sebagai simpulan bahasa. Abbas Mohd Shariff (2006) pula menjelaskan simpulan bahasa mengandungi nilai yang membayangkan kehalusan budi.

Di peringkat Darjah 3 & 4, murid diajar aspek peribahasa yang merangkumi simpulan bahasa dan murid diberikan senarai simpulan bahasa yang perlu dipelajari. Murid sudah mula menulis karangan berperenggan dalam Darjah 3. Di peringkat ini, murid juga perlu tahu bagaimana untuk menyusun dan menulis ayat-ayat secara kronologi agar dapat dilihat kesinambungan dalam cerita/karangan yang ditulis. Ini penting dalam proses penulisan murid. Murid dikehendaki menulis ayat-ayat yang lengkap dan bermakna bagi menyatakan keinginan mereka dalam penulisan karangan. Selain itu, penggunaan simpulan bahasa dalam karangan bertujuan untuk memperindah bahasa dan juga menimbulkan daya tarikan. Karangan murid akan lebih menarik sekiranya simpulan bahasa yang digunakan menimbulkan unsur gaya dalam penulisan. Untuk menggunakan

simpulan bahasa dengan baik, murid hendaklah betul-betul memahami simpulan bahasa itu dan mengetahui tempat dan ketikanya simpulan bahasa itu sesuai digunakan.

Bagi menghasilkan penulisan karangan jenis naratif yang baik, murid bukan sahaja dituntut untuk mengolah sesuatu cerita dalam bentuk penulisan, malah mampu menerbitkan ayat-ayat serta ungkapan yang menggunakan perkataan dalam gaya bahasa yang indah dan menarik. Di samping itu, aspek susunan urutan cerita dan kerelevanan peristiwa juga akan menjamin kejelasan cerita dalam karangan jenis naratif. Penulisan karangan memerlukan kreativiti bagi menghasilkan nilai estetik serta menggunakan gaya bahasa yang tersendiri.

Penggunaan simpulan bahasa dalam penulisan karangan adalah penting untuk melengkapkan kemahiran menulis bagi seseorang murid di mana pembelajaran dan penghayatan simpulan bahasa itu sendiri bertujuan untuk meningkatkan keupayaan berbahasa dalam kalangan murid. Kemahiran berbahasa ini pula akan diteliti dalam konteks kebolehan murid menggunakan simpulan bahasa dalam aktiviti seharian dan penulisan. Hasil penulisan tentunya akan menjadi lebih indah dan bermutu sekiranya dimuatkan dengan simpulan bahasa yang tepat dan sesuai.

## 2 PERNYATAAN MASALAH

Secara am, murid menghadapi kesukaran memahami makna peribahasa. Berdasarkan keputusan peperiksaan akhir tahun 2012, pencapaian bagi komponen peribahasa ialah 74%. Berdasarkan analisis item bagi kohort murid Darjah 3 (2012), hanya 74% murid yang lulus bagi bahagian simpulan bahasa. Murid masih keliru akan penggunaan simpulan bahasa dalam ayat. Lazimnya, murid tidak dapat menggunakan simpulan bahasa yang sesuai mengikut konteks.

Murid didapati kurang minat dan usaha untuk mempelajari dan memahami makna peribahasa. Bagi keputusan karangan pula, 85% pelajar lulus dalam komponen ini dan hanya 10% murid sahaja yang memperoleh markah 15 dan ke atas bagi markah penuh 20. Murid dinilai dari segi isi dan penggunaan bahasa bagi penulisan karangan bergambar (empat gambar bersiri). Dalam penggunaan bahasa, murid digalakkan menggunakan frasa berbunga, peribahasa, penjodoh bilangan dan aspek-aspek tatabahasa yang lain yang boleh menjadikan hasil karangan murid lebih baik. Aspek penggunaan simpulan bahasa yang kurang diberikan perhatian oleh murid semasa menulis karangan menyebabkan kualiti penulisan juga kurang menarik.

Jabatan Bahasa Melayu telah melakarkan pengajaran berdasarkan pendekatan Pembelajaran Terarah secara sendiri (SDL) dan Pembelajaran Kolaboratif (CoL) bagi mengenengahkan aspek bahasa (pengajaran simpulan bahasa) dan nilai murni.

## 3 TUJUAN KAJIAN

Penulisan yang menggunakan simpulan bahasa juga dapat menjamin wujudnya nilai estetik dalam penulisan murid. Bagi pihak guru pula kajian ini diharapkan mampu memberikan gambaran pencapaian dan tahap kemahiran murid menggunakan simpulan bahasa di dalam penulisan karangan mereka. Melaluinya juga guru dapat membuat persediaan yang lebih baik semasa mengajarkan karangan naratif kepada murid.

Kajian ini bertujuan untuk mengenal pasti:

1. keberkesanan penggunaan simpulan bahasa dalam penulisan karangan naratif murid Darjah 4; dan
2. keberkesanan penggunaan simpulan bahasa dalam memperbaiki gaya penulisan dan pengembangan idea murid.

## 4 KAJIAN LITERATUR

Penggunaan pendekatan SDL dan CoL dalam kajian ini sejajar dengan matlamat ICT iaitu:

1. menggalakkan integrasi ICT ke dalam kurikulum sekolah;
2. memudahkan keberkesanan penggunaan ICT dalam pentadbiran sekolah;
3. menyediakan kakitangan sekolah dengan pembangunan ICT untuk menyokong integrasi ICT ke Program Pendidikan dan fungsi-fungsi pentadbiran sekolah; dan
4. memberi pelajar pendedahan kepada ICT di luar kurikulum sekolah.

Antara ciri-ciri utama SDL yang dikenal pasti ialah pemilikan dalam pelajaran, pengurusan dan pemantauan pembelajaran secara sendiri, dan lanjutan dalam pelajaran. Ciri-ciri utama CoL pula termasuk proses kerja berkumpulan yang berkesan dan kebertanggungjawaban individu dan kumpulan pembelajaran.

SDL merupakan suatu pembelajaran yang berkesan kerana dapat menjadikan murid lebih bersedia dan bermotivasi untuk belajar. CoL pula melibatkan sekumpulan murid yang berusaha bersama ke arah mencapai prestasi dan matlamat yang sama. Dengan kata lain, SDL dan CoL dapat membantu guru meningkatkan keberkesanan pengajaran dan pembelajaran dalam bilik darjah.

SDL dan CoL disokong oleh Kementerian Pendidikan di bawah inisiatif “*The ICT Connection*”. Menurut Gibbons (2002), pembelajaran terarah secara sendiri atau SDL melibatkan usaha peribadi dalam aktiviti yang mencabar dan membina kemahiran dan pengetahuan sendiri untuk menempuh cabaran dengan jayanya.

Barkley (2002) pula menjelaskan bahawa pembelajaran secara kolaborasi ialah aktiviti yang melibatkan murid bekerjasama secara berpasangan atau kumpulan menyelesaikan sesebuah masalah atau mencapai objektif pembelajaran yang sama.

## 5 KAEDAH KAJIAN

Kajian ini dijalankan menggunakan pendekatan Kajian Pengajaran sebanyak dua kitaran. Penghasilan kajian ini dilaksanakan di dalam bilik darjah dan setiap pasangan murid diberikan sebuah komputer riba. Murid sudah diperkenalkan dengan simpulan bahasa yang akan digunakan dalam kajian ini. Hasil kerja yang diharapkan ialah pelajar dapat menghasilkan karangan naratif berdasarkan gambar bersiri empat yang mengandungi sebanyak mungkin simpulan bahasa yang telah dipelajari.

Sebelum menjayakan kajian ini, murid sudah tahu menulis karangan naratif yang berperenggan.

Ini termasuk bentuk, bahasa dan struktur sebuah karangan naratif.

Reka bentuk kajian ini menggunakan pendekatan kualitatif dengan menggunakan data yang diperoleh melalui cara pemerhatian, respons murid dan analisis karangan murid.

Perbincangan berkaitan penggunaan simpulan bahasa diberikan sebelum aktiviti menulis karangan dimulakan. Masa yang diperuntukkan untuk menulis karangan (dengan menggunakan sekurang-kurangnya 80 patah perkataan) tersebut adalah 40 minit.

Setiap karangan diperiksa dan dianalisis untuk mengenal pasti bilangan simpulan bahasa yang digunakan dalam karangan dan kesesuaian simpulan bahasa yang digunakan dalam ayat atau teks. Statistik berbentuk peratusan digunakan untuk menyatakan kekerapan penggunaan simpulan bahasa dalam penulisan karangan. Pemarkahan juga diberikan di mana markah penuh bagi bahagian isi atau kandungan karangan ialah 8 dan bahasa pula ialah 7 markah.

#### Subjek Kajian

Kumpulan sasaran bagi kajian ini ialah murid bahasa Melayu Darjah 4 (4ML2). Secara umum, tahap keupayaan murid adalah sederhana. Sebanyak 23 orang murid dipilih sebagai sampel kajian. Mereka diminta menuliskan sebuah karangan berbentuk naratif berdasarkan empat gambar bersiri.

#### Instrumen Kajian

Keberkesanan kajian ini dipantau melalui penggunaan rubrik, respons murid menerusi “*Social Learning Wall*” dan perkongsian pendapat di laman linoit.com, markah yang diperoleh melalui Permainan iFlash dan karangan naratif. Dapatan daripada yang disebutkan di atas boleh dinilai secara kualitatif. Rubrik yang digunakan mempunyai lapan bahagian yang cuba menyelidik pemikiran dan pembelajaran murid bagi setiap langkah/aktiviti semasa pembelajaran dijalankan (lihat lampiran 3).

#### Prosedur Kajian

Sebelum kajian pengajaran dijalankan, guru terlebih dahulu mendedahkan kepada murid simpulan bahasa yang ingin diajar. Murid juga dikehendaki memahami makna dan penggunaan simpulan bahasa seperti hati emas, ada hati, ambil hati, besar hati, keras hati dan murah hati. Langkah-langkah pengajaran adalah seperti berikut.

#### Induksi

Guru menayangkan klip video di mana murid dikehendaki menyatakan nilai-nilai murni (contoh: kasih sayang, tanggungjawab, balas jasa, tabah/cekal) yang terdapat dalam klip video tersebut. Secara tidak langsung apabila murid dapat menyatakan nilai-nilai murni tersebut, murid juga dapat mengaitkan nilai tersebut dengan simpulan bahasa yang sesuai. Murid juga digalakkan

memberikan simpulan bahasa lain yang tidak terdapat dalam senarai yang diberikan.

#### Langkah 1 (kerja berpasangan) – hasil pembelajaran (SDL)

Untuk mengukuhkan lagi pemahaman murid tentang simpulan bahasa tersebut, guru menayangkan simpulan bahasa, makna dan contoh ayat kepada murid dalam bentuk titik kuasa. Sebagai aktiviti pengukuhan, secara berpasangan murid mencuba permainan interaktif simpulan bahasa yang direka cipta sendiri menggunakan perisian *iFlash Game* melalui komputer riba yang disediakan. Murid hanya diberikan satu peluang untuk menjawab soalan dan perlu juga mencatatkan pencapaian mereka dalam borang yang diberikan.

#### Langkah 2 (kerja berpasangan) – hasil pembelajaran (SDL & CoL)

Guru memuatnaikkan teks bacaan ke laman linoit.com dan kemudian murid membaca petikan itu. Selepas membacanya, murid dikehendaki memberikan sekurang-kurangnya satu simpulan bahasa berserta maknanya yang berkaitan dengan petikan tersebut. Kemudian, murid memberikan refleksi atau respons peribadi tentang petikan yang dibaca melalui “*Social Learning Wall*” yang boleh didapati melalui *MCOonline*.

Soalan rangsangan yang diberikan adalah seperti yang berikut:

1. Apakah perasaan kamu setelah membaca petikan itu? Jelaskan.
2. Adakah kamu akan melakukan perkara yang sama? Mengapa?

#### Langkah 3 (kerja kumpulan) – hasil pembelajaran (CoL)

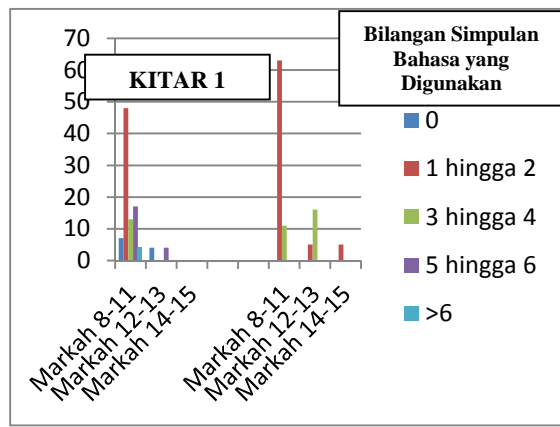
Guru membahagikan murid kepada 4 kumpulan. 4 gambar bersiri ditayangkan terlebih dahulu agar murid mengetahui dan faham akan jalan ceritanya. Kemudian, setiap kumpulan diberikan sekeping gambar yang berlainan yang diambil daripada 4 gambar bersiri yang ditunjukkan. Dalam kumpulan masing-masing, murid mengarang cerita dalam satu perenggan berdasarkan gambar yang diberikan dengan menggunakan sekurang-kurangnya 2 simpulan bahasa yang telah dipelajari. Sejurus itu, secara berkumpulan murid melihat hasil kerja rakan mereka melalui aktiviti Lintas Galeri. Murid digalakkan menilai dan membetulkan kesalahan yang dikenal pasti, sekira ada, serta memberikan pendapat tentang hasil kerja tersebut. Guru kemudiannya merumuskan dapatan hasil kerja kumpulan.

Aktiviti Susulan (kerja individu)

Berdasarkan 4 gambar bersiri yang sama, murid menulis karangan dengan menggunakan sekurang-kurangnya 4 simpulan bahasa yang telah dipelajari. Aktiviti ini dijalankan dalam waktu kurikulum pada hari berikutnya. Guru kemudiannya, memeriksa dan menilai hasil karangan murid serta mengenal pasti data-data yang diperlukan seperti jumlah simpulan bahasa yang digunakan serta penggunaannya dalam ayat/teks dan pemarkahan bagi menilai isi dan penggunaan bahasa dalam karangan itu sendiri.

**6 DAPATAN KAJIAN DAN PERBINCANGAN**

Daripada data yang dikumpulkan melalui penggunaan rubrik, didapati lebih ramai murid telah menggunakan simpulan bahasa dalam karangan naratif yang dibina. Dibandingkan dengan penulisan karangan yang sebelumnya, pelajar yang mendapat markah rendah juga cuba menggunakan simpulan bahasa dalam penulisan karangan. Lebih ramai murid yang sederhana menggunakan simpulan bahasa secara berkesan dalam penulisan karangan mereka. Sila lihat **Carta 1** bagi perincian dapatan mengenai penggunaan simpulan bahasa dalam penulisan murid.



Carta 1: % Murid yang Menggunakan Simpulan Bahasa dalam Karangan Naratif

Pendekatan kajian pengajaran yang dijalankan telah membuahkan hasil yang positif dari segi pencapaian murid dan pengajaran guru. Daripada pemerhatian yang dijalankan, pelibatan murid didapati lebih aktif dalam proses pembelajaran. Hal ini dapat diteliti dengan lebih lanjut dalam **Lampiran 1**.

Selain daripada itu, kami dapati kajian ini juga menunjukkan bahawa dengan menggunakan simpulan bahasa yang sesuai dengan konteks atau jalan cerita serta pembinaan ayat yang gramatis dapat menambah nilai penulisan karangan naratif murid. Ini menjadikan lebih ramai murid yang mendapat markah yang lebih tinggi setelah menjalani kitar 2 dalam kajian pengajaran ini.

**7 KESIMPULAN**

Kesimpulannya, subjek kajian masih belum begitu mahir dalam menggunakan simpulan bahasa yang melambangkan nilai estetik dalam penulisan karangan mereka. Implikasi kajian ini terhadap kurikulum adalah wujudnya keperluan dan kepentingan mengajarkan aspek simpulan bahasa dalam penulisan karangan primari pertengahan. Penggunaan simpulan bahasa dalam karangan naratif dapat meningkatkan lagi mutu penulisan murid.

Berdasarkan dapatan kajian, beberapa cadangan boleh dikemukakan untuk tujuan memperbaiki mutu penulisan karangan naratif murid. Pendedahan secara eksplisit mengenai penggunaan simpulan bahasa dalam karangan perlu diberitahu kepada murid. Untuk tujuan tersebut guru perlu memberikan maklumat berkaitan simpulan bahasa dengan menggunakan teknik dan kaedah mengajar yang lebih sesuai. Guru boleh memberikan senarai simpulan bahasa yang boleh digunakan semasa menulis karangan. Walau bagaimanapun, murid perlulah memahami maksud simpulan bahasa terlebih dahulu sebelum menggunakannya dalam penulisan mereka. Oleh sebab dalam penulisan naratif memerlukan idea yang kreatif, unsur kreativiti dalam penulisan juga perlu diberi keutamaan. Oleh itu, murid perlu didedahkan kepada model penulisan yang sesuai dan cara penulisan karangan naratif menerusi latihan terbimbing dan sistematik. Hal ini pasti membantu pembelajaran murid.

**8 RUJUKAN**

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 Jeremy Harmer (2004). How to Teach Writing. Harlow: Pearson Education Limited.  
 Marohaini Yusoff (2004). Perlakuan dan Proses Menulis Karangan Bahasa Melayu. Kuala Lumpur: Penerbit Universiti Malaya.  
 Nik Safiah *et al* (2009). Tatabahasa Dewan. Kuala Lumpur: Dewan Bahasa dan Pustaka  
<http://ictconnection.moe.edu.sg>





**Lapor Balik Kajian Pengajaran**

Kitaran Pertama	Kitaran kedua
<p><b><u>Induksi:</u></b></p> <ul style="list-style-type: none"> <li>• Guru sepatutnya imbas kembali video untuk memberikan contoh-contoh konkrit kepada murid.</li> <li>• Murid tidak pasti akan nilai-nilai dan teragak-agak menjawab soalan guru.</li> <li>• Murid hanya dapat sebutkan kasih sayang dan membalas jasa sebagai nilai.</li> </ul> <p><b><u>Saranan:</u></b></p> <ul style="list-style-type: none"> <li>➢ Rancangan Pengajaran Kitaran 2 harus disertakan dengan soalan-soalan rangsangan dan boleh dikaitkan dengan nilai teras sekolah.</li> <li>➢ Perkataan ‘nilai’ boleh digantikan dengan ‘perkara baik’ dan guru berikan contoh untuk merangsang murid menjawab soalan.</li> </ul>	<p><b><u>Induksi:</u></b></p> <ul style="list-style-type: none"> <li>• Kualiti video lebih baik dan menyentuh hati murid.</li> <li>• Video kali ini lebih mudah untuk murid fahami.</li> <li>• Murid lebih mudah memberikan contoh sifat kepada watak daripada memberikan contoh nilai.</li> <li>• Murid lebih banyak memberikan bukti-bukti mengenai video.</li> <li>• Murid dapat berikan contoh simpulan bahasa yang lain seperti baik budi dan memberikan maknanya sekali.</li> <li>• Murid dapat kaitkan pelbagai simpulan bahasa menerusi contoh dalam video.</li> </ul> <p><b><u>Saranan:</u></b></p> <ul style="list-style-type: none"> <li>➢ Guru dapat menggunakan aktiviti ini untuk menambah tentang nilai murni.</li> <li>➢ “<i>Teachable moments</i>” sepatutnya dilakukan selepas menonton video.</li> </ul>
<p><b><u>Langkah 1.1</u></b></p> <ul style="list-style-type: none"> <li>• Murid tidak pasti dan keliru menjawab soalan sebab/akibat.</li> <li>• Banyak pasangan mulakan dengan akibat dahulu, baru mereka menulis sebab.</li> <li>• Murid ambil masa yang lama untuk membuka pautan Linoit.</li> <li>• Guru pemantau harus membantu murid.</li> <li>• Petikan teks terlalu panjang.</li> </ul> <p><b><u>Saranan:</u></b></p> <ul style="list-style-type: none"> <li>➢ Tulis simpulan bahasa sahaja dahulu dan tulis pendapat murid di “<i>Social Learning Wall</i>”.</li> <li>➢ Aktiviti menulis sebab/akibat ditiadakan.</li> </ul> <p><b><u>Langkah 1.2</u></b></p> <ul style="list-style-type: none"> <li>• Ramai murid membuang masa menaip nama.</li> <li>• Murid masih kurang pasti menggunakan</li> </ul>	<p><b><u>Langkah 1.1</u></b></p> <ul style="list-style-type: none"> <li>• Banyak penglibatan murid kali ini.</li> <li>• Murid juga dapat berikan ayat lain setelah lihat contoh ayat dalam slaid.</li> </ul> <p><b><u>Saranan:</u></b></p> <ul style="list-style-type: none"> <li>➢ Guru perlu mendekati murid jika suara murid terlalu perlahan.</li> </ul> <p><b><u>Langkah 1.2</u></b></p> <ul style="list-style-type: none"> <li>• Terdapat masalah teknikal, “<i>server</i>” agak lambat.</li> <li>• Murid sudah terbiasa dengan sistem/lelaman yang diajar guru.</li> <li>• Guru tidak benarkan murid masuk ke lelaman (<i>log-in</i>) dahulu sama seperti kitaran 1.</li> <li>• Ada murid yang cuba letakkan jawapan dan baca keseluruhan ayat sebelum memeriksa jawapan dalam Permainan</li> </ul>

<p>Linoit.</p> <ul style="list-style-type: none"> <li>• Murid dapat berikan simpulan bahasa.</li> <li>• Guru dapat menggulung pengajaran dan berikan nilai 'beri' sebagai 'si pemberi' (murah hati) dan nilai 'terima' sebagai 'si penerima' (besar hati).</li> </ul> <p><b>Langkah 1.3</b></p> <ul style="list-style-type: none"> <li>• Dibuat sebagai kerja rumah (Tidak dapat dijalankan)</li> </ul> <p><b>Saranan</b></p> <ul style="list-style-type: none"> <li>➤ Langkah 1.1 (sebab/akibat) dijadikan sebagai Langkah 1.3 (beri pendapat tentang video).</li> </ul>	<p>iFlash (murid visual)</p> <ul style="list-style-type: none"> <li>• Kepelbagaian bagi cara pembelajaran murid.</li> <li>• Proses cara berfikir murid amat ketara melalui proses pemilihan jawapan.</li> </ul> <p><b>Saranan</b></p> <ul style="list-style-type: none"> <li>➤ "Plug in" di hadapan kelas supaya talian internet/"server" lebih baik.</li> </ul>
<p><b>Langkah 2.1</b></p> <ul style="list-style-type: none"> <li>• Perbaiki rubrik.</li> <li>• Langkah untuk pengajaran menggunakan slaid PPT disertakan.</li> <li>• Fon putih kurang jelas.</li> <li>• Guru harus menambahkan penglibatan murid.</li> <li>• Guru baca simpulan bahasa, makna dan ayat (<i>teacher talk</i>).</li> </ul> <p><b>Saranan</b></p> <ul style="list-style-type: none"> <li>➤ Perkataan pada slaid harus silih berganti agar tidak terlalu mengelirukan.</li> <li>➤ Tiadakan makna simpulan bahasa apabila ayat contoh ditunjukkan. Fon putih tukar, spacing dibaiki.</li> </ul> <p><b>Langkah 2.2</b></p> <ul style="list-style-type: none"> <li>• Rubrik murid diperbaiki.</li> <li>• Murid lebih bertenaga dan dapat dilihat keceriaan murid dengan kerja pasangan interaktif.</li> <li>• Murid berbincang dan dapat berikan sebab mengapa jawapan itu dipilih.</li> <li>• Murid dapat menjawab soalan dan melengkapkan aktiviti dalam tempoh yang diberikan.</li> </ul> <p><b>Saranan</b></p> <ul style="list-style-type: none"> <li>➤ Guru berikan contoh di layar. 'Print Screen' contoh arahan permainan dan sebagainya.</li> </ul>	<p><b>Langkah 2.1</b></p> <ul style="list-style-type: none"> <li>• Murid lebih terlibat.</li> <li>• Ada murid yang bekerja secara berpasangan untuk memastikan jawapan mereka betul.</li> <li>• Sikap saling membantu dapat diketengahkan.</li> <li>• Murid tidak buang masa untuk menghantar respons mereka.</li> </ul> <p><b>Saranan</b></p> <ul style="list-style-type: none"> <li>➤ Tunjukkan teks di skrin utama agar murid dapat baca dan tulis komen mereka.</li> <li>➤ Guru memberi komen selepas aktiviti ini agar ada kesinambungan.</li> </ul> <p><b>Langkah 2.2</b></p> <p><b>Saranan</b></p> <ul style="list-style-type: none"> <li>➤ Peruntukkan masa yang lebih panjang kerana murid perlu berfikir tentang sebab dan akibatnya.</li> <li>➤ "Social Learning Wall" digunakan selepas itu agar tidak mengelirukan murid.</li> </ul>

**Langkah 3:**

- Murid boleh berikan idea tetapi kosa kata terhad dan hadapi kesukaran menuliskan idea.
- Murid ada selitkan pengalaman mereka.
- Murid dapat memperbaiki dan menambah idea rakan, berikan arahan dan bergilir-gilir berikan idea.
- Murid komen ayat rakan.

**Saranan**

- Guru tayangkan gambar karangan secara keseluruhan.
- Perkataan/frasa diberikan untuk setiap gambar.
- Lanjutkan masa kerja kumpulan dari 10 minit ke 15 minit.
- Tunjukkan kriteria/panduan sebelum menjalankan ‘*Gallery Walk*’.
- Adakan rubrik untuk ‘*Gallery Walk*’.

**Langkah 3.1**

- Murid dapat mengenalpasti dan memperbaiki kesalahan rakan.
- Guru menunjukkan gambar dan merancah murid menulis cerita.

**Saranan**

- Murid harus diberikan masa yang lebih.
- Murid sentiasa diingatkan menulis simpulan bahasa yang terdapat dalam gambar.

**Langkah 3.2**

- Ada murid yang boleh mengenal pasti kesilapan penggunaan simpulan bahasa dalam kumpulan lain. Penggunaan ‘*murah hati*’, ramai murid kurang pasti akan penggunaannya. Keliru dengan ‘*hati emas*’.
- Murid dapat menyarankan cara memperbaiki ayat. Contoh: Tidak boleh mulakan ayat dengan ‘*kerana*’.

**Saranan**

- Guru mengajar semula simpulan bahasa dan menekankan tentang makna ‘*murah hati*’.
- Guru boleh berikan alternatif simpulan bahasa lain yang boleh digunakan.

**Data Rubrik - Kajian Pengajaran 2013**

Langkah 1.2 (Kerja Pasangan)	1. Murid dapat menjawab soalan dengan betul. (Permainan iFlash)					Ya	Tidak									
<i>Respons Murid:</i>	<b>% Murid yang dapat menjawab soalan pada percubaan pertama.</b>															
		<b>Soalan 1</b>	<b>Soalan 2</b>	<b>Soalan 3</b>	<b>Soalan 4</b>	<b>Soalan 5</b>	<b>Soalan 6</b>									
	<b>Kitar 1</b>	60	90	70	70	90	70									
	<b>Kitar 2</b>	100	100	75	100	100	100									
<b>Aktiviti Susulan (Karangan Naratif)</b>	<b>Dapatan Kitar 1 (4ML2) Bilangan Murid - 23</b>															
	<b>Markah</b>	<b>14-15</b>					<b>12-13</b>					<b>8-11</b>				
	<b>Bilangan Murid</b>	<b>0 (0%)</b>					<b>2 (8.7%)</b>					<b>21 (91.3%)</b>				
	<b>Bilangan Simpulan Bahasa yang digunakan</b>	0	1	3	5	> 6	0	1	3	5	> 6	0	1	3	5	> 6
	0	0	0	0	0	0	1	0	0	1	2	1	3	4	1	
<b>Aktiviti Susulan (Karangan Naratif)</b>	<b>Dapatan Kitar 2 (4ML2) Bilangan Murid – 19 (4 tidak hadir)</b>															
	<b>Markah</b>	<b>14-15</b>					<b>12-13</b>					<b>8-11</b>				
	<b>Bilangan Murid</b>	<b>1 (5.3%)</b>					<b>4 (21.1%)</b>					<b>14 (73.6%)</b>				
	<b>Bilangan Simpulan bahasa yang digunakan</b>	0	1	3	5	> 6	0	1	3	5	> 6	0	1	3	5	> 6
	0	1	0	0	0	0	1	3	0	0	0	1	2	0	0	

**Contoh Rubrik - Kajian Pengajaran**

Pemerhati: \_\_\_\_\_ Tarikh: \_\_\_\_\_ Kumpulan : \_\_\_\_\_

<b>Induksi</b>	1. Murid dapat memberikan nilai/perkara baik berdasarkan iklan.						
<b>Nilai-nilai</b>	<b>Kasih sayang</b>	<b>Tanggung jawab</b>	<b>Membalas jasa</b>	<b>Tabah / cekal</b>			
<b>Respons Murid:</b>	_____ _____ _____						
<b>Catatan Guru:</b>	_____ _____ _____						
<b>Induksi</b>	2. Murid dapat mengenal pasti simpulan bahasa yang sesuai berdasarkan nilai.						
<b>Simpulan bahasa</b>	<b>Hati emas</b>	<b>Ada hati</b>	<b>Ambil hati</b>	<b>Besar hati</b>	<b>Keras hati</b>	<b>Murah hati</b>	
<b>Respons Murid:</b>	_____ _____ _____						
<b>Catatan Guru:</b>	_____ _____ _____						
<b>Langkah 1.1</b>	2. Murid dapat meneka makna simpulan bahasa dan menggunakannya di dalam ayat (Persembahan slaid)					<b>Ya</b>	<b>Tidak</b>
<b>Respons Murid:</b>		Simpulan bahasa	Dapat memberikan makna yang betul (tanda <input checked="" type="checkbox"/> )	Dapat memberikan ayat yang betul (tanda <input checked="" type="checkbox"/> )			
	1	Hati emas					
	2	Ada hati					
	3	Ambil hati					
	4	Besar hati					
	5	Keras hati					
	6	Murah hati					
	_____ _____						

	_____							
<b>Catatan Guru:</b>	_____							
<b>Langkah 1.2 (Kerja pasangan)</b>	3. Murid dapat menjawab dengan betul. (permainan Flash)						<b>Ya</b>	<b>Tidak</b>
<b>Respons Murid:</b>	Tandakan (✓) jika percubaan pertama betul.							
		Soalan 1	Soalan 2	Soalan 3	Soalan 4	Soalan 5	Soalan 6	
	Pasangan 1							
	Pasangan 2							
	Pasangan 3							
	_____							
	_____							
	_____							
<b>Catatan Guru:</b>	_____							
	_____							
	_____							
<b>Langkah 2.1</b>	1. Murid dapat memberikan sekurang-kurangnya 1 simpulan bahasa yang sesuai dan makna yang betul berdasarkan petikan. (Linoit)						<b>Ya</b>	<b>Tidak</b>
<b>Respons Murid:</b>		Simpulan bahasa			Dapat memberikan makna yang betul (tandakan ✓)			
	Pasangan 1							
	Pasangan 2							
	Pasangan 3							
	_____							
	_____							
	_____							
<b>Catatan Guru:</b>	_____							
	_____							
	_____							

<b>Langkah 2.2</b>	2. Murid dapat memberikan pendapat tentang petikan menggunakan 'Social Learning Wall'.	<b>Ya</b>	<b>Tidak</b>
<b>Respons Murid:</b>	<hr/> <hr/> <hr/>		
<b>Catatan Guru:</b>	<hr/> <hr/> <hr/>		
<b>Langkah 3.1</b>	1. Murid dapat menulis sekurang-kurangnya 2 simpulan bahasa dalam satu perenggan berdasarkan gambar.	<b>Ya</b>	<b>Tidak</b>
<b>Respons Murid:</b>	<hr/> <hr/> <hr/>		
<b>Catatan Guru:</b>	<hr/> <hr/> <hr/>		
<b>Langkah 3.2</b>	2. Murid dapat memberikan komen yang berkesan tentang hasil kerja kumpulan lain. (Gallery Walk)	<b>Ya</b>	<b>Tidak</b>
<b>Respons Murid:</b>	<hr/> <hr/> <hr/>		
<b>Catatan Guru:</b>	<hr/> <hr/> <hr/>		
<b>Aktiviti Susulan (Lembaran Kerja)</b>	1. Murid dapat menulis karangan naratif (bergambar) menggunakan simpulan bahasa yang telah dipelajari.	<b>Ya</b>	<b>Tidak</b>
	<b>Markah</b>	<b>14-15</b>	<b>12-13</b>
	<b>Bilangan Murid</b>		<b>8-11</b>

	Bilangan Simpulan bahasa yang digunakan															
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## An Evolving Research Mathematics Lesson Through Lesson Study

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**Abstract:** This paper discusses the evolution of a mathematics research lesson in a Lesson Study (LS) cycle. The lesson was aimed to develop primary five pupils' concept of volume of three dimensional (3D) solid shapes. The lesson was developed by a LS group that made of five primary mathematics teachers attached to a Chinese primary school located in a semi-rural area. Data collected for analysis include video recordings of the whole LS process: refining lesson plan-first teaching-reflection-revising lesson plan-re-teaching-second reflection. Preliminary analysis revealed that the research lesson was a challenging lesson that the teacher attempted to develop pupils' understanding of an abstract concept such as volume. In the first teaching, the teacher tried to concretise the concept by using concrete objects, such as Rubik's cube, but she failed to make the pupils understand that volume is the amount of space in a 3D object. Through active discussion and reflection with peer support, the lesson was revised and re-taught to a second group of pupils. Analysis of the re-teaching indicated that the teacher's explanation was better understood by the pupils after revising the teaching strategies. However, the dismantling of the Rubik's cube still failed to bring out the idea of volume as the amount of space occupied in a cube. Nevertheless, the evolution of the mathematics lesson was explicitly connected to the result of discussion and reflection in the Lesson Study process. The process had provided not only reflective teaching, but also peer support for these teachers to explore new teaching approaches, and enhance their own conceptual understanding.

**Keywords:** Lesson Study, research lesson, teaching of volume.

### 1 INTRODUCTION

Exploring the teaching and learning process became the focus of recent studies. This can be due to the fact that pupils' learning is inseparable from the teaching and learning process. Furthermore, to improve the pupils' learning, the teacher's pedagogical practices hold the key to enhance the pupils' learning. Thus, this study was conducted to analyse the pedagogical flow of the research mathematics lesson through the implementation of Lesson Study (LS) process in three primary schools. Pedagogical flow can be defined as the teaching and learning process that comprises of four main components: teacher, pupils, content, and classroom resources. This study was part of the larger project which aimed to improve the mathematics and science teachers' teaching practices through the LS process in seven primary schools in Malaysia.

In this paper, we focused our discussion on a group of five mathematics teachers from one of the project schools who had undergone a LS cycle. The main aim of this paper was to discuss the evolution of a research mathematics lesson in a LS cycle.

More specifically, this paper analyse the changes or differences (if any) between the initial and the refine research lesson.

### 2 LITERATURE REVIEW

#### 2.1 Pedagogical Flow

Pedagogy is a complicated term to be defined. As defined by Murphy (1996), pedagogy is an art that related to “interactions between teachers, students and the learning environment and learning tasks” (p.35). While Watkins and Mortimore (1999) mentioned that pedagogy is “any conscious activity by one person designed to enhance the learning of another” (p.3). Thus, pedagogy can be defined as activity that interconnected between teachers, pupils, content and learning environment to improve pupils' learning.

The term flow can be defined as the experience flow (Csikszentmihalyi, 1990) whereby the teacher conducted a lesson follows his/her experience. On one hand, according to Oxford Advanced Learner's dictionary (2010), flow can be defined as a

“continuous movement” (p. 595). In this study, it refers to the continuous process of teaching and learning during a particular lesson. By joining these two definitions, flow can be defined as the teaching and learning process that comprises of teacher’s flow of experience in conducting it.

Furthermore, Schmidt et al. (2002) proposed three key dimensions in characterising the pedagogical flow as such: “the complexity and representation of a lesson’s content, how the content is presented to and encountered by students, and how the teacher and students interact around the lesson’s content” (p.83). Meanwhile, Hiebert et al. (2003) examined the elements of mathematics lesson structure such as: the time devoted on mathematics, the types of activities used, the objectives of various lesson segments, the interactions during the lesson, the role of homework and other factors that influence the lesson flow.

Therefore, from the review of these studies, the pedagogical flow can be defined as a continuous teaching and learning process that consists of a series of activities which comprises of four main components: teacher, pupils, content, and classroom resources.

## 2.2 Lesson Study

Lesson Study (LS) was a professional development practice originated from Japan since Meiji period (Baba, 2007; Lewis, Perry & Murata, 2006). The term Lesson Study was translation of Japanese term *jygyou kenkyuu*, where *jygyou* means: “instruction, lessons, or lesson”; and *kenkyuu* means: “research or study” (Lewis, 2000, p.3). A LS group is formed by a group of teachers to study their own lesson collaboratively (Baba, 2007; Fernandez, 2002; Lewis at al., 2006). Sometime, the LS group may invite knowledgeable others for example, expert teacher from other school or educator from university to join them for discussion, observation and reflection (Fernandez, 2002; Lewis & Tsuchida, 1998). A lesson which is collaboratively planned, conducted, observed and reflected by the LS group known as research lesson (Lewis, 2000). Research lesson is actual lesson that conducted in a real classroom situation (Lewis, 2000). Through observation of real happening lesson, this provides the teachers opportunities to observe the effect of pedagogical practices towards the pupils’ learning (Chiew & Lim, 2005). Hence, as suggested by Lewis at al. (2012) LS is one of the programmes that can provide three types of support need for improving teaching practices: high-quality instructional

resources, practice-based professional learning and collaboration between colleagues.

## 2.3 Theoretical Framework

This study was framed by the activity theory (Engestrom, 1987), which mainly used in analysing dynamic human activity. The pedagogical flow of a mathematics lesson in a classroom could be known as a dynamic activity system. As defined in the earlier section, pedagogical flow comprised of four interrelated components: teacher, pupils, content, and classroom resources. The theoretical framework underpinned this study was shown in Figure 1. The teacher and the pupils both could be the subject in the activity system. In introducing and developing a concept, the teacher used variety tools and sign for example, teaching material, classroom resources and language to present and to represent the particular concept. Then, the teacher assigned certain tasks (object) to the pupils to be completed either individually or in groups. At the same time, the rules could be mathematical rules of the mathematical concepts involved and the classroom rules enacted by the teacher. Moreover, the community involved were the teacher-pupils interaction and the pupil-pupil interaction during the lesson. The division of labour were consisted of the teacher’s role and the pupils’ role. Hence, through this theoretical framework the analysis of the pedagogical flow of the research lesson could be done.

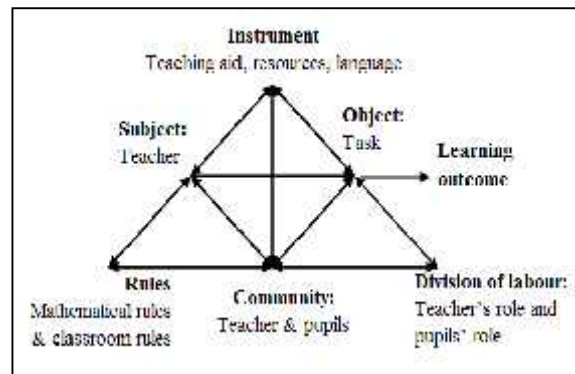


Figure 1. The theoretical framework of the study (adapted from Hardman (2007, p.66))

### 3 METHODOLOGY

#### 3.1 Participants

This study was part of a larger project which involved seven primary schools and 45 mathematics and science teachers. Seven mathematics LS groups and six science LS groups were formed corresponding to the project. Within this paper, our analysis was focused on one of the LS groups which consisted of five mathematics teachers from a Chinese primary school (school P), located in a semi-rural area of North Malaysia.

#### 3.2 Data Collection

Qualitative data were collected mainly through video recordings of the whole LS process which included the phase of: refining lesson plan, first lesson observations, first post-lesson reflection, revising lesson plan, refine lesson observation and second post-lesson reflection. Figure 2 shows the process of data collection.

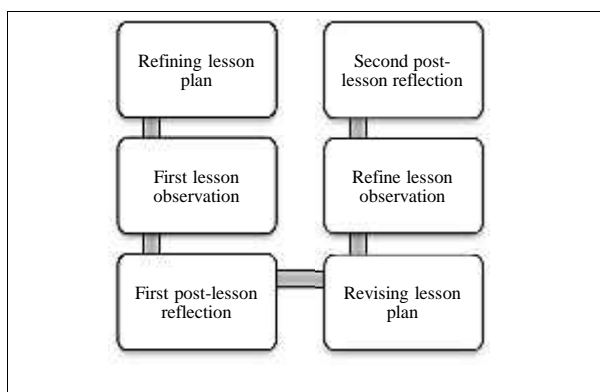


Figure 2. The process of data collection

#### 3.3 Data Analysis

In this study, the focus of our analysis was on the pedagogical flow of two video-recorded lesson observations. However, two video-recorded post-lesson reflections were supportive data for this study. The teacher’s pedagogical flow is defined to include teacher’s activities and pupils’ activities. The detailed descriptions for each coding category for teacher’s and pupils’ activities are as shown in Table 1 and Table 2 respectively.

Table 1. Coding categories in the teacher’s activities

Categories	Description
Classroom management	The teacher does managerial activities to make sure the lesson can be carried out properly. For example: to pay attention, to keep quiet.
Desk instruction	The teacher walks around to check pupils’ work or to guide pupils during individual seatwork or group discussion.
Checking answer	The teacher checks the pupil’s written answer with the class.
Explaining	The teacher explains (develops) the mathematical concepts and gives related examples.
Questioning	The teacher poses question(s) that related to the content, to the whole class or individual pupil; and pupil(s) give oral answer (s).
Revising	The teacher revises previous lesson or pupils’ prior knowledge.
Summarising the lesson	The teacher summarises the lesson of the day.
Uses of resources (blackboard/ whiteboard/ smartboard/ concrete object/ worksheet/ workbook/ textbook)	The teacher uses any tools or resources during the lesson. The resources can be resources in the classroom for example: blackboard, whiteboard and smartboard. Moreover, it can also the any teaching aids (concrete object) or task (workbook, worksheet or textbook) assigns to the pupils.

Table 2. Coding categories in the pupils’ activities

Categories	Description
Group work	The pupils work in pairs or small groups.
Individual seatwork	The teacher assigns exercise for students to try out individually in the classroom.
Presentation	The pupil(s) present their answer in front of the class after group discussion or individual seatwork.
Reading the question or answer	The pupil(s) read out word problem, question or answer during the lesson.

Table 1 indicates that teacher’s activities were categorised into eight main activities while Table 2 shows the pupils’ activities were classified into four main activities. Based on these categories, the two video-record research lessons were coded using NVivo 10, software for qualitative data analysis.

## 4 FINDINGS AND DISCUSSION

### 4.1 First Research Lesson Observation and Reflection

The lesson was aimed to develop primary five pupils' concept of volume of three dimensional (3D) solid shapes. The first teaching was conducted in a Grade 5 class which had 16 pupils. In the first episode, the teacher, Madam T began the lesson by assigning two pupils to toss a dice to decide who was going to answer the questions. The questions included: What is the name of the 3D shape? How many surface areas of a cube? Then, she presented two examples of cube (concrete object) to the class and repeated the similar questions to the whole class. Later, she posted the answer on the smartboard. This served as a revision of the pupils' previous concept on 3D shapes.

In the second episode, Madam T invited the pupils to name any daily life object that is in the shape of cube. From the hint given by her, a pupil gave the answer Rubik's cube. Then, she posted a picture of Rubik's cube on the smartboard and required the class to state how many small cubes were needed to form the Rubik's cube. Subsequently, she assigned a pupil to fill a model of Rubik's cube with small cubes (concrete object) in order to obtain the answer. Again, Madam T posted the answers on the smartboard as in Figure 3. She further posed questions to the class regarding the surface area and the formula of area as revision, and followed by the formula of volume.



Figure 3. The teacher posted the formulae for area and volume on the smartboard

In the next episode, Madam T presented to the class two cuboids of different sizes (concrete objects) and asked them to compare which one had

the greater volume. She assigned two pairs of pupils to fill the base of the two cuboid models with small cubes (concrete objects) first to find out the area of the base. Then, one representative of the pairs with the teacher's guidance presented their answer for the area of the base. Next, Madam T asked the pupils to fill in the height of the cuboid model and presented their answer. Finally, they were required to fully fill the model to obtain the volume. However, the findings show that Madam T encouraged one of the pupils to fill in only the base and the height of the cuboid and obtained the volume of the cuboid by calculation. This could be due to the constraint of lesson time. After the pupils' presentation, Madam T posted the answers on the smartboard (abstract).

In the fourth episode, Madam T gave instruction to the class to build as many models as possible with the volume of  $60\text{cm}^3$  (concrete objects) by using the small cubes given to them in pairs. Then, they were required to write the multiplication of the volume involved (abstract). She explained to the class how to build the model by presenting the examples of cue and cuboid (concrete object) at the same time posing questions to the whole class to confirm that they understood her instruction.

Madam T then distributed 100 pieces of small cubes to each of the pair. She conducted desk instruction-walked from pairs to pairs to guide the pupils and to check their model. The pupils were actively engaged in the activity as in Figure 4.



Figure 4. The pupils built the model in pairs

In the sixth episode, most of the pupils were able to work in pairs to build at least two models with teacher's guidance for the first model built. Madam T posted the possible combinations of multiplication that could be obtained by the pupils on the smartboard. She illustrated two examples of the models built by pupils on the blackboard as in

Figure 5. While illustrated the examples, the teacher posed questions to the whole class and the pupils responded.

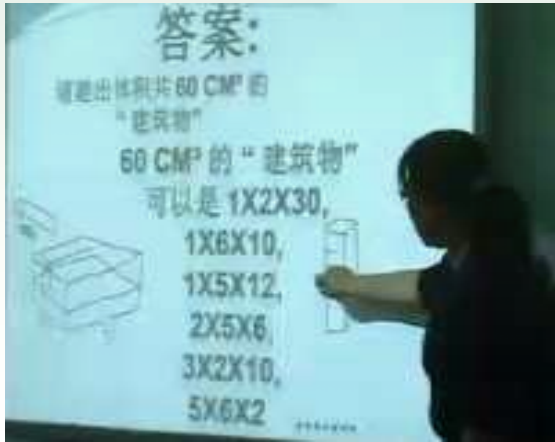


Figure 5. The teacher posted the possible equations and illustrated examples

In the seventh episode, Madam T told the class that volume was the space occupied by an object and volume was not area as summary of the lesson. She assigned individual seatwork to the class. The pupils were required to complete a worksheet by themselves in the class. The teacher conducted desk instruction while the pupils were in seatwork.

Next, Madam T posted a photo of the model built by a pair of pupils. She then posed questions to the whole class and the pupils responded. The questions included: “Who built this model?” and “What is the multiplication of the volume involved?”. The teacher further posted another four photos and posed the similar questions to the whole class and the pupils responded. Then, she assigned two pupils to come to the front to present their model one after another. The teacher guided their presentation by posing questions about the multiplication of the volume to and the pupil responded.

In the last episode, the pupils continued with individual seatwork while Madam T conducted desk instruction to check the pupils’ work. She then ended her lesson by asking the class to complete the worksheet at home.

A post-lesson reflection was conducted within the LS members and researchers after the lesson observation. Through the reflection session, two of the LS members found that the first episode involved only two pupils and the third episode involved two pairs of pupils as in the following transcript. They suggested that the activities shall involve more pupils or the whole class:

Mr. Y: [The activity] involved only two pupils to fill in [the small cubes] one after another. [We] can involve more pupils.

Madam M: Me too found that [the activity] involved the particular pairs of pupils, the rest of them did not have [the chance] to try.

Besides that, another two LS member found that many of the pupils could not understand the concept of volume. This could be observed from hands-on activity whereby the pupils needed the teacher’s guidance and took longer time to build their first model. They mentioned that this might due to the fact that the teacher did not fully emphasise on the concept of volume. Furthermore, Madam T herself realised that the flow of the lesson was too rush as she mentioned during the reflection, “[I was] going too fast”. Thus, they suggested there is a need to keep revising a few times the concept of volume before the hands-on activity.

#### 4.2 Refine Research Lesson Observation and Reflection

The refine lesson was conducted in another Grade 5 class which had 17 pupils in the following year. In the first episode, the lesson began by the teacher, Madam T posed questions to the class and individual pupils responded. The questions posed mainly about their experience of moving from the old school building to the new school building. The shape and space of the school building had changed. Then, she posted pictures of different types of buildings to the class by using a smartboard as in Figure 6. Meanwhile, she posed questions regarding the shape of the building to the whole class and the pupils responded.



Figure 6. The teacher posted pictures of different types of buildings.

Then, the teacher asked the whole class to name the 2D shapes that they had learnt before. This

served as a revision of the pupils’ prior knowledge about the 2D shape. She presented a Rubik’s cube and a tissue box to the class. Meanwhile, she posed questions to the class about the shape of the two objects and the pupils responded.

In the third episode, Madam T divided the pupils into four groups with four to five pupils in a group. The pupils were required to complete the task in group to find out: the number of sides, the number of surfaces, length, width and height of the two concrete objects (Rubik’s cubes and tissue box). Madam T conducted desk instruction to check the pupils’ work and guided the pupils. Most of the pupils engaged actively in the group work as in Figure 7, whereby they took turn to complete the task. For example, counted the number of sides, surfaces and measured the length, width and height of the objects.



Figure 9. The pupils work in groups

Next, one representative from each group came to the front and presented the card written with the answers to the class. Madam T checked the written answers with the class by posing questions to the class or individual pupil. At the same time, she used the Rubik’s cubes and tissue box when checking the answer and the pupil(s) responded. Besides, she used the tissue box to explain that the length of a cuboid was depended on the position of the cuboid. From the card presented by the pupils, all the four groups were able to obtain the correct answers.

In the following episode, in order to find out the volume of the Rubik’s cube (concrete object), Madam T assigned the pupils in pairs to dismantle the Rubik’s cube layer by layer. She conducted desk instruction while the pupils dismantled the Rubik’s cube to guide the pupils.

Then, the teacher checked the answer of the number of units in first layer with the class by posing questions to the class. She invited four individual pupils to give their answer and she posted the answer on the smartboard for the first layer. The

process of the pairs dismantling the Rubik’s cube, the teacher posing questions and posting answer on the smartboard was repeated for the second layer and third layer and the total volume of Rubik’s cube.

In the seventh episode, Madam T revised the formulae of area and volume by using the example of the Rubik’s cube. She presented the Rubik’s cube (concrete object), at the same time posted the formulae of area and volume and the picture of Rubik’s cube on the smartboard (see Figure 8) to emphasise the concept of volume.

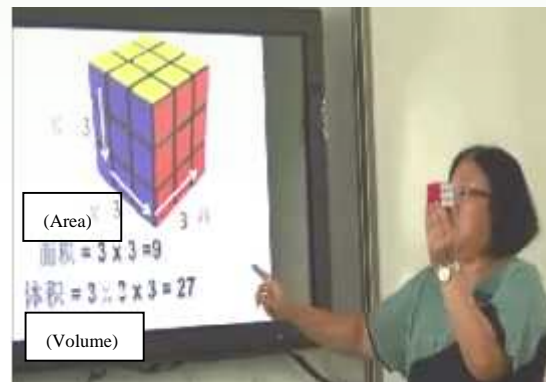


Figure 8. The teacher posted the formulae of area and volume at the same time presented the Rubik’s cube to the class

In the next episode, Madam T distributed a box of small cubes to each of the pair. She explained how to build a model by using the small cubes started from the base and followed by the height. Then, she tried to emphasise that one small cube was equal to one cubic centimetre ( $\text{cm}^3$ ) twice orally to the pupils. She emphasised again how to build the model and let the pupils worked in pairs.

Later on, from the observation the pupils were actively engaged in building the model in pairs (see Figure 9). Madam T conducted desk instruction to check the pupils’ work and to guide the pupils. During desk instruction, she kept reminding the class for a few times to build the model started from the base and followed by the height.

In the tenth episode, Madam T assigned a pupil to present their completed model in front of the class. Madam T guided the pupil’s presentation by posing questions to her and she responded. Through the presentation, the teacher tried to emphasise that the unit of first layer and the whole volume were  $\text{cm}^3$ . The teacher then assigned another representative for the guided presentation.



Figure 9. Pupils tried to build the model (building) in pairs

After the guided presentation, Madam T tried to emphasise the unit of volume with three pairs of pupils during desk instruction. At the end of the model building session, most the pupils were able to build at least one model and wrote the multiplication involved.

In the final episode, Madam T distributed worksheets to the class as individual seatwork. The pupils were required to complete the worksheet from section A to G individually in the class. The teacher conducted desk instruction to check the pupils' work and to guide the pupils. At the end of the session, she assigned a pupil to come to the front to explain why he had chosen the particular answer for section G. She guided the pupil by posing questions to him and he answered. Then, Madam T gave instruction to the class to complete the worksheet at home and she ended the lesson.

Second post-lesson reflection was conducted right after the refine lesson observation. Madam T herself found that the emphasis on the concept of volume still insufficient. During the reflection, she said, *“They still cannot get the concept one unit is one cubic centimetre. I did not emphasise, I did not emphasise [the concept]”*. Besides, she found that filled in a box with small cubes could be a better choice of concrete object than dismantled the Rubik's cube. However, due to some technical problems, she was not able to get the teaching material that she wanted to use.

The refine lesson consisted of more pupils' involvement with one session of group works and two sessions of pairs work. One of the members commented that too many pupils' activities conducted. Yet another LS member said through the first group work session, they identified that the pupils' prior knowledge on width and length and the number of sides was weak.

In addition, two of the LS members found that some of the pupils still did not fully understand the concept of volume. In the second pairs work session, most of the pupils build their first model with the teacher's guidance. A LS member suggested the teacher could have guided the whole class in the beginning of the activity before she let them to build the model by themselves.

Hence, the findings above show that through active discussion in the first post-lesson reflection, the LS group had refined the lesson. The comparison of the pedagogical flow of the first research lesson and the refine research lesson was as shown in Figure 10. In the first lesson, the teacher had a short revision by posing questions about the 3D shapes to individual pupil and the whole class. Then, she tried to concretise the concept by using the Rubik's cube and two transparent cuboids of different sizes. However, the activity of filled in the space of concrete objects involved only a few pupils. The teacher posted the formulae of area and volume on the smartboard (abstract) each time after filled in the concrete object with small cubes. Through the pairs work session of building the model, the LS group found that pupils still cannot understand that volume is the amount of space in a 3D object.

Nevertheless, in the refine lesson the teacher began the lesson by posing questions related to pupils' daily life experiences about moving from old school building to new school building. She had spent longer time in revision of 2D shapes and 3D shapes by posing questions related to the shape of different types of building and a group work session. She then assigned pairs work to the class to dismantle the Rubik's cube (concrete object) in order to identify the volume of the Rubik's cube. This served as development of the concept of volume. She posted the formulae of area and volume on the smartboard (abstract) and spent longer time in explanation. In addition, the teacher repeatedly explained how to build a model by using the small cubes before the group work session. However, the dismantling of the Rubik's cube and longer time spent in explanation still failed to bring out the idea of volume as the amount of space occupied in a cube.

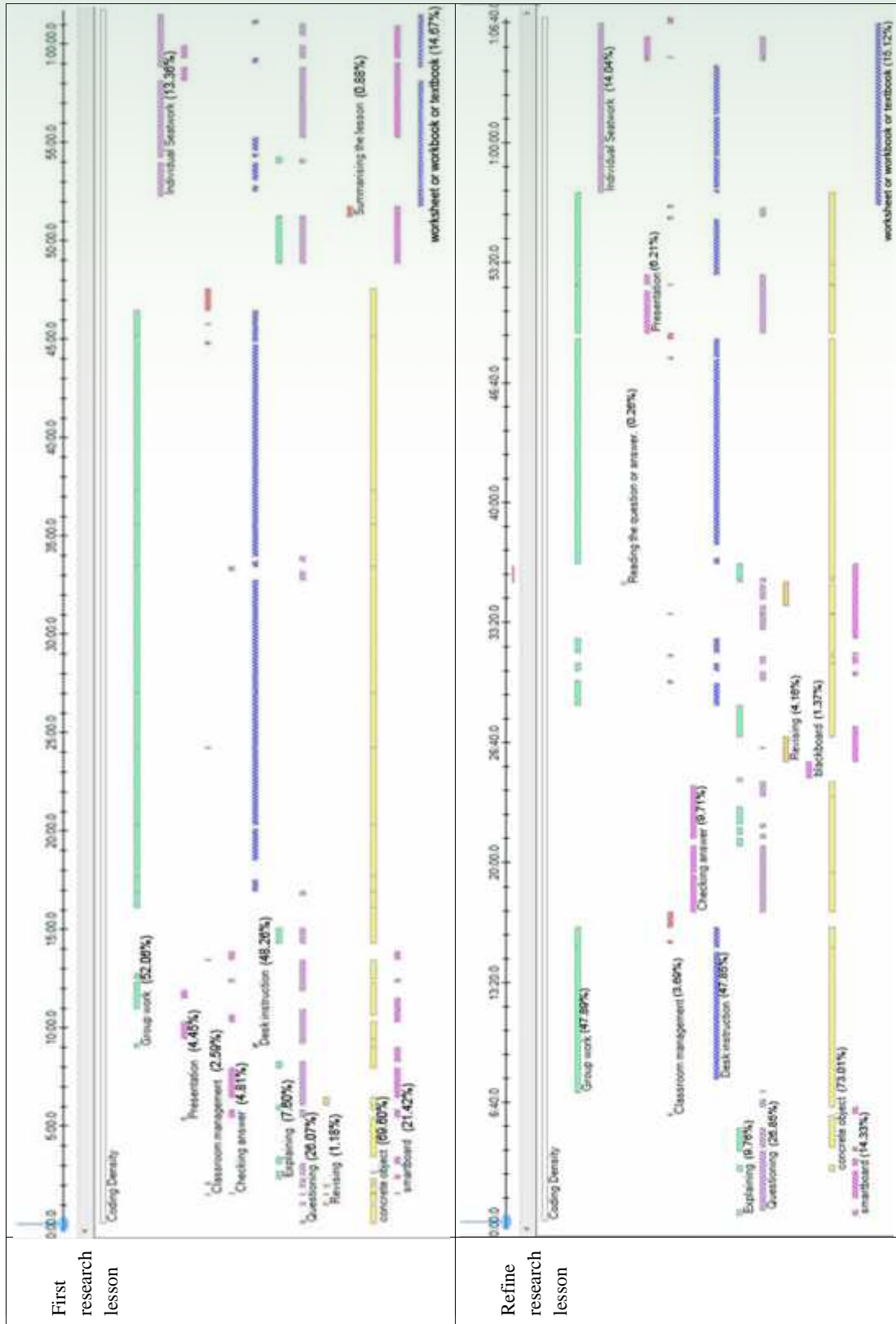


Figure 10. The pedagogical flow of the first lesson and refine lesson in school P



## 5 CONCLUSIONS

In brief, through analysis of the first lesson observation revealed that the research lesson was a challenging lesson. The teacher attempted to develop pupils' understanding of an abstract concept such as volume. Through observed the teaching and learning process, focused on pupils' learning and understanding and teachers' reflection, the refine research lesson taking care of the weakness, ambiguity, and even the use of concrete object. For examples, gave daily life examples orally and graphic, revision of the pupils' prior knowledge on 2D and 3D shapes, increased the pupils' engagement in the activities and more types of concrete objects used during the lesson. All these changes had make the refine lesson became more effective. Yet, in the LS members' opinion, the refine lesson was still not a perfect lesson for them.

Furthermore, the evolution of the mathematics lesson was explicitly connected to the result of discussion and reflection in the LS process. A good lesson really takes time to refine. Anyhow, the LS process provides a platform for the teachers to discuss, to observe a real happening lesson (what they plan), to realise what the problem that they face during the real lesson, to aware of the pupils' learning abilities, to magnify the proper use of classroom resources, and to reflect their own teaching practices. The results of this study show that the process had provided not only reflective teaching, but also peer support for these teachers to explore new teaching approaches, and enhance their own conceptual understanding.

## 6 ACKNOWLEDGEMENTS

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## Effectiveness of lesson study to improve the quality of teaching in Bangladesh

### *The analysis focuses on changes of the lesson*

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**Abstract:** This paper aims at clarifying the current status and issues of lesson study being implemented recently in Bangladesh. The lesson study has been introduced under the PEDP (Primary Education Development Program), in order to improve the quality of lessons and teachers' competence. The training for the lesson study was conducted for this introduction, and some model schools and public primary schools have already started it. However, there is no system in place to ensure its quality, and besides there is no data available to confirm its quality. Despite all the efforts, effects of the lesson study, that is the improvement of the quality of the lesson, are not known. The promoting and inhibiting factors to this situation are not certain. In this paper, the case of the lesson study in the experimental school attached to Primary Teacher Training Institute in Rajshahi, Bangladesh, which has been regarded as a model case, is taken up. More specifically a thorough participatory observation of lesson study for about half a year was conducted, and their activities were analyzed. The analysis focuses on changes of the lesson, especially children's activity and teacher's role during the lesson, between the beginning and the end of this period. In addition, the factors for changes or no-changes with a focus not only on the lesson but also on the subject knowledge, skills and belief of teachers were analyzed, with particular consideration to the issues pertaining to this early stage of implementing lesson study and the formation of professional community.

**Keywords:** Bangladesh, participatory observation, effects of the lesson study, daily lessons

## 1 INTRODUCTION

In recent years, lesson study has been introduced in Bangladesh in order to improve the quality of lessons and teachers' competence. It has already started in some model schools and public primary schools. Until now, it has been promoted as a policy for the quantitative expansion of lesson study. However, there is no system in place to ensure its quality, and

besides there is no available data to confirm its quality, that is improvement of the quality of lessons and teachers' competence. Therefore actually the effects of lesson study are not certified.

How lesson study is practiced in various regions is an important indicator as the purpose of lesson study that is the improvement of the quality of lessons and teachers' competence. At some schools, it is recognized as an effect of lesson study that the

quality of lessons, teachers’ competence and school environment has been improved continuously. On the other hand, at many other schools practicing lesson study becomes the purpose itself or concerned teachers just implement it mandatorily, because of the lack of recognition of the effect of lesson study. In those schools, lesson study may not sustain.

To solve this problem, it is necessary to improve the quality of lesson study by analyzing the impact on quality of lessons and clarifying the promoting and inhibiting factors at the lesson study. The quality of lesson study is measured by how it contributed to the improvement of quality of lesson or teachers’ competence. The higher quality of lesson study is expected to make the concerned personnel feel the improvement of teaching. It would also motivate them engaged in lesson study, resulting in the larger positive impacts.

Lesson study is still in infancy in Bangladesh. It is necessary to organize the effects and issues of lesson study, and to analyze the factors, because now lesson study is recognized all over the nation and its difference on the status of implementation in each school started to appear. It will contribute to expand lesson study in effective manner and improve the quality of lessons and teachers’ competence as the ultimate goal of lesson study.

In this paper, we take up the lesson study in an experimental school which is attached to Primary Teacher Training Institute (PTI) in Rajshahi, Bangladesh, as a model case. We analyze that effectiveness of lesson study to improve the quality of lessons and teachers’ competence, what are the inhibiting factors if lesson study has not been able to improve them.

## **2 THE CURRENT STATUS AND ISSUES OF EDUCATION IN BANGLADESH**

Although the net enrollment rate of primary school is more than 90% in Bangladesh, graduation rate is still low; it remains in about 60%. It is considered that low graduation rate of elementary school in Bangladesh is significantly related to the quality of lessons. In fact, Bangladesh government has implemented various policies improve the quality of teaching, increasing the graduation rate. However, the following problems remain unsolved about the quality of lessons in Bangladesh.

### **2.1 Insufficiency of teachers and classrooms**

There are issues of quantity which have to be discussed before focusing on issue of quality of lessons in Bangladesh. One is a chronic insufficiency of teachers and classrooms in many schools. The other is the lack of teachers’ actual head-count in schools caused by their leaving to get training. In order to cope with such situation, many schools adopt two-parts system, resulting in another problem of insufficiency of the number of classes.

### **2.2 Insufficient subject knowledge and pedagogy knowledge by unlicensed teachers**

Since license is not required to be obtained to become a teacher in Bangladesh, a large number of teachers in Bangladesh are not equipped with neither sufficient subject knowledge nor sufficient pedagogy knowledge. In order to ensure above competence, a training of a year and half is mandatory for the teachers after getting enrolled as a teacher. Despite the opportunity of learning, consciousness of learners

tends to be low because of its mandatory manner, and then, the effect of leaning opportunity is not sufficiently realized.

### **2.3 No experience of child-centered teaching**

It is said that teachers' attitude and values for the lesson is based on their individual experience in lessons on childhood. However, currently many teachers in Bangladesh, who teach in front of students, have never taken the lessons in child-centered approach. Therefore, even they receive training about child-centered teaching, it is difficult to apply child-centered teaching appropriately to their daily lessons.

### **2.4 Luck of teachers' professionalism caused by working environment and social status**

Insufficient working environment and teachers' social status also effect on the quality of teachers, resulting in weak professionalism as a teacher. Therefore, their willingness to improve the quality of their lessons is also weak. Even taking a lot of training, teachers often neglect to pay efforts to prepare for daily lessons on the excuse of no time or insufficient environment in school.

### **2.5 Relationships with colleagues and mismatch of majors**

There are the management system of seniority and top-down at schools in Bangladesh. Actually, such a top-down structure is effective as quickly and reliable way. But on the other hand, adverse effect is also occurred on the formation of individual sense of purpose for improvement of daily lessons. In addition, subject teacher system is adopted, expertise of teachers greatly affects their subject knowledge.

However, many teachers often are in charge of a different subject from their expert, and then it is a factor of reducing motivation and quality for the subject which is not their major.

It is necessary to solve these problems for improvement the quality of lessons. Therefore various approaches have been taken in Bangladesh. For example, there are various training for teachers. But participation to training becomes the purpose in itself because training is required, and it is posed new issue that the learning effect is reduced. Another example, the guidebook, where specific teaching plan and materials in math and science subjects are described, has been distributed to elementary schools nationwide for the dissemination of child-centered teaching. However we can see few teachers using this guidebook on a daily basis. This can be considered as a factor that consciousness of trying to improve lessons is low.

In other words, it is one of the crucial points for the improvement of the quality of teachers and lessons that teachers improve their professionalism and proactively work on improvement of lessons in the current environment. Not only technical issues such as subject knowledge and teaching methods, but mental issues such as teacher's practice and motivation are also needed to be solved. And it is lesson study introduced in Bangladesh in recent years that respond to the issues.

## **3 LESSON STUDY INTRODUCED IN BANGLADESH**

Lesson study has been introduced in earnest in Bangladesh from around 2011. It has mainly been introduced at experimental schools attached to PTI and model schools. Currently, training for not only elementary school teachers but principals and PTI or

URC (Upazila Resource Center) instructors has also been implemented, the method is spreading across the country.

In this section, we confirm its background, method and current state about the lesson study introduced in Bangladesh

### 3.1 Background

Lesson study has been introduced in Bangladesh with the goal to ensure better teaching and learning through developing teachers professionally.

Education of Bangladesh is facing some issues, such as low achievement in quality education, high dropout rate, absenteeism, inefficient teaching and learning in the classroom, improper assessment system, extreme centralized administration etc. In order to solve these issues, lots of approaches have been taken, with focusing on realization of high quality education. And this is grounded in the following idea. That is, high quality of teacher is the pre-condition of ensuring high quality teaching to the students. And for ensuring quality teacher, teacher education is an important area.

Bangladesh government at present has given emphasis on continuous professional development of teachers. Lesson study is a process in which teachers can be engaged to learn more about effective practices that should result in improvement on learning of the students in future. Through lesson study, teachers can reflect on their prepared lesson plan and conducted classes and collaborate or share ideas with colleagues for improvement of teaching and learning. In Bangladesh, teachers are still not familiar with like them. In this regard, lesson study practice should contribute a lot to change teachers' consciousness or attitude.

Lesson study has been considered to be an

appropriate approach in Bangladesh in terms that primary school teachers can practice to develop themselves professionally and continuously.

As the purpose like the above, lesson study has been introduced since several years in Bangladesh, and now, it is implemented in a lot of elementary schools.

### 3.2 Method

Lesson study in Bangladesh is constructed in accordance with the concept that aims the sustainable and voluntary improvement of teachers through the Quality Teaching Cycle (QTC) which consists three cycles (1)Plan, (2)Do, (3)See.

One teacher creates the lesson plan, and discuss on the base of it with colleagues in “Plan”. They implement and observe the lesson which is based on the discussed lesson plan in “Do”. They make feedback the lesson in order to improve the lesson in “See”. By repeating these three processes, it is aimed to sustainable development of teachers' professionalism.

Lesson study, which is generally implemented in Bangladesh, is not to be set its theme and issues at first in one. They mention the good points and improvements with focusing on the lesson of the teacher, and discuss what other methods can be considered, and how they can make a better lesson.

And also in Bangladesh, there are instructors of PTI or URC as persons who promote the lesson study in accordance with the government's education policy. They are in a position to carry out the training for the teachers, coordinate the lesson study in own initiative. These instructors have much knowledge than the general teachers and are in a different position. Their participation in the lesson study contribute to make sense of unity in the area beyond the framework of the school and to deepen of the

discussion in lesson study. However, if their authority becomes too large, it can be occurred that the most important element such as autonomy and collaboration between colleagues would be not function well.

### 3.3 Current state

Lesson study introduced in Bangladesh in the above background and method, is currently being spread through PEDP3 (scheduled to end in 2012 - 2017).

There are several elementary schools which realize the improvement of the quality of lessons and teachers' competence as effects of lesson study, and are continuing to actively practice. On the other hand, there are not few schools where lesson study itself becomes a goal and mere facade, or it has taken just a few times but not is continued due to not realizing its results and effect.

It has been released from just novelty or interest to the lesson study by increasing training and schools implementation. Therefore lesson study introduced in Bangladesh is faced a new phase. It advances to a next step, which continuous implementation of lesson study and improvement of quality of lessons and teachers' competence, from previous step that aims just implementation.

In the next section, we clarify the migration factors to each stage and each issues of implementation status in lesson study. Then, we show the position of the experimental school attached to PTI in Rajshahi as a model case in Bangladesh. We clarify common issues which lesson study is currently facing in Bangladesh.

## 4 THE POSITION OF THE EXPERIMENTAL SCHOOL ATTACHED TO PTI IN RAJSHAHI IN LESSON STUDY OF BANGLADESH

It has been several years since lesson study has been introduced in Bangladesh. The difference on the implementation status of each elementary school can be seen little by little. At the same time, the issues are seen in each school. In order to organize these issues, we classified the implementation of lesson study in Bangladesh into four stages. Then, we will clarify the factors or issues in each stage to proceed to the next stage.

### 4.1 Stage1: They do not implement lesson study

Stage1 is that they do not implement the lesson study. It means schools which are not currently carried out lesson study. It is not only schools that have never implement it because they do not know itself or doing method or no opportunity to lesson study, but also schools that are not subsequently carried out because they could not get the effects and significance even they tried once before.

In order to advance to stage2 from stage1, it is necessary that Recognition and understanding for the lesson study and opportunities and environment to implement.

### 4.2 Stage2: They implement obligatorily lesson study

Stage2 is that they implement obligatorily the lesson study. It means schools which carry out it continuously or intermittently by external motivation. It can be seen a lots in model schools and

experimental schools attached to PTI where the top instruct to do it or submit report. Although they are continuing implementation, the participants often have not got the effects or significance yet and have conducted reluctantly lesson study.

In order to advance to stage3 from stage2, it is necessary to change the teachers' awareness for lesson study and daily lessons.

#### **4.3 Stage3: They implement voluntarily lesson study**

Stage3 is that they implement voluntarily the lesson study. It means schools in which participants get the significance and work actively to lesson study by internal motivation. On the other hand, there are not few schools in which participants feel forward and sense of achievement from implementation of lesson study itself. In this case, although voluntary continued, there is a high possibility that the improvement of lessons is not accompanied.

To stage4 from stage3, it is necessary to change the teachers' behavior for lessons and improve teaching skills and knowledge through lesson study.

#### **4.4 Stage4: Their quality of lesson is improved**

Stage4 is that their quality of lesson is improved. It means school in which lesson study affect on not only a change participants' awareness for lessons, also the teachers' competence, as a result, it can be confirmed that improvement of the quality of lessons and teachers. In this stage, through involving the changes of teachers' awareness and the changes of quality of lessons with each other, it can be said that lesson study contributes to the sustainable improvement of the quality of lessons.

It is the most important and most difficult issue to migrate to stage4 from stage3. Because the ultimate goal of lesson study is the improvement of the quality of lessons, but it is difficult that lesson study contribute directly to the goal under educational background and ability of teachers in Bangladesh.

In the above process of improvement of lessons through the lesson study, we have written that the change in the quality of lessons comes after the change of teachers' awareness. But they are synergetic exchanges each other in lesson study. While the change of awareness affects the improvement of teaching skills, teachers' awareness and activeness also improve through recognizing the improvement of their own teaching skills.

However, lesson study, which is implemented currently depending on the situation of each school in Bangladesh, hardly leads to improve the quality of actual lessons, in spite of giving certainly effect to the change awareness of the participants. In the experimental school attached to PTI in Rajshahi, the effect that teachers have realized is limiting about improvement the quality of lessons yet.

It is necessary to improve the quality of lesson study in order to break the current situation. We have to clarify what lesson study affects teachers and lessons, the factor of this change is, or factor of still unchanged aspects is. We explore issues and possibilities of lesson study in Bangladesh through analysis on their activity at the experimental school attached to PTI in Rajshahi.

This is an important proposition for all other stage. The inhibition factor to implement lesson study is that they cannot find the sufficient effect more than its cost. And it is caused by that the way is not shown enough to the improvement of the quality of lessons as the goal of lesson study. It is necessary to show

properly how lesson study affect the quality of lessons and what factors are required for it, in order to encourage more schools which are still on the stage1 or 2 to implement lesson study.

For further development of lesson study, it's being required to promote the improvement of the quality of lessons through it. It has finished the stage to just implement. As a result of this, we will get the possibility of lesson study that is really appropriate and necessary for this country.

## **5 LESSON STUDY AT THE EXPERIMENTAL SCHOOL ATTACHED TO PTI IN RAJSHANI-THE ENVIROMENT AND METHODS**

### **5.1 Environment**

PTI assumes a role as center of education in the province in order to ensure teachers' competence. As the main work, the trainings are conducted of one year (gradual migration to year and a half from 2013) for unlicensed teachers and also of subject content and curriculum for teachers.

Experimental schools are attached in all of the PTI and used to acceptance of teaching practice, observation for lessons and so on.

In the experimental school attached to PTI in Rajshahi, five teachers take charge of about two hundred children on 1<sup>st</sup>-5<sup>th</sup> Grades, and run the school under subject teacher system. There is no difference between the experimental schools and general elementary schools in aspect of qualities of the school environment and teachers.

In PTI Rajshahi, number of instructors is large, and also three people have received training about lesson study in Japan. In other words, it can be said

that there are relatively many resource persons who understand well about the lesson study in PTI Rajshahi. And in the Future, it would increase number of such resource persons who receive training in overseas to Lesson Study in PTIs across the country.

The positions of the instructors and the experimental school teachers, who participate in the lesson study in PTI, are not equivalent. Because instructors are usually in a position to carry out the training for teachers, and the experimental school teachers are also receive the training. So here, the hierarchical relation between them is established.

Lesson study in the experimental school attached to PTI in Rajshahi has been carried out in two subjects that are science and math. The following two teachers are mainly in charge of the subjects.

One teacher is in charge of mathematic. He has teaching experience for 12 years including at a general elementary school. His charged subject almost matches with her major, and it can be said that his subject knowledge is relatively high. Another teacher is in charge of science. He has experience for 5 years at this experimental school. He is also in charge of English, the knowledge and awareness for science is relatively low.

In this paper, we analyze by focusing on not only the lessons but also the subject knowledge, skills and behavior of two teachers at observation of Lesson Study in the experimental school.

In the next subsection, we mention method of the lesson study carried out at the experimental school attached to PTI in Rajshahi.



## 5.2 Method

### 5.2.1 Determination of the date

It is aimed at implementing once a month. Implementation date is discussed and determined by instructors and experimental school teachers after finishing the last of lesson study.

### 5.2.2 Decision to teachers and lesson's unit of implementation

It is implemented on the two subjects: mathematics and science. The teachers, who are in charge of these subjects, are often chosen as practitioner. Grades and lesson's unit at lesson study is determined in view of the progress status of the curriculum by the practitioner.

### 5.2.3 Preparation of the lesson plans

The practitioner prepares the lesson plan by himself with referring to the guidebook. The PTI instructor who is in charge of such subject advices, and they improve it toward lesson plans meeting.

### 5.2.4 Lesson plans meeting (Plan)

It is carried out about one week before implementation date of the lesson. Participation in it is not particularly required, so only persons who are interested in it participate.

In the meeting, the practitioner read the lesson plans first, and then participants say their opinions in order. It takes thirty minutes to discuss each subject. Many specific advices about the activities and processes of lessons come up from them. And then, the lesson plans is improved by using those opinions as a reference.

### 5.2.5 Improvement of the lesson plans

Based on the opinions in the lesson plans meeting, practitioners improve the lesson plans again and prepare the materials as needed.

### 5.2.6 Observation and implementation of lesson (Do)

The practitioners make the lesson based on lesson plans, and others observe. They observe and take notes on their own while. They don't intervene in the lesson as a rule. Photos and video are taken here for record, not used in review meeting after lessons.

### 5.2.7 Review meeting after the lesson (See)

The review meeting is immediately carried out after the lessons.

The practitioners deliver feedback about the lesson first, and then the observers express the opinions that are improvements and good points one by one. It takes forty minutes to discuss.

In PTI in Rajshahi, the lesson study has been started continuous implementation from March 2014 and till now. It been implemented five times on the subjects of science and mathematics.

In the next section, we analyze the factors of the changes or no-changes about teachers and lessons through participatory observation of this five lesson studies and daily lessons for about a half year.

## 6 THE CHANGES OR NO-CHANGES AND ITS FACTORS THROUGH THE LESSON STUDY

The purpose of lesson study is improvement of the quality of lessons. We divided into four perspectives to analyze the changes and no-changes and its factors

of lesson study, daily lessons focused on children's activities, and teachers' behavior at the meeting about lessons.

In terms of the changes in the quality of lessons through the lesson study, it undergoes a process of that firstly quality of lessons and teachers changes in some way in the lesson study. Then, these changes affect the daily lessons. Thereafter, three types of case can be appeared. First one is the changes in lesson study will be the changes in daily lesson. Second is, the changes in lesson study will not be change in the daily lesson. And third is, no-changes in the lesson study will be no-change in the daily lessons. It is the following the table1 that summarizes it.

Table 1. The changes or no-changes in lesson study and daily lessons.

1. The changes in lesson study.
2. The changes in daily lesson same as in lesson study.
3. The no-change in daily lessons against change in lesson study.
- 4 The no-change in lesson study nor daily lessons.

Field	Changes or no-changes	
lesson study	1, changes	
Daily lessons	2, changes	3, no-changes
	4, no-chages	

We analyzed the effect of lesson study through the four perspectives. And we clarified the factors of the changes or no-changes.

Table 2. Time of children's activity in the lessons of lesson study

It is the time excepting teachers' explanation such as

manipulation the materials or solving problems.

	Mathematics	Science
First time	15 minutes	12 minutes
Second time	11 minutes	No implementation
Third time	17 minutes	15 minutes
Fourth time	18 minutes	11 minutes
Fifth time	21 minutes	19 minutes

Table 3. The teaching materials used in the lessons of lesson study

	Mathematics	Science
First time	ICT, Poster paper	Glass, ice, water
Second time	Poster paper	No implementation
Third time	sticks, poster paper	photographs, pictures coping textbook
Fourth time	Clock, scissors, Papers, poster paper,	Water, bucket, scrap of paper, fan, glass
Fifth time	Rulers, picture coping textbook, pens, candles, majors	Candles, picture coping textbook, water, matches, papers

Table 4. The contents of teacher's questions in the lessons conducted in lesson study (In March and August, Mathematics)

1<sup>st</sup> topic: subtraction, in March  
 First let's read this table together.  
 Today we will study the subtraction of 5digit - 5digits.

"82425-57236" we will solve this problem in the calculation by writing.

When the number of lower is larger than the number of the above, how would you calculate?

What is the result of calculate "15-6"?

What is ten's digit then?

Do you need to rent a number from the place of 1000 in place of the 100? Why?

Can you solve this problem? Let's solve.

What do you say each of the numbers?

Which is the largest numbers in these three numbers?

Subtracting subtrahend from minuend, what comes out?

If the number of minuend is blank, how do you calculate the number?

Now, let's solve this problem.

How did you calculate the number of minuend?

Then, if the number of subtrahend is blank, how do you calculate the number?

Make into groups, solve these problems.

How did you calculate these problems?

What's the blank in this issue?

Finally, please solve these problems.

3<sup>rd</sup> topic: multiplication, in August

How many people are there sitting in one of the bench now?

There are three benches in a group, How many people in total?

How did you count it?

Then how many people in five benches?

How did you count it?

Counting one by one or going plus one by tree, Which is better?

There is a way to simplify that adding the same number.

What is it?

Which is better it or addition?

When you simplify this calculation  $(3 + 3 + 3 + 3 + 3)$ ,

how can you write?

In this calculation, how many "3" are there?

Then, how can you write as multiplication

When addition of lot of the same numbers, How do you have to calculate?

How many dealt stick? Calculate it.

There were five bundles of three stick. Which number to multiply is?

In the picture of textbook, how do you write the formula?

How many sticks are there on the dish in the picture? How many these dishes?

What does this picture show you?

How many apples?

How many?

How do you write a formula?

Please solve the exercises.

Table 5. The opinions at review meeting after the lesson in lesson study (in March and August, Mathematics)

1<sup>st</sup> topic: subtraction, in March

A: The introduction was interesting, so children were concentrated.

Although the goal of lesson has been achieved, the time was not enough. So he should give the homework. It was extended 15 minutes.

B: By group work, children were able to participate in the lesson.

It was good to use teaching materials such as ICT and poster paper. However, it was better if there are more.

Children have understood well, it is better to secure the more time for question as evaluation.

C: At group work, it was good that children have discussion.

Such as ICT and poster paper, it was good that there was a lot of teaching materials.

Teacher praised variously, children were able to

concentrate on the lesson.

By not always standing in front but seeing back of the classroom, it is possible to determine whether the children are concentrating.

When he checked the answer of the problem, since he let the all say at once, and he did not know who was wrong.

D: Because it was too much time at the opening of the class, time of the problem as evaluation was not enough.

E: Because the teacher was in front most of the time, he should be more attention to the situation of children.

The poster paper was small, I was hard to look it from behind.

You should give the opportunity for the children to ask questions, Such as "why is this so?"

F: First, starting from 1-digit subtraction, you should gradually give more difficult problems.

You should proceed with the lesson with repeating the questions and answers.

No time for the last exercises. It is possible to know whether the children really understand it in this time.

G: You had prepared the teaching materials very well.

When you had given children questions which lead same answer, children's concentration was lost.

I think that it is the reason why there was no time for the last that introduction and group work was long.

3<sup>rd</sup> topic: multiplication, in August

A: Although he was using the actual materials, but only used once. You should use it more.

During group activities, the work has been individual activities.

You should use the semi-concrete materials after the concrete materials.

B: It was good to confirm the existing knowledge first.

You should use more various concrete materials, not

only use bench in the introduction.

In the introduction teacher was talking most of time. It is better to increase more children activities.

Not only the stick, but it was needed a lot of teaching materials.

There were no semi-concrete materials.

You should give more various numbers for multiplication.

Way of saying for multiplication was incorrect.

C: You should present not only correct way such as  $3 + 3 + 3$ , but also wrong way such as  $3 + 4 + 5$ .

You have given the same problem for all groups, the method of Each Child Learning has not been introduced.

D: All of Children were not able to participate in the lesson. You should use more teaching materials.

One of the groups finished their work early, there was a time they did not have anything. You should direct more attention for them.

E: The lesson was beyond the scheduled time.

There are many problems which lead same answer, so that the opportunities for children to think were few. You should give more problems for different answers.

While the group works, you concentrated in one group, and you were not able to take attention all groups.

Way of writing figures of four was different.

F: Using a simple number, it was easy to understand.

G: Process of the lesson was little confused.

Homework has not been given, did not need it?

H: The order of the problems was good. Such as " $3 + 3 + 3$ ", " $3$  is  $3$  times" and " $3 \times 3$ "

Table 6. Result of the survey for teachers.

Question	Mathematics	Science
What is a good lesson do you think?	Lessons which give opportunity for child to think.	Lesson using materials. There are many

	Lessons which properly achieve the goal.	children's activities in the lesson. Lessons which give opportunity for child to think.
What are good points of lesson study?	The details about the lesson become clear.	The quality of lessons improves. I get much experience.
What is the hard thing in lesson study?	The time is not enough.	Preparation of teaching materials
What has changed through the lesson study?	I was able to adapt my technique in correctly lessons. I became to take lesson through various questions.	I get used to lessons doing experiment. Children's activity has increased.
What has changed on the daily lessons?	As with in Lesson Study, I was able to adapt my technique correctly to lessons.	I began to prepare for class before. I began to see the guidebook.
Are there any differences between daily lessons and lessons of lesson study?	Children and I are concentrated In Lesson Study, but in daily lessons, children do not.	In the daily lessons, there is other work and no time, so the lower quality of lessons than Lesson Study.
Are there any improvements about way of lesson study?	Particularly nothing.	Take much time to do one Lesson Study
Has subject	It is increased.	I don't know.

knowledge increased through lesson study?	But we need to study more.	
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In addition to the materials written in the above, we have also observed from diverse perspective of another Lesson Studies, daily lessons and teachers' behavior outside of lessons for half a year. So now, we describe the changes or no-changes and its factors in four aspects which have been identified from these observations.

## 6.1 The changes in lesson study

### 6.1.1 Increase of children's remarks and activity

According to table 2, we can see that children's remarks and activity has increased as compared with the early days. The teacher uses questions and conversations from the introduction, and tries to receive many comments from children. In addition, he secures the time of group work and announcement of children focusing on children's activities in the lessons. The longer time of children activities, children can participate in lessons with more interest.

In recent years in Bangladesh, the child-centered learning has been advocated, and much training has been implemented. As a result, teachers gain idea that lesson of child-centered learning is good for children. And according to responses of the survey, they also believe that it is important to provide more opportunity for children to think, that is to increase asking question and time of children's activities, in order to achieve the child-centered learning. And it is difficult issue for them how to ensure it in the actual lessons. The lessons do not proceed as expected of teachers,

because of increasing the lesson by increasing children’s activity. Actually, the previous lesson has exceeded the determined lesson time in lesson study. Through the practice of such experiences, they have become able to expect children’s response and to secure the time for children’s activities.

### **6.1.2 Enhancement of teaching materials**

The quality and quantity of teaching materials has been improved. It means in past days, teacher has just used only the textbook or poster paper transcribed from it. But now he prepares teaching materials and pictures such as stick and candle, and also the experimental tool and properly usage of it in science lessons. They can use concrete objects in introduction, then use semi-concrete objects in a lesson.

The importance of the use of teaching materials has been emphasized, as the guidebook has been distributed across the country. Therefore, teachers understand that learning effect increases by using the teaching materials. However, it is burden for them to use the teaching materials in the actual lessons, they hardly prepare and use it. Therefore, they could not realize the importance of teaching materials, and could not understand how can take advantage of it.

They actually take advantage of it in lesson study, and understand more deeply about the importance of teaching materials or how to use them. As a result, they more often and more effectively use teaching materials.

### **6.1.3 Increase of preparation time for lessons**

The teachers have become to take more time to prepare for the lesson in lesson study. The good lesson is not made by just taking long time. But, they

take time to prepare lessons, in order to improve the quality of lesson and use many materials. In the survey, they said that no time for preparation. By accumulating the created materials or repeating practice, teachers will be able to prepare more effectively in shorter time, and it will be further improvement of quality.

Factors of the change their behavior include following, first, their awareness of trying to make good lesson increase each time of lesson study. And they feel that preparation is needed to realize good one from their own experience. As a result, the change in commitment for their lesson has appeared to increase by time.

### **6.1.4 Diversity of participants’ remarks in lesson review meeting**

In the lesson review meeting of the first lesson study, there were many contents to praise the lesson, and the pointed improvements had been fixed. However, the participants’ viewpoints to observe lessons have increased, and they have become to give various opinions by continuing implementation. On the other hand, it was also observed to have decreased the proportion to point out the good points. In regard to lesson plans, the amount of information and the visibility was improved. Through these changes, they have become to expect the lesson situation and it also contributes for improvement of the quality of lessons such as the planned allocation of time or the good deployment of lesson.

Initially they had not done lively exchange of views, because such as relationships with colleagues and less opportunity to discuss with colleagues about lessons. By keeping on the practices, the viewpoint and their relationships have improved, and they have become to present the improvements from various

angles. Practitioners also came to be able to explain the intent and reason of their own lessons.

## **6.2 The changes in daily lesson same as in lesson study**

### **6.2.1 Increase of children’s remarks**

Increase of children’s remarks in lesson study can be also seen in the daily lessons. Previously, remarks of teachers, but currently lessons are progressed through teacher’s questions and children’s answers. Although children’s activities are still little, it can be seen willingness for child-centered leaning.

In case of daily lessons, it is difficult to ensure long time for children activities, because teachers must consider the curriculum and the tests. However, they are pointed out it by participants or feel the effect on their own in lesson study, they has become able to draw children’s opinions even unconsciously in daily lessons. In addition, children themselves are also accustomed to give opinions, and the remarks content in lessons has increased through lesson study.

### **6.2.2 Increase of preparation time for lessons**

The examination time has also increased in daily lessons. We have also confirmed that they take in hand the guidebook for daily lessons. As survey has revealed, awareness of the preparation for lesson has changed, so the time to see textbooks or guidebook has increased.

The distributed guidebook, that is external elements, respond to internal motivation of teachers through lesson study. As a result, they also began to see the guidebook for daily lessons. They had not able to realize its effectiveness. However they desire to give good lessons in lesson study, and create the lessons by using the guidebook which they do not

hand usually, and get a successful experience with it. They gradually have got into the habit of consulting the guidebook when they are in trouble or wondering for lessons through lesson study.

## **6.3 The no-changes in daily lessons against the changes in Lesson Study**

### **6.3.1 Enhancement of teaching materials**

In daily lessons, it is still a little to use the materials actually. In the observation, we could hardly see the teaching materials for daily lessons. Through training and lesson study, they understand the importance of teaching materials. However, it is hardly used in daily lessons. It is said that they consider a burden to prepare it from the survey. They feel the busyness of daily operations in elementary school because a shortage of teachers. Therefore, preparation and study for teaching materials, for which they have to take much time, is not performed unless special.

In addition, they have recognized that teaching materials are just using the experiments or concrete materials. However, it can be also an effective teaching materials that blackboard and textbooks. Now they have understand the effectiveness of teaching materials through lesson study, if they become able to use textbooks and blackboard effectively that are not need to prior preparation, they would improve the quality of daily teaching.

## **6.4 The no-changes in lesson study nor daily lessons.**

### **6.4.1 Contribution for children to the opportunity to think about teachers’ question**

Remarks and activities of children have certainly

increased in advocating the child-centered learning. However, it cannot be say that it really gives the opportunity for children to think. It is still just questions which predetermined the answer. These questions are not that children think with their existing concept or their own experience. And teachers only correct wrong answers which children give.

This regard, it not be noted in the lesson review meetings, not only practitioner but observers don't have insufficient understanding about opportunity for children to think. It is due to the lack of such experiences to them. They need to discuss and understand what kind of questions or activities can give the opportunity for the children to think.

#### **6.4.2 The contents of the lesson review meeting**

It is related with the above, the contents of the lesson review meeting don't contribute enough to improve the quality of teaching. From the table 5, although opinions are described by each of participants, any opinions are quick afterthought, and almost are from subjective view with weak proof and don't include activities' intention and effects. They don't discuss what causes are, and what will eliminate it.

As the factor, it is considered that awareness of the participants is low and they have no knowledge to do sufficient discussion. Also in the survey, they have said that there is no dissatisfaction and improvements with regard to the content of the lesson review meeting. In some practice of other schools, it is seen that active discussions took place from him when even one person with high competence was being in participants. But such resource persons are few.

#### **6.4.3 Participators' subject knowledge and the knowledge of teaching materials**

We cannot see the improvement of participators' subject knowledge. From the survey, teachers also are aware of this. In terms of teaching materials, they have not reach to consider the contents such as what children think and gain from it. Understanding of the subject knowledge and the knowledge of teaching materials is not improved through review meeting, as current status.

It is difficult for lesson study to contribute directly to this issue. Change of consciousness through the lesson study affects the self-study for subject knowledge. However, improvement of subject knowledge has not been recognized for the participants as a purpose of lesson study. They don't discuss with focusing on a limited part of the lesson in the lesson review meeting, so understanding and awareness of subject knowledge is not increased.

These above are the changes and no-changes and its factors which we have see through the observation of daily lessons and lesson study. A sense of resistance to child-centered activities and the preparation of lessons have become low. The time to prepare for daily lessons has also increased and it can be said that the quality of lessons have changed. The consciousness has changed, and the behavior has changed through the lesson study.

On the other hand, there is the issue that they cannot discuss the essence of the lessons in the lesson study, nor gain deeper understanding of the subject knowledge and the knowledge of teaching materials. The current approach of lesson study is not enough to contribute directly to improve the knowledge or understanding of teachers.

From the analysis of the changes and no-changes of



teachers and lessons, in order to improve the quality of lessons through lesson study, It can be said that following factors are necessary; (1) The change of awareness to preparation for lessons. (3) Sharing the purposes of the lesson study. (2) Sufficient Subject knowledge of participants.

These are facing some issues that will be solved, other issues that will be not solved by continuing to this method of lesson study. Participants have to notice the issues, and improve the method and awareness of lesson study. It will lead to improve the lessons in Bangladesh.

## **7 CONCLUSION: POSSIBILITIES AND ISSUES OF LESSON STUDY IN BANGLADESH**

Through the observation of lessons and teachers' behavior for half a year, we have analyzed the changes and no-changes in lesson study and daily lessons through lesson study in the experimental school attached to PTI in Rajshahi. The effect of lesson study is not appeared in a short time, it is required continuous implementation and observation. And the effects are not only in the lesson study. In this regard, we have observed by focusing on daily behavior of the teacher, and have clarified various the changes and no-changes for half a year.

Lesson study is recognized exclusive of daily lessons, because practitioner do special prepare and make utmost effort for it. So it is issue that is able to do in lesson study, but cannot in daily lessons. However, the impossible in lesson study is also impossible in daily lessons. We need to understand it and should improve the quality of the lesson in lesson study at first, and to find the teachers' competence through evaluating the lessons. It is possible to contribute to improve the awareness and the ability

of realize it through best practice for the teachers in lesson study. The understanding changes into actual behavior by continuance of successful experience, and it bring good influence in the daily lessons.

In order to further enhance the effects of lesson study, it is necessary to improve the quality of discussion in lesson study. The discussion should be contributed to improve participants' knowledge and understanding. However, the content in discussion is superficial and not been conscious the relation of the before and after.

To solve it, it is necessary to re-recognize the importance of the lesson plans meeting; that is “Plan”. The themes and issues of each lesson study are not set first in Bangladesh. Therefore, they only modify the teaching plan in lesson plans meeting (“Plan”). Because of not recognizing the importance at lesson study in the experimental school attached to PTI in Rajshahi, the number of people to participate is less. However, the sense of purpose of all participants is unified by setting the theme and issues. It is possible to constructive exchange of views by implementing and observing based on it. In the practice of once a month, it is difficult to have the connection of before and after for lesson study. Therefore, it is important to have proper connection within one lesson study, such as confirming in “See” which considered in “Plan”.

The atmosphere to cooperate with colleagues at school level has been grown by lesson study. Lesson study have contributed that the ability of teachers cultivated by national level training is exhibited or sophisticated as specific practices in individual school level. In the future, lesson study compensates for the weakness of the national training, that is practice in actual lessons, and the national training play the part which lesson study cannot

compensate such as subject knowledge, these will be able to elicit more effect each other.

In this paper, we have observed and analyzed only in the experimental school attached to PTI in Rajshahi, but lesson study is implemented across the country. Comparing with other practices is required to explore the match method of lesson study for this country.

Lesson study introduced in Bangladesh is still in developing status. Lesson study introduced from other country would become more suitable form for Bangladesh by continuing its own practices. Therefore, meta-improvement of lesson study by practitioners in Bangladesh is indispensable. In order for lesson study in Bangladesh to contribute to improve the quality of teaching, it is important to accumulate the record, to accumulate practices and overcome the issue.

## 8 ACKNOWLEDGMENT

This paper could not be realized, if there was not a sincere commitment to lesson study at the experimental school attached to PTI in Rajshahi, our research target. Also, for JOCV (Japan Overseas Cooperation Volunteer) and JICA (Japan Overseas Cooperation Agency) experts and staff of JICA who have cooperation in this paper, we would like to thank them to provide us with this precious opportunity.

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## **Improving Students’ Activity and Learning Achievement Through The Use of Cooperative Learning Model in A Lesson Study Enriched With Local Wisdom and Entrepreneurship: A Case Study in The Course Of Counseling for Children with Special Needs**

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**Abstract:** The present study is aimed at improving students’ activity and learning achievements in the course of counselling for children with special needs through the enhancement of learning system by means of lesson study. The samples in this present study were 40 students in the Department of Guidance and Counselling, Ganesha University of Education (GUE). The data of the students’ activity were collected through non–test rubric instrument which include the following indicators: 1) Visual Activity, 2) Listening, 3) Writing, 4). Drawing, 5) Oral Activity, 6) Mental Activity, and 7) Emotional Activity. The data about the students’ learning achievement were collected through the learning result tests which include the following indicators: 1) the right of the children with special needs to enrol in suitable educations as prescribed in the amendment of the 1945 Fundamental Constitution or the UUD 1945, 2) the physiology, psychology and sociology of the children with special needs, 3) The career expectations of the children with special needs, and 4) the contribution of the products of technology enriched with local wisdom for supporting the career expectations of the children with special needs. The study demonstrates that through cooperative learning, students’ learning activity is quantitatively amplified by 3.44 (in likert scale) while the students’ learning achievements increase from 75.89 to 83.45. Further, the present study also shows that there are improvements in the lecturers’ competence in designing, observing, learning process, and the quality of the learning process due to the intensified interactions of the students within the groups while promoting the growth of learning communities among the lecturers which allow lecturers to share their knowledge. Moreover, the present study also indicates that the learning model encourage the students’ character building through the edification of local wisdom values and entrepreneurship.

**Keywords:** learning activity; learning achievement; cooperative learning; local wisdom; lesson study.

### **1 INTRODUCTION**

Cooperative learning was implemented to improve the students’ learning community, because factually the students’ learning behavior can be classified into 3 groups, those are 1) the active learning group in learning process, 2) the group which is sometimes being active or sometimes being inactive in learning process, and 3) the inactive learning group in the learning process. The facts showed that from the whole learning process, only 30% from the total students that could maintain their learning activity into high criteria, good in face-to-face activity in the classroom, independent in finishing the tasks, even in field skill test. Research data from Center of Research, Ganesha University of Education (2013) also obtain the result that AQ (Adversity Quotient) of the GUE students were in low criteria. This condition cannot be postponed anymore; there should be a

solution implemented to fix this. One of the solutions which can be used to fix the process of learning system. Three components which basically need to be fixed in the learning system are: 1) students’ learning process, 2) claim of students’ learning success quality by the improvement of learning tools/content, 3) lecturers’ competency in carrying out the learning process. The three components can be achieved by managing the learning more effectively.

Besides, learning management assessment becomes a very important factor in learning. This learning assessment is the term in lesson study. The implementation of cooperative learning by Think Pair Share, Jigsaw, Project, Two Stay Two Tray techniques, can be planned into 4 cycles with the steps like plan, do, see, reflection which are oriented in learning act (lesson study). Therefore, by the research in improving students’ learning activity by

using cooperative learning model can help the students' success in learning and can improve their competency as the next counselor.

The purpose of this research is to improve the students' learning activity and students' learning result in lesson of children with special needs (ABK).

Learning activity is the activity which is done by an individual by making use of his/her intellectual ability, emotional, maximally in doing the learning activity (Sadirman, 2007:6). Meanwhile, Sujana (2002:28) stated that learning activity is the process which is marked by the changing in one self.

Basically, learning is doing, no learning if there is no activity. That's why activity is an important principle in learning and teaching interaction. In learning activity, there are some principles that oriented into psychological view that is based on old psychological view, that learning is dominated by teachers' activity while modern psychological view, learning is dominated by students' activity. Therefore, learning activity is the whole students' activities in learning process, start from physical activity into psychological activity.

Therefore, activity is an important principle in learning interaction, means that in learning needs the presence of activities. Without activity, the learning process cannot be happened. It is said as it is because activity in learning can give continual effect in the improvement of cognitive, affective, or psychomotor aspects.

Learning activity along the learning process is one indicator about the students' pretension for learning. The indicator that can be used to observe the students' learning activity are (a) students' enthusiast in following the learning activity, (b) the interaction between teacher and student, (c) the interaction between student and student, (d) group's cooperation, (e) students' activity in group discussion, (f) students' skill in using the media or tools, (g) students' participation in concluding the material. Other than these indicators, Hamalik (2001:34) stated that the basis in using the activity in learning process can contribute into some things like (a) students search their own experiences and directly experience it; (b) do by their own selves will develop all the students' personal aspects; (c) develop the harmonic cooperation among students; (d) students learn and work based on their preferences and ability; (e) develop class discipline normally and learning situation become democratic; (f) tighten the school and society relationship, and relationship between parents and teacher; (g) learning is carried out realistically and concrete so that develop understanding and critical thinking and avoid verbalism; (h) learning in school become life like the activity in social life. Based on these indicators, it is created potentially the students' community situation by cooperative learning.

Furthermore, Dierich (in Hamalik, 2007:55), classified learning activities into 8 groups, those are: (a) visual activity, that is reading, seeing pictures, observing experiment, demonstration, exhibition, and observing the people work or play; (b) oral activity that is proposing a fact or principle, connecting an event, asking a question, giving suggestion, giving opinion, interview, discussion, and interruption; (c) listening activity that is listening a material presentation, listening to conversation or group's discussion, listening to game, and listening to radio; (d) writing activity that is writing story, writing report, examining an essay, copy material, making summary, doing test, and filling in questionnaire; (e) drawing activity that is drawing, making graphics, chart, map diagram, and pattern; (f) motor activity that is doing experiment, choosing the equipments, doing exhibition, making model, organizing game, dancing, and gardening; (g) mental activity that is reflecting, remembering, problem solving, analyzing, factors, seeing, relationships, and making decision; (g) emotional activity that is interest, differencing, bravery, calm, and others. The activities in this group are in all activities and filling in to one activity to the other activities.

Based on the reviews, it can be concluded that learning activity is the series of activity that was done by the students by making use all the intellectual , emotional maximally in joining the learning so that it will change the learning habits and improve himself psychological and physically.

In this research, students' learning activities were focused into 8 learning activity as following: (a) visual activity was done in students in group to produce a plan of tool based on product that can be used to special needs students, (b) oral activity, was observed by sharing into group when they presented the product (from ideas presentation, then plan, do, reflection, result presentation), and the benefit of the product, (c) listening activity was done by students' sharing in presenting the product into a group discussion, (d) writing activity, was done when the students made a report, (e) drawing activity was done when the student made product's design which is resulted based on the needs of special needs student, (f) motor activity was done when the event of finishing product, (g) mental activity was done in the high critical thing in presenting the ideas, defending the ideas, doing reflection of product, (h) emotional activity was done by the formation of attitude, emotional which happened in group works or result's presentation.

## 2 RESEARCH DESIGN

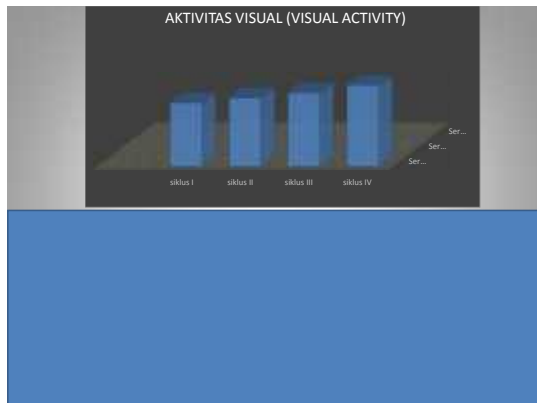
The type research which was done is Action Research in classroom, with cycle approach of plan, do, see, and reflection.

The research samples were about 40 people of the fifth semester students of Guidance and Counselling department. The data about students' learning activities were collected by using non-test rubric that is rubric which follows the indicators; 1) Visual activity, 2) Listening Activity, 3) Writing Activity, 4) Drawing Activity, 5) Oral Activity, 6) Mental Activity, 7) Emotional Activity' meanwhile, the students' learning result for the special needs students were collected with the test result which consist of 1) special needs student's right to get education based on UUD 1945, (2) physiology, psychologies, and sociologies problem that faced by the special needs students, 3) expected career which is faced by the special needs students, 4) Contribution of technology based on the local wisdom for the ABK that support their expected careers. The research data was analyzed by using the descriptive statistic analysis.

## 2 RESULT AND DISCUSSION

Research findings showed that by cooperative learning, students learning activities improved quantitatively (in scale five) obtained the mean of 3.44. And the improvement result of each indicator reached the increase as follows.

(1) Visual Activity, in four cycles showed the increase in the mean scores in cycle I = 3.95, in cycle II = 3.98, in cycle III = 4.05, and in cycle IV = 4.10



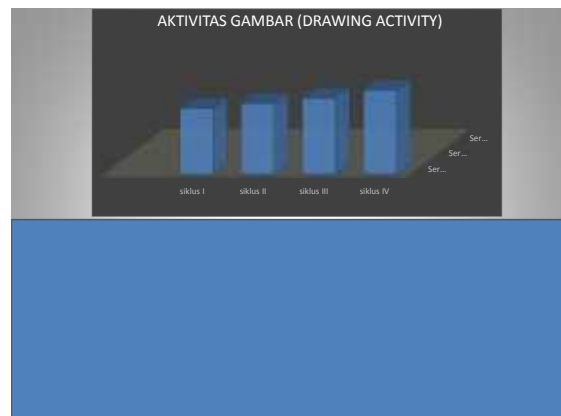
(2) Listening Activity; in four cycles showed the increase of mean scores in cycle I = 2.95, in cycle II = 3.08, in cycle III = 3.12, and in cycle IV = 3.15



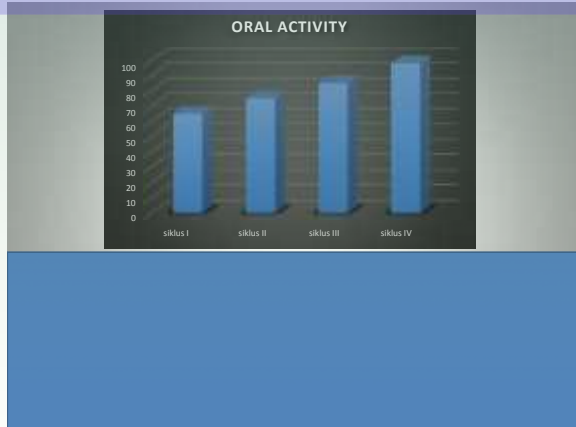
(3) Writing Activity, in four cycles showed the increase in mean score in cycle I = 2.98, in cycle II = 3.15, in cycle III = 3.45, and in cycle IV = 3.80



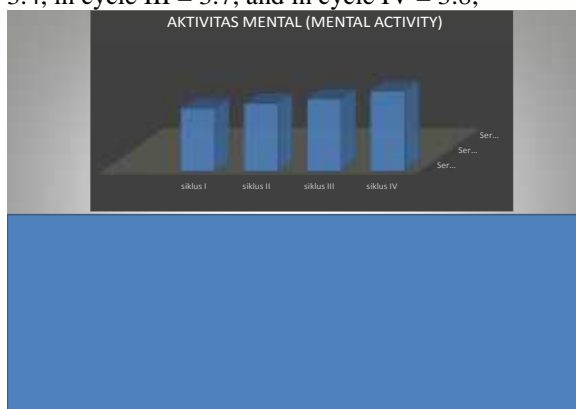
(4) Drawing Activity, in four cycles showed the increase of mean score in cycle I = 2.80, in cycle II = 2.95, in cycle III = 3.08, and in cycle IV = 3.20;



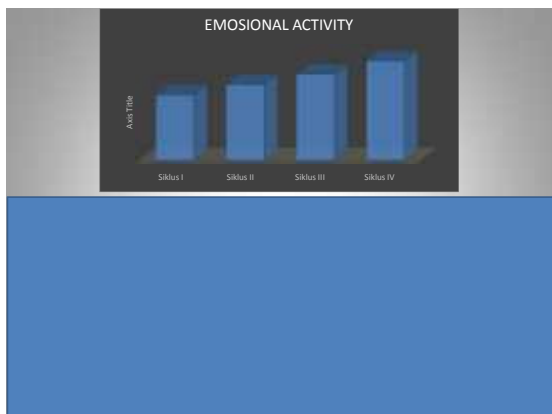
(5) Oral Activity, in four cycles showed the increase of mean score in cycle I = 3.0, in cycle II = 3.2, in cycle III = 3.3, and in cycle IV = 3.5;



(6) Mental Activity, in four cycles showed the increase of mean score in cycle I = 3.0, in cycle II = 3.4, in cycle III = 3.7, and in cycle IV = 3.8;



(7) Emotional Activity, in four cycles showed the increase of mean score in cycle I = 2.1, in cycle II = 2.2, in cycle III = 2.4, and in cycle IV = 2.5;



Thus in research findings also showed the increase of students' learning achievement with the ratio of mean score before cooperative learning = 75.89 and after cooperative learning = 83.45.

Research findings altogether can be said as significantly increasing. All the activities aspects experienced improvement from cycle I to the next cycles, with producing a product that contributes to the life of children with special needs according to this lesson study. The local wisdom value and entrepreneurship products become the focus of the

development of all the students' activities. However, the emotional activities improvement showed the slowest improvement and having the lowest score of improvement than the others activities. Based on the assessment rubrics, it was obtained the findings that students' emotional quotient by toleration, appreciating someone's opinions, cooperation and respecting each others become findings that need to be focused to be improved in the next meeting.

### 3 CONCLUSIONS

Based on the explanation above, it can be concluded that: (1) the occurrence of lecturer's competence especially in designing the learning, doing learning observation, and doing learning innovation, (2) the occurrence of learning quality's improvement, from conventional learning which was dominated by the lecturer into the learning that gave chance to the students to interact with other students in groups, (3) prompt the formed of learning community among the lecturers especially those in one family altogether plan a learning. This was different with before implementing the lesson study, it was rarely seen a sharing among the lecturers, or among the junior and senior which sit together to discuss the learning plan, and (4) the development of students' character building by the edification of local wisdom values and entrepreneurship. It is as the commitment to enlarge the implementation of lesson study.

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## How PLC Helped Improve The Learning And Teaching Of English In SK Seremban 2B That Lead To The Improvement Of Students' Academic Results

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**Abstract:** PLC was first introduced in SK Seremban 2B in 2012. Since then the overall teaching and the learning process among teachers have improved tremendously. This presentation will focus on English because it is our most challenging subject. In our 2013 UPSR (a national examination for Year 6 students, children of 12 years old) showed that English was our weakest subject among the 5 subjects that the students sat for. The March 2014 monthly examination showed a 10.2% improvement in pupils test results. We are hoping for better results in our mid-year and final exams. In this presentation, I will be sharing teacher's comments, tips and video presentation of my teacher's classroom teachings. I will also share information on how teachers work as a team to improve the school standards, vision and mission. SK Seremban 2B is a Cluster School under the Ministry of Education of Malaysia. We have won many awards in national and international arenas. We are one of the many schools in Malaysia chosen as a school on the bench marking list.

**Keywords:** PLC, English, SK Seremban 2B,

### 1 INTRODUCTION

SK Seremban 2B achieved their Cluster status in the year 2013. The statues bestowed to a school that show a good track record in both academics and co curriculum. Being such, the school has a challenge to make sure that the CGPA of the school's English result is maintained above 1.90 in the UPSR. Students sit for 5 papers and English is one of them. In 2013, the CGPA for English was the lowest at 2.03. That got both administrators and teachers alike seeing red. The statues can be revoked if the results do not improve for the next three years. In order to maintain the Cluster statues, the school must be in the Band 1 category. Meaning all subjects maintains their CGPA above 1.99.

Professional Learning Community (PLC) was introduced to SK Seremban 2B early 2012. It was on a trial basis whereby the officer wanted to get some feedback. A team of 5 teachers were called upon for this purpose. Videos were shown and explained in depth. The teachers were impressed and they started with peer coaching. They moved on to video critique and walkabouts. It started with much enthusiasm but other elements in the day to day life of a teacher got the better out of them. The ideas fell short and the whole project took on to a standstill. That year, the result was a CGPA of 1.90 for English.

In December 2013, during the first panel meeting for the academic year of 2014, it was again decided that the PLC concept must be carried out with much gusto to improve the results in 2014. At the time of submission of this paper, the 2014 UPSR results have not being released. It is been decided that to attain a good result cannot be the burden of only the Year 6 teachers but a culture of positive teaching and learning must start as early as Year 1

### 2 METHODOLOGY

There are 981 non-native speakers of English aged between 7 to 12 years old in the school. In the Malaysian education system, these children will study from Year 1 to Year 6. These children will then sit for a centralised assessment examination known as UPSR (*Ujian Penilaian Sekolah Rendah*) in Year 6. CGPA for 157 students, in 2012 was 1.90 and in 2013 were 2.03 for English in the UPSR result. On an average each year there are at least 8 failures and 40 students who achieve a minimum of grade C which is equivalent to less than 40% in score.

Research also shows that the children's economical background varies into several categories. 30% are from the very affluent group.



30% are from the middle income group and 40% are from the lower income group. Many parents from the lower income group are either with basic qualification themselves or none at all. Though many children get extra tutorial help, the lower income has minimal help. Study shows that most of the failures are from the lower income category. Here the parents speak little or none at all in English with their children. Most cannot help their children with their homework or projects. They neither have the time nor mean to do so.

In a total of 56 people in the teaching force, there are 8 non-native speakers of English teachers. All of whom are trained in various teacher training colleges in Malaysia. 1 with a Masters degree, 6 with a Degree in English and 1 college trained. On an average these teachers will teach 3 or 4 classes of English amounting to 630 or 840 minutes per week. School starts at 7.40 am and ends at 1.30pm. In addition, each teacher holds on average 5 to 6 important portfolios in co curricular activities. School starts on a Monday through Friday. Every afternoon, the Muslim students attend religious classes from 2.30 pm till 5.00pm. Every Wednesday evening sports practice from 5.00 to 6.00pm. This is also known as 1M1S – 1 *Murid* 1 *Sukan* policy. Which means each child must partake in at least 1 game.

### 3 DISCUSSION

During the last English panel meeting of SK Seremban 2B in October 2013, The panel members decided collectively that serious actions had to be taken to curb the issue of falling grades in English.

The following questions were tabled:

1. Why can't the students pass the exams in Year 6 after 6 years of learning English?
2. Are the children learning?
3. Are the teachers teaching?
4. Are the teaching methods attracting or distracting the students?
5. What is the real reason behind these failures?

The field notes carried out by teachers have shown that the teaching and learning process has to change. The teacher has to pay close attention to students who fall behind. The teacher cannot give individual attention to a child in a class of 43 – 45 students per class. The younger they are the more challenging it would be for the teacher. The

following actions have been taken to curb the problems. As stated:

1. The teacher teach not train the student to answer essay based questions
2. Teach grammar not rote learning.
3. More aural oral exercises are needed to teach language.
4. The use of IT is encouraged but only interactive ones. The more the better.
5. Back to basic concept must be implemented. The manila card has a better impact then buying ready to use material prepared by suppliers.
6. Homework must be objectively given and corrected as soon as possible.

To do all those above, the limited time and burden on a teacher in a day is a real challenge. The teachers have realised that they cannot do it alone. Help is needed. So the whole of 2014, a new approach was adopted by all English teachers. For the first 3 months, teachers were teaching per normal. At the end of March, after reviewing the first test, they deliberated and assigned a partner. No doubt it was a burden as the teachers concern had to sacrifice their free time but nevertheless, they wanted a change more than anything. It was difficult at first but gradually they were adapting to the changes. Having more than one teacher at a time meant more learning issues were tackled early.

The weaker students were gathered in the afternoon after prayers, and given extra coaching before they went off for their religious classes. Teachers were discussing more about each child and their progress during panel meetings. The minutes of each meeting got longer as more ideas were thrown in as discussion got very intense.

English Progress Report 2014 Seremban 2B Primary School

Year/Level	No. students	1st Term (March)	Mid Term (April)	2nd Term (August)	Final (October)
Year 1	130	130 81.53%	135 84.62%	148 90.77%	157 90%
Year 2	126	141 87.7%	152 94.44%	180 95.19%	181 94.44%
Year 3	137	128 94.16%	161 95.41%	182 95.80%	182 95.80%
Year 4	170	143 81.6%	170 97.1%	177 98.24%	178 97.53%
Year 5	134	140 90.3%	153 91.8%	178 95.9%	180 97.1%
Year 6	130	170 87.7%	170 88.77%	175 90.45%	178 96.77%

Table 1: Number of student passing above 40% and its percentage.

## 4 CONCLUSION

Teaching individually has become a thing of the past. Teachers are opening their doors to ideas and critiques, and critiques are being more constructive. Teachers are learning to work as a team. Each child is being evaluated from the time he or she starts school. Each teacher has learned to be responsible for every child. The concept has been adopted by all other subjects too. The teachers are being more professional in their approaches of teaching. Students are enjoying learning. Evaluation is not only via standardised assessment but also through other methods such as projects and oral test. A child's confidence is raised so that he or she has the ability to receive knowledge.

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## An Implementation of Scientific Approaches by Using *PBMP* Pattern in Implementing Curriculum 2013 through A Participation-Based Lesson study for Biology Teachers of Senior High Schools in Malang Municipality

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**Abstract:** An urgent drive to reform Indonesian education has encouraged a movement of biology teachers in Malang Municipality in order to plan an activity that provide some chances for them to ‘sharpen the saw’, to love each others, and to take care of each others – i.e. a lesson study. It is a descriptive survey-based research. It is conducted by two biology teachers using an inquiry-based learning approach and a combined approach of inquiry and *PBMP* pattern in the classrooms and 34 other biology teachers observing them. The teaching strategy employed is an inquiry-based learning approach and a combination of inquiry-based approach and *PBMP* pattern (*PMBP* – Thinking Empowerment by Questioning). In pedagogy, an inquiry-based learning approach has been frequently discussed although there are only few reports about its implementation combined with *PBMP* pattern. Since Indonesia has executed Curriculum 2013 starting from July 2013, it is very necessary to conduct a lesson study in order to support the implementation of the learning approaches. The research has also found out that the two learning approaches have given valuable experiences to those biology teachers inexperienced in implementing them. A lesson study can become the best means of modeling the teaching strategies with which teachers are not familiar. Therefore, it is necessary to develop school-based lesson studies (*LSBS*). It is even better to implement a participation-based lesson study by encouraging teachers’ awareness of ‘sharpening the saw’, loving each other, and taking care of each other in order to improve professionalism among biology teachers in Malang Municipality.

**Keywords:** Curriculum 2013, scientific approaches, teaching strategy, participation-based lesson study.

### 1. INTRODUCTION

The Minister of Education and Culture Rules and Regulations No. 59 of 2014 on Curriculum 2013 of Senior High Schools states that the curriculum is designed to fit our national and social conditions to anticipate students’ present and future needs. Moreover, we need to consider the internal and external challenges and paradigm shift and the curriculum governance needs to reformulate the 21<sup>st</sup>-century competences needed by the students to meet a highly competitive life in the future, a civilized era of information- and digital-technology-based social constellation. The competence reformulation is expected to shift our paradigms and behavior into high-concept- and high-touch-based paradigms and behavior which require us to change our ways to acquire knowledge and skills and to reinforce attitudes in order to equally develop soft skills and hard skills.

Therefore, Curriculum 2013 is designed with the following characteristics: 1) it is to develop balance between spiritual and social attitudes, curiosity, creativity, teamwork and intellectual and

psychomotor abilities; 2) a school is part of the society that gives planned learning experiences in which students apply what they have learned at school to the society and use the society and environment as their learning sources; 3) it is to develop attitudes, knowledge, and skills and to apply them in any possible situations at school and in the society; 4) it is to provide more time to develop a variety of attitudes, knowledge, and skills; 5) competences are presented in the form of core competences explained in more details in the subject basic competences; 6) the class core competences become the organizing elements of basic competences on which all basic competences and learning processes are developed to reach the basic competences.

To implement Curriculum 2013, it is important for us to reinforce a variety of aspects. To do so, biology teachers in Malang Municipality need to take their parts. Michael G. Fullan as quoted by Suyanto and Djihad Hisyam (2000) suggested that “educational change depends on what teachers do and think...” It means that reforming our educational system really depends on what teachers do and think.

Therefore, it is extremely necessary for biology teachers as members of Biology Teacher Forum (*MGMP – Musyawarah Guru Mata Pelajaran*) in Malang Municipality to participate in the educational reform in Indonesia, especially in Malang Municipality.

Curriculum 2013 put a stress on scientific approaches. *MGMP* is a teacher forum to actualize a variety of educational activities. Applying a lesson study in *MGMP* is one of the activity agendas for actualizing learning practices. Some schools have worked together to discuss learning practices in *MGMP*. However, they haven't had any activities modelling the learning approaches leading to scientific approaches. Although Indonesia has implemented Curriculum 2013 since the academic year 2013/2014 to refine Curriculum 2006, biology teachers in Malang Municipality have understood little about the scientific approach. Therefore, it is necessary to provide a means of applying biology learning strategies based on a need to develop competences and the characteristics of biology materials, and the designs of alternative learning approaches. The most appropriate means to provide the activities is a participation-based lesson study. Moreover, it is the best forum to disseminate the implementation of Curriculum 2013 putting a stress on scientific approaches.

It has been earlier suggested that scientific approaches are required in the learning of Curriculum 2013. Some teacher trainings have been held by the government. These activities are to disseminate and to reinforce the implementation of Curriculum 2013. However, there are no special trainings discussing a variety of learning approaches. Furthermore, there are only a small number of studies about how the students learn through a variety of learning approaches leading to scientific approaches as well as about the strengths, weaknesses and obstacles in implementing the scientific learning. The learning other than those recommended as alternative learning approaches by the government haven't come into view. That is why we need *MGMP* to discuss those different topics. The forum is very important for teachers to improve their professionalism. Masaaki Sato (2007) suggested the same thing in Susilo and friends (2010) that *MGMP*-based lesson study can improve teachers' professionalism. Although teachers can learn by themselves, they have limitation. Therefore, it is necessary to give teachers more chances to learn good practices of learning strategies and teaching techniques from each other through *MGMP*. They rarely get the chances to learn at their schools. It results in the need to optimize participation-based lesson studies for biology teachers in *MGMP*. Considering this idea, the writers conducted a participation-based lesson study for biology teachers of senior high schools in Malang

Municipality by applying scientific approaches with *PBMP* pattern in implementing Curriculum 2013.

## 2. METHOD

It is a descriptive survey-based research. The writers conducted a survey in two classes that were holding open classes on 14 September 2013 in SMA Negeri 8 Malang. The activities were initiated by Biology Teacher Forum in Malang Municipality and based on the participations of biology teachers there. The scientific approaches were employed with two learning approaches i.e. inquiry-based learning approach and a combination of inquiry-based learning approach and *PBMP* pattern. The inquiry-based learning was modeled by Ms. Naning and a combination of inquiry-based learning approach and *PBMP* pattern was modeled by Ms. Lilik Triani. Both are biology teachers of SMA Negeri 8 Malang assigned as one of those target schools of Curriculum 2013 in the first year. There were 34 observing teachers both from public and also private schools in Malang Raya (Malang Municipality, Malang Regency, and Batu Municipality). The main topic being taught was Natural Diversity, including in-site and ex-site conservations. The instrument of the survey was an observation sheet containing the following questions: 1) 'Have all students really studied today's learning topic?,' 2) 'What is their learning process like? (with real facts and supporting reasons), Which students couldn't follow the class today?' (with real observed facts and the students' names), 3) 'Why could the students not study well? What are the causes and what are the alternative solutions?,' 4) 'How did the teacher encourage those passive students to study?,' 5) 'What lessons did you get from observing today's learning?,' and 6) 'What are the interactions like – between students in one group, between students in different groups, between students and the teacher, between students and their learning sources/media, between students and the environment?.' The next step describing the implementation of scientific approaches with inquiry-based learning approach and a combination of inquiry-based learning approach and *PBMP* pattern. Inquiry-based learning approach has the following syntax : 1) presentation of phenomena, 2) observation, 3) statement of the problem, 4) statement of the hypothesis, 5) data gathering/information exploration/finding, 6) data analysis/association, and 7) conclusion. As for a combination of inquiry-based learning approach and *PBMP* pattern, it has the following syntax: 1) presentation of phenomena, 2) do: prepare, observation, statement of the problem, statement of the hypothesis, data gathering/information exploration/finding, data analysis/association, 3)

consider, 4) think, 5) evaluate, 6) conclusion, and 7) direction.

### 3. DISCUSSION

Lesson study support the implementation of Curriculum 2013. Curriculum 2013 has only been implemented for two years in Indonesia, needing more dissemination. The scientific approaches consist of those activities of observing, questioning, gathering data, associating, and communicating or *5M*. Only few teachers have understood the learning approaches. They need real models and to see the teaching practises in person. The scientific approaches can be implemented using a variety of such learning approaches as inquiry-based learning approach. Only few biology teachers in Malang Municipality have understood inquiry-based learning approach. Based on Minister of Education and Culture Rules and Regulation No. 65 of 2013 on the Standard of Process, the learning approaches implemented in Curriculum 2013 are scientific approaches. The approaches are implemented in a constructivist inquiry-based process. The implementation results in the increasing curiosity, observation skills, analysis, and communication. It is very necessary to implement this kind of learning to prepare the young generation mastering basic concepts through biology learning. It means that an essential learning is needed to prepare them to be able to master the basic knowledge of biology and its application. Since teachers have only understood little about inquiry-based learning and other innovative learning approaches as models of scientific approaches, they need to see the approaches being modeled and the best way is to have a lesson study. In the Handbook of *MGMP*-based and School-based Lesson Study (2009) there are three parts: Plan (planning), Do (implementing and observing) and See (reflecting). These three parts enable teachers to ‘sharpen the saw’, love each other and take care of each other in learning practices. Therefore, a lesson study is appropriate to model a variety of learning practices.

To prepare collectively the lesson plan can give valuable experiences to those implementing the curriculum, especially Curriculum 2013 and encourage teachers to observe and discuss the learning practices. Teachers will have a good chance to understand each other about new things they haven’t mastered, especially the scientific approaches. Furthermore, to conduct a lesson study will help to faster disseminate the scientific approaches. In conclusion, a lesson study is an appropriate means of supporting the implementation of Curriculum 2013.

Next, the Minister of Education and Culture

Rules and Regulations No. 59 of 2014 Attachment III states that biology subject has a vital purpose i.e. to develop an awareness of the complexity, regularity, and beauty of natural diversity and bioprocesses, and the application of biology, as well as of natural environmental problems, to care about nature as it is a real example of action based on the students’ religions to show the greatness of God the one and only. The students’ biology knowledge consists of factual, conceptual, procedural, and metacognitive knowledge in concrete and abstract domains. Moreover, biology helps them to increase their awareness of technology beneficial for individuals, society, and the environment and of the importance of managing and conserving the nature for the sake of society. We can give experiences to the students in applying scientific methods and about worksafety through observations and experiments, hypothesis testing, data gathering and in having written and oral communication of the experimental results in order to develop their scientific paradigm the live the 21<sup>st</sup> life. It is the duty of biology teachers to develop students’ hard and soft skills in biology equally to provide them with collaborative, communicative, creative and innovative skills and media literacy through inquiry-based, problem-based, and project-based learning. It is also necessary for biology teachers to develop students’ positive attitude toward biology, i.e. is to make learning biology the students’ need, and to encourage them to use biology as a means of problem solving in their personal and social lives. Therefore, biology teachers need to realize the importance of learning biology and Curriculum 2013 makes biology one of those specialized subjects of science and mathematics. By become a specialized subject, biology is expected to reach its goals.

According to Istamar and Ibrohim (2008), a lesson study is a case analytical method in the learning practices. It is conducted in the form of open class that can give valuable experiences to peer teachers by observing and having some reflection on the learning practices. It helps to improve teachers’ professionalism in their teaching practices. A lesson study benefits the teachers who conduct the teaching practices and becomes a forum to learn from each other about real teaching practices in the classrooms. Peer teachers observed different things related to the learning practices and recorded their observations in the observation sheets. It would be useless if they didn’t collectively observe and study the practices for the sake of learning and then make the activities as their habits. A lesson study will be the right means of doing so, especially in *MGMP*.

*MGMP*-based lesson study will unite the teachers in improving their professionalism. The regular teacher forum gives chances to biology teachers to meet, question, discuss, find solutions and

model the learning practices. It creates personal and social relationships among them. The Handbook of *MGMP*-based and School-based Lesson Study (2009) also suggest that *MGMP* is a means of encouraging the improvement of teachers' professionalism and was formerly founded to become a model of teachers' training in 1993, a continual project on Teacher Work Reinforcement (*PKG – Pemantapan Kerja Guru*). *MGMP* formerly known as *PKG* gives many benefits to teachers. However, some *MGMP* activities have provided more administrative experiences than practical ones, making teachers less observant and have fewer reflections on the learning practices as allegedly the *MGMP* main activities. It is expected that *MGMP*-based lesson studies are developed since they help teachers to 'sharpen the saw', love each other, and take care of each other to improve their professionalism by observing and discussing the learning practices.

Describes the results of learning practices in the form of students' real behaviors during inquiry-based learning and a combination of inquiry-based learning and *PBMP* pattern. Students generally had studied that day's learning topic at the class with inquiry-based learning. It is evident from the students' firmness to answer the teacher's questions about in-site and ex-site conservations and Wallace and Weber lines and from the concentration and enthusiasm they showed when they were watching a video. Only some students hadn't studied the topic, which is evident from the fact that some group members were passive and didn't respond the teacher's questions and that they didn't concentrate on the video (they sometimes seemed to look at other directions). The same things happened at the class with a combination of inquiry-based learning and *PBMP* pattern. Students generally had studied, which is evident from the fact that they were able to answer the teacher's questions during the introduction; they paid attention to the teacher's explanation, articles and their worksheets; all students had seriously done their worksheets; almost all students actively discussed with the group members (only some students were passive). Students at the second class studied well because they had comfortable seats and had brought articles and *PBMP* worksheets with them before the class started. It means that they had understood what they were going to study. They had studied because they were motivated by the learning sources from the *Kompas* articles and a video that attracted their attention. This kind of learning prepares the students physically and physiologically to study. The same statement is written in Attachment IV of Minister of Education and Culture Rules and Regulations No. 81A of 2013 on the learning general guidelines that learning activities are designed to give learning experiences involving mental and physical processes through interactions

between students, students and teachers, environment and other learning sources in order to reach Basic Competences – *KD*. Thus, learning process has started since a teacher prepares students physiologically and physically even before it comes to the main activities of learning.

It is formerly suggested that students generally had studied and only some of them hadn't studied well. There were six students having not followed that day's learning at the first class with inquiry-based approach. Their reasons are varied from being more interested at the cellular phone, having not understood the benefits of studying, having not been motivated to study, finding difficulties to study in a noisy classroom, not having courage to give his/her opinions, and not having a habit of asking questions. Furthermore, a member of Group 3 didn't actively participate in the group discussion in the second class. Next, two members of Group 4 sometimes talked to the other members while the teacher was explaining the learning materials but they stopped immediately and directed their attention back to the teacher's explanation. A member of Group 4 discussed something different from the learning topic but the other members kept leading him/her to go back to the right topic. Then, all members of Group 6 had similar opinions (they took examples from their friends' opinions and didn't have their own opinions). A member of this group had had an article but he/she only lowered his/her head and didn't read it. Another member covered his/her article with a piece of paper and another one didn't write his/her observation results on the video although the teacher had informed in the beginning of the class that the observation results would be scored. The reasons why those students hadn't studied are that they didn't have a reading habit; the articles under discussion were not so interesting; some students didn't have prior knowledge, making them unprepared to acquire the materials; they had not been motivated to follow the learning or to join the group discussion; there were so many exercises to do in their *PBMP* worksheets that they got bored and decided to chat with the other group members. Teachers get a valuable lesson related to classroom management from this class. Thus, teachers need to better manage their learning to involve the students more in studying.

The following are some solutions to the problems in the two classes: 1) to give particular attention to those students unprepared to study, 2) to give more encouragement to those students not actively participating in the learning, 3) to accommodate each student's unique learning style, 4) to explain in the beginning of the class about the benefits of materials they are going to study, the learning objectives, the learning strategies, the assessment rubric, including the use of worksheets,

5) to train the students' questioning skills in the learning, 6) teachers always give questions to passive students, 7) teachers involve the students to participate in the question-answer session, 8) teachers encourage the students to be active through questions, 9) teachers play audio videos to get more attention and enthusiasm from the students, 10) teachers motivate the students to have a group discussion and visit each group, 11) teachers approach the students not participating in the learning, 12) teachers invite all members of a group to give their opinions in the group discussion, 13) teachers encourage the students to do scientific activities as written in *PBMP* worksheets, 14) teachers visit each group, 15) teachers show and mention the name of groups less active, and 16) teachers understand each student's unique learning style. Teachers need to respond quickly to the learning situations by using those solutions to make some improvements. They have to understand each student's characteristics in designing their lesson plans. Minister of Education and Culture Rules and Regulations No. 81A of 2013 on the implementation of Curriculum 2013 suggests that to reach the required qualities as designed in the curriculum documents, the learning activities have to base on the following principles: (1) to be student-centered, (2) to develop students' creativity, (3) to create a pleasant and challenging atmosphere, (4) to contain values, ethics, aesthetics, logics and kinesthetic, and (5) to give different learning experiences by applying various strategies and methods of fun, contextual, effective, efficient, and meaningful learning. This kind of learning will keep the students from not participating in the learning. It is a solution to the problems of teaching in the classrooms. Moreover, Iskandar (2011) suggested that the learning essence is that individuals discover and transfer information in order to make it their own information and knowledge through the learning process. That the students actively discover their own knowledge is the ideal goal of the learning objectives set by teachers. Therefore, teachers implement a learning approach to reach their learning objectives and to provide the students with skills and to avoid problems from taking place in the classrooms.

Teachers get many valuable experiences from the lesson studies. The activities are to improve teachers' professionalism. The valuable experiences mentioned by the observers illustrated that teachers get real examples of learning practices from open classes. Videos encourage thinking processes although a video with less coverage may create difficulties in motivating students to question the video content continued by data gathering, data analysis, and conclusion. Thus, teachers need to carefully choose a video as a replacement to real objects which students will observe. They can use

videos as phenomena sources to activate students' minds to come up with some questions. Inquiry-based learning approach and a combination of inquiry-based learning approach and *PBMP* pattern give valuable experiences to the observers related to the implementation of learning syntax. Teachers can directly observe the strengths and weaknesses and how the students study through this activity. The learning approaches with syntax obviously help teachers to direct the learning processes. Various learning sources will give motivations and varied learning experiences. Next, positive reinforcement will increase the students' enthusiasm to study. Then, preparing IT equipment before class will help the learning to run smoothly. These are valuable experiences acquired by observing the learning practices. Besides that, the learning practices will become real examples of implementing scientific approaches with inquiry-based learning approach and a combination of inquiry-based learning approach and *PBMP* pattern. Thus far teachers haven't fully understood the differences between the learning objectives and Competence Achievement Indicators – *IPK*. Minister of Education and Culture Rules and Regulations No. 59 of 2014 on Curriculum 2013 suggested that the learning objectives are formulated based on the Basic Competences/*KD*, using observable and measurable Operational Terms and cover attitudes, knowledge, and skills. They are formulated to meet *IPK* with sentences containing the following 4 elements: A (*audience*), B (*behaviors*), C (*conditions*), and D (*degrees*). *IPK* is formulated after the learning objectives are formulated. Teachers' confusion to tell the differences between *IPK* and the learning objectives can be solved through open classes. Thus, lesson studies give many experiences to teachers on things they haven't known before. To choose articles appropriate for the materials under discussion will really help to present phenomena that will be studied. It is another valuable experience for the observers. It is not easy to choose the most appropriate article/learning media fitting the learning objectives and approaches. The students' freedom to give their opinions at the class implementing a combination of inquiry-based learning approach and *PBMP* pattern is dominant comparing to those at the class implementing inquiry-based approach. *PBMP* worksheets can manage students' thinking pattern (paradigm) to become logical and systematical through questions in the stages/phases of ponder, evaluate, and think. This learning practice is very valuable for teachers. Thus, it is necessary to continue doing these activities through *MGMP*.

Indonesia has executed Curriculum 2013 since the academic year 2013/2014 as an improvement of Curriculum 2006. The learning in this curriculum put a stress on the use of scientific approaches. The scientific approaches encourage students to think

critically, systematically, logically, and carefully, and to develop students' courage to communicate with other members of the group, to focus students to understand concepts and to improve interactions between students, and to train students to associate concepts. The most appropriate learning to realize these is inquiry-based learning approach. According to Kristiani (2005) the benefit of implementing inquiry-based learning approach is that teachers may encourage students' curiosity to know something, motivate students to be willing to continue doing activities until they discover their own answers to questions, learn to solve problems independently, and have critical thinking skills. The questions will be answered through scientific processes. According to Eanes (1997), a good technique to question will effectively help to develop understanding. Moreover, it is also suggested that good questions with the right use will not only help students to understand the content of materials but also help to guide them into critical and elaborative thinking about the content. Therefore, questioning techniques can develop not only understanding but also higher-level understanding. Kristiani (2005) insisted that inquiry-based learning approach needs a learning strategy with scientific methods and give chances to have more meaningful learning. The same thing was suggested by Eanes (1997) i.e. “.....by helping students understand the relevance of the learning to their own lives and experience, the value of the learning becomes more obvious.” This kind of learning is found when students are trained to discover concepts using their logical thinking pattern with inquiry-based learning approach. Then, according to Iskandar (2011) recently the term 'inquiry' becomes important because inquiry is the main strategy in the education of sciences. Yanger (2009) in Iskandar (2011) suggested that inquiry is the 'key' to conduct an investigation/examination in sciences. Next, Nurhadi (2003) stated that inquiry-based learning approach triggers students' curiosity to know something, motivate students to be willing to continue doing activities until they discover their own answers to questions, learn to solve problems independently, and have critical thinking skills. Thus, considering its many strengths, inquiry-based learning approach needs to be disseminated among biology teachers through lesson studies.

The results of the research on inquiry-based learning approach have showed its strengths. Other learning approaches may also have their own strengths such as *PBMP* pattern. It has strengths although teachers know little about it. Corebima has developed a learning approach proven to improve students' thinking skills known as *PBMP* (Thinking Empowerment by Questioning ) (Corebima, 2005b). In its implementation, Zubaidah (2001) suggested that *PBMP* can be collectively planned by students

and teachers. Teachers become catalysts in creating questions. Those questions planned in *PBMP* are divergent and open-ended questions in student worksheets to construct the students' understanding. These kind of questions encourage students to develop their reasoning to solve a question as a problem. The questions delivered are interrelated questions, guiding the students' thinking patterns. It helps the students to become independent learners. Then, independence is one of metacognitive indicators. Therefore, *PBMP* can develop students' metacognitive and reasoning skills and their thinking processes. According to Corebima (2000a, in Zubaidah, 2001), *PBMP* or TEQ = (*Thinking Empowerment by Questioning*) is a learning pattern with no informative series of interrelated questions written in *PBMP* worksheets. Then, Crown (1989, in Zubaidah, 2001) suggested that critical thinking skills can be developed through various activities such as creating questions. Questions will trigger students' responses to support their thinking processes. *PBMP* learning suggested by Zubaidah (2001) is similar to the scientific learning idea suggested by Bunce (1996), i.e. help them to think, help them to formulate questions, help them to find answers to the questions. The important thing to highlight is that there is the word 'help' and not 'make' or 'tell'. It means that the students are the ones that study and teachers will only help them to study. It is evident that students are expected to be independent and be able to control their own learning processes. These skills are metacognitive skills. The effects of *PBMP* learning are that the students master biology knowledge and understand the scientific processes better than those students taught with traditional learning approaches. The effects correspond with what Crown (1989) suggested that critical thinking as an indicator of high-level thinking skills can be developed through such activities as questioning or inquiry-based learning approach. This discovery process helps students to get the best possible scientific knowledge and to understand scientific processes. Inquiry-based learning approach and *PBMP* pattern have similar characteristics. Combining the two approaches will reinforce the thinking independence. Thus, a combination of inquiry-based learning approach and *PBMP* pattern an innovative learning strategy necessary to disseminate. Considering that the combined approach has been insignificantly studied, it needs to be modeled in order to observe the combined syntax becoming the new learning syntax. Through these open classes, teachers get the real picture of the implementation of innovative learning syntax as one of alternative learning approaches in Curriculum 2013.

Metacognition is one of those SKL/Competence Standard for Graduates in



Curriculum 2013. According to Flavell (1999), metacognition is to think about thinking that includes metacognitive knowledge and experiences. Furthermore, Hacker (1998) in Downing (2009) added a part that he called metacognitive skill. Metacognitive skill is influenced by the learning strategies reported by the former researchers (Paidi, 2008; Warouw, 2009; Kristiani, 2009; Danial, 2010; Sepe, 2010; and Bahri, 2010). Thus, we need to choose the learning that gives chances to students to empower their thinking abilities including their metacognitive skills in order to provide them with the best possible conceptual understanding. Kauchak & Eggen (2007) suggested that metacognition, critical thinking and content knowledge or understanding on topics are interrelated elements in learning. Inquiry-based learning approach and a combination of inquiry-based approach and *PBMP* pattern will give experiences to students to develop their metacognition. It is relevant with the Competence Standard for Graduates in Curriculum 2013 i.e. to have factual, conceptual, procedural, and metacognitive skills in sciences, technologies, art and culture with a broad knowledge of humanism, nationalism, and civilization in relation to causes and effects of phenomena and events. Therefore, Inquiry-based learning approach and a combination of inquiry-based approach and *PBMP* pattern is relevant with the goals of Curriculum 2013.

#### 4. CONCLUSION

1. Lesson studies play a strategic role in drawing a real picture of the implementation of learning syntax about which teachers have understood little.
2. The two learning approaches presented have given valuable experiences to biology teachers unexperienced with their implementation.
3. Lesson studies are really appropriate to model the learning approach about which teachers have understood little in the implementation of Curriculum 2013.

In conclusion, it is necessary to develop school-based lesson studies (*LSBS*) and to encourage participation-based lesson studies by developing teachers' awareness of 'sharpening the saw', loving each other and taking care of each other in order to reinforce pedagogical skills and learning strategies among biology teachers.

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## Strengthening Technological Pedagogical Content Knowledge (Tpck) of Preservice and Inservice Biology Teacher Through Lesson Study

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**Abstract:** Lesson Study in Biology Teachers Forum as a mean to support qualification, should be carried out in accordance with National Education Standards, especially Standards of Content, Process, and Evaluation. The aim of this study was to describe the Technological Pedagogical Content Knowledge (TPCK) of preservice and inservice biology teachers in Pekanbaru, Riau, Indonesia, through Lesson Study. The sample of this study was 22 preservice teachers from Biology Education Program University of Riau and 33 inservice biology teachers from Biology Teachers Forum. This study was conducted based on stages in lesson study, which are plan, do, and see. The focus of this study was preservice and inservice teacher that can apply TPCK. The questionnaire consists of 35 items from 7 subdomains. The subdomains are Technological Knowledge (TK), Pedagogical Knowledge (PK), Content Knowledge (CK), Technological Pedagogical Knowledge (TPK), Technological Content Knowledge (TCK), Pedagogical Content Knowledge (PCK) and Technological Pedagogical Content Knowledge (TPCK). The questionnaire items are valid and reliable. The finding showed that mentoring senior high school preservice and inservice Biology Teacher through Lesson Study: (1) to increase understanding of curriculum and teaching materials, (2) to improve the quality of learning, (3) to increase ability to evaluate and assess learning outcomes, (4) to increase ability in scientific writing and classroom action research. To conclude, the preservice and inservice biology teachers' TPCK was good, which can support to achieve standard of content, process and evaluation biology learning.

**Keywords:** Inservice, preservice teacher, technological pedagogical content knowledge

### 1 INTRODUCTION

Teachers are professional educators with primary tasks of educating, teaching, guiding, directing, training, assessing, and evaluating students of early childhood, primary, and even secondary education. Professional teachers will create a high quality of educational process and outcomes in order to create smart and competitive nation, who are faithful, noble, healthy, knowledgeable, skilled, creative, independent, and becoming responsible and democratic citizens (UU RI No.14 Year 2005). To be a professional teacher, everyone is required to have ability in developing competence within him.

Rapid development of science and information technology in this globalization era has become a challenge for teachers to overcome it by upholding professionalism. With this condition, teachers have to be able to adapt responsively. Responsive means that teachers have to master technology, especially those which are related to education (Kunandar, 2011). Therefore, teachers are not only supposed to develop their pedagogical knowledge or content knowledge, but also technological knowledge so that teaching and learning process can be in accordance with the times.

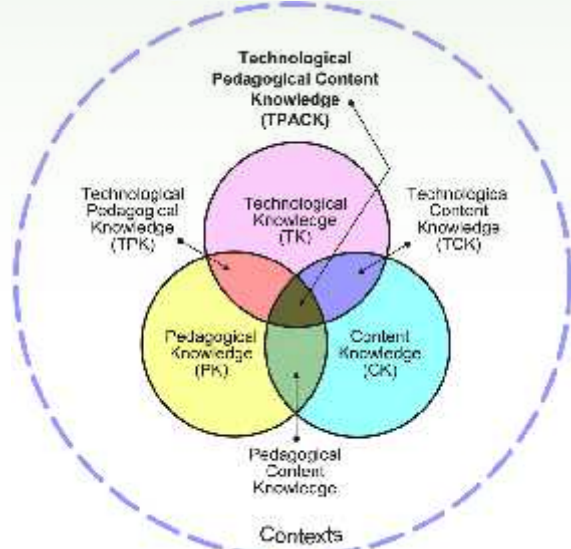
According to Mulyasa (2012), the use of information technology in education is to make learning activity easier and more effective.

Seeing these conditions, an effort is needed to develop teachers' quality and professionalism. Professionalism development can be done through developing knowledge that can support their profession. One of useful knowledge frameworks for developing teachers' competence is *Technological Pedagogical Content Knowledge (TPCK)*.

*Technological Pedagogical Content Knowledge (TPCK)* is a conceptual framework which shows correlation among three kinds of knowledge that should be mastered by teachers, which are technological, pedagogical, and content knowledge. This TPCK have to be mastered by teachers so that the learning process can run effectively and efficiently. TPCK framework is developed by Mishra and Koehler (2006) and is the development from Shulman's (1986) conceptual framework about *Pedagogical Content Knowledge (PCK)*. In general, TPCK comprises of 3 main components, namely content, pedagogic, and technology. The interaction of the 3 components then form 7 knowledge components, which are *technological knowledge (TK)*, *pedagogical*

knowledge (PK), content knowledge (CK), technological pedagogical knowledge (TPK), technological content knowledge (TCK), pedagogical content knowledge (PCK) dan technological pedagogical content knowledge (TPCK), as shown in figure 1.

Figure 1. Framework of *Technological Pedagogical Content Knowledge*



(Source: <http://www.matt-koehler.com>)

Strengthening this TPCK can be done by both preservice and in-service teachers through lesson study. According to Hendayana (2006), lesson study is teachers' professional development model through collaborative and sustainable learning which is based on collegiality and mutual learning principles to build learning community. Widodo (2011) also adds that the main principle of lesson study is gradual improvement of learning quality through learning from his own and other people's experience in doing learning activity.

GPA	2,80	>2,80-3,20	>3,20-3,60	>3,60-4,00
Percentage	0%	9,1%	72,7%	18,2%

## 2 RESEARCH METHODOLOGY

The objects of this study were 22 pre-service Biology teachers from Biology Study Program of Riau University, PGMIPA-U class (Leading Mathematics and Science Teacher Education class) and 33 Biology teachers who joined Biology Teachers Forum of Senior High School in Pekanbaru. The procedure of this research was carried out based on steps in lesson study, which were plan, do, and see. Activity of plan, do, and see upon Biology Teachers Forum of academic year 2012/2013 in Pekanbaru was done in 2 cycles with two subject matters, which were excretion

and coordination system. Activity can be seen in table 1.

Table 1. *Plan, Do, and See* Activity of High School Biology Teacher Forum in Pekanbaru (see APPENDIX )

Activity of plan, do, and see upon the subject of Program Development in Biology Learning by Biology students was conducted in two cycles with two subject matters, which are virus and plant tissues. Activity can be seen in table 2 (see APPENDIX)

Instrument used in this study was questionnaire adapted from Schmidt *et al.* (2009) and Sahin (2011). The questionnaire comprised of 35 items to measure seven domains of TPCK. Result of validity test through Pearson Correlation showed that all item is valid. To test questionnaire reliability through alpha cronbach's test, 0.935 was obtained. The data of this study was analyzed descriptively.

## 3 FINDINGS AND DISCUSSION

### 3.1 Profile of Pre-Service Biology Teachers in Pekanbaru

Based on the collected data, profile of respondents is presented in following tables

Table 3. Profile of Pre-service Teachers based on Score of Several Subjects

No.	Score	Subjects		
		BM	BID	MT
1.	A	54,5%	36,4%	22,7%
2.	A-	0%	50,0%	36,4%
3.	B+	0%	13,6%	40,9%
4.	B	45,5%	0%	0%
5.	B-	0%	0%	0%
6.	C+	0%	0%	0%
7.	C	0%	0%	0%

Notes:

BM: Biomultimedia;

BID: Biology Instructional Design;

MT: MicroTeaching

Table 4. Profile of Preservice Teachers based on GPA

Table 5. Profile of In-service Teachers based on Educational Background

Education	Education Field		Sum
	Biology Education	Pure Biology	
DIII	1 (3,0%)	0 (0,0%)	1 (3,0%)
S1	27 (81,8%)	2 (6,1%)	29 (87,9%)
S2	3 (9,1%)	0 (0,0%)	3 (9,1%)
Sum	31 (93,9%)	2 (6,1%)	33 (100,0%)

Table 6. Profile of Teachers based on Teaching Experience and Certification

Teaching Experience	Certification		Sum
	Done	Not Yet	
10 years	3 (9,1%)	1 (3,0%)	4 (12,1%)
11-20 years	8 (24,2%)	2 (6,1%)	10 (30,3%)
21-30 years	14 (42,4%)	0 (0,0%)	14 (42,4%)
>30 years	5 (15,2%)	0 (0,0%)	5 (15,2%)
<b>Sum</b>	<b>30 (90,9%)</b>	<b>3 (9,1%)</b>	<b>33 (100,0%)</b>

Table 7. Profile of Teachers based on Age, Training, and Computer Course

Age	Training		Computer Course		Sum
	Ever	Never	Ever	Never	
35 years old	0 (0,0%)	2 (6,1%)	2 (6,1%)	0 (0,0%)	2 (6,1%)
36-45 years old	2 (6,1%)	9 (27,3%)	3 (9,1%)	8 (24,2%)	11 (33,3%)
46-55 years old	8 (24,2%)	7 (21,2%)	4 (12,1%)	11 (33,3%)	15 (45,4%)
>55 years old	4 (12,1%)	1 (3,0%)	2 (6,1%)	3 (9,1%)	5 (15,2%)
<b>Sum</b>	<b>14 (42,4%)</b>	<b>19 (57,6%)</b>	<b>11 (33,3%)</b>	<b>22 (66,7%)</b>	<b>33 (100,0%)</b>

As seen in table 3 and 4, pre-service Biology teachers have good record for the three subjects. None of them gets C. In other words, all pre-service Biology teachers graduate with good mark. Likely, for their GPA, none gets GPA less than 2.80. Meanwhile, the respondents from in-service teachers also have sufficient qualification, especially in terms of educational background, teaching experience, and certification. In term of educational background (Table 5), almost all of them meet minimum academic qualification (only 3.0% have not met the qualification) and come from respective field of study. In term of certification (Table 6), most of them (90.9%) have had teaching certificate. Based on these profiles, it implies that both Pre-service and in-service teachers in Pekanbaru have relatively good

qualification. It indicates that both pre-service and in-service teachers will have capability to apply *Technological Pedagogical Content Knowledge (TPCK)*.

### 3.2 TPCK of Pre-Service and In-Service Bioogy Teachers

#### 3.2.1 Technology Knowledge (TK)

*Technological knowledge* is a knowledge about technology in which by having this knowledge will help us to use and learn the technologies available (Jordan, 2011). This is a basic knowledge to utilize and operate various technology products. In case of digital technology, it includes operating system, hardware, and ability to use software, such as word processor, *spreadsheet*, *browser* and *e-mail*.

Based on data analysis, the *TK* profile obtained of pre-service and in-service Biology teachers in Pekanbaru is presented in table 8.

Table 8. *TK* Score of Pre-service and In-service Biology Teachers in Pekanbaru (see APPENDIX)

Mean *TK* score of pre-service Biology teachers in Pekanbaru is at very good criteria (Table 8). It shows that the ability of pre-service Biology teachers in technology is sufficient, especially in using programs and internet. Meanwhile, the mean *TK* score of in-service Biology teachers in Pekanbaru is at enough criteria (Table 8). It implies that teacher's ability in using technology still needs to be developed. The lowest score is on statement of knowing how to overcome computer technical problems with less criteria. It implies that teachers seem to be unable to overcome technical problems, like installing programs, removing programs, and any other technical problems on computer.

The highest mean of both pre-service and in-service Biology teachers have is on the statement of storing data on digital media, with very good criteria. Data and information available nowadays are mostly in form of digital data, thus it requires people to have ability to store these data in digital media, such as *flashdisk*, *CD*, *memory card*, and *DVD*.

Pre-service and in-service Biology teachers in Pekanbaru also have a good awareness to follow the development of available technology. It was considered important, for the technology always develops time to time. Mishra and Koehler (2006) state that as the technology continues to evolve, the technology knowledge also continues to change along with it. Various technologies will inevitably change and may even disappear within the coming years. Therefore, the ability to learn and adapt to new technology is a very important thing.

#### 3.2.2 Pedagogical Knowledge (PK)

*Pedagogical knowledge* is teacher's knowledge about the various implementation, strategies and methods to support students' learning (Koehler et al., 2014). Pedagogical knowledge is in line with pedagogical competence on the UU RI No. 14/2005 about Teachers and Lecturers. Indonesian Government Regulation No. 19/ 2005 explains that pedagogical competence is teacher's ability to manage learning consisting of understanding students, planning, learning implementation, evaluating learning outcomes and actualizing potential of all students.

Based on data analysis, the PK profile obtained of pre-service and in-service biology teachers in Pekanbaru is presented in Table 9.

Table 9. *PK* Score of Pre-service and In-service Biology Teachers in Pekanbaru (see APPENDIX)

Mean PK score of both pre-service and in-service Biology teachers in Pekanbaru is at good criteria (Table 9). It means that both pre-service and in-service Biology teachers in Pekanbaru have already had a good pedagogical knowledge and have been able to implement it in teaching and learning process. However, total PK score of in-service teachers is higher than the score of pre-service teachers, which can be seen in the item of able to manage and control the class well.

Ability to manage and control the class has the highest mean score on the biology teacher, with a very good criteria. This shows that teachers have confidence in managing and controlling the class. According to Margunani and Fatimah (2007), classroom management is one of teacher's primary tasks. Classroom management is intended to create a conducive learning environment for students in order to achieve the objective of effective teaching. Meanwhile, for pre-service teachers, score of the ability to manage the class is the lowest of other items, but has been at good criteria.

The lowest mean obtained from in-service biology teachers is at the item of using various learning strategies, but still at good criteria. Learning strategy mastery is an important part of teachers, especially mastery of learning strategy that emphasizes students to actively seek knowledge independently and takes into account their uniqueness and prior knowledge (Arnyana, 2007)..

This good criteria of pedagogical knowledge of in-service Biology teachers in Pekanbaru is supported by the finding that 93.9% of them are from Biology Education. Having a Teachers Training major as their educational background indeed gives a positive contribution towards their pedagogical competence. Teachers Training major has equipped its graduates with a number of teaching competency, such as pedagogical competence, which is a characteristic of Institute of Educational Personnel (LPTK).

### 3.2.3 Content Knowledge (CK)

Content knowledge is a knowledge of concepts, theories, ideas, organizational frameworks, knowledge of evidence, as well as the practices and approaches to develop such knowledge ( Shulman, 1986).

Based on data analysis, CK profiles obtained of pre-service and in-service Biology teachers in Pekanbaru is presented in Table 10.

Table 10. *CK* Score of Pre-service and In-service Biology Teachers in Pekanbaru (see APPENDIX)

Mean CK score of pre-service Biology teachers in Pekanbaru is at good criteria (Table 10). It implies that these pre-service and in-service teachers already have a good confidence in terms of Biology knowledge. Overall, there is no significant difference among each score from each item except in the item of following seminars or activities related to Biology which has lowest score of all. It implies that participation of pre-service and in-service teachers in activities aimed to develop their knowledge still needs to be improved.

For the item of using latest sources (such as books, journals) to enrich Biology repertoire of pre-service teachers is at very good criteria. It shows that compared to in-service teachers, pre-service teachers are more active in exploring new sources, like books and journals to develop their knowledge. According to Arnyana (2007), teachers must master the teaching materials in their field thoroughly. To be able to do so, teachers must have a habit to browse library and other sources independently.

### 3.2.4 Technological Pedagogical Knowledge (TPK)

*TPK* is a knowledge of how various technologies can be used in teaching and the use of these technologies can change the way teachers teach (Schmidt et al., 2009). Harris et al. (2009) added that TPK in general is a teacher's understanding in order to be able to use the technology for pedagogical purposes.

Based on data analysis, TPK profiles obtained of pre-service and in-service Biology teachers in Pekanbaru is presented in Table 11.

Table 11. *TPK* Score of Pre-service and In-service Biology Teachers in Pekanbaru (see APPENDIX)

Mean TPK score of pre-service Biology teachers in Pekanbaru is at very good criteria, while TPK of in-service teachers is at good criteria (Table 11). Lowest mean obtained from teachers is on item of using internet facility to communicate with students and is at enough criteria. It shows that teachers have not yet using internet facilities to communicate with their students optimally.

According to Yaumi (2011), the use of communication media such as the internet has built a

new model of interaction in learning these days. Interaction between teachers and students is not only done through face-to-face interaction but also performed with the communication media. With this information technology, teachers can provide service without having to deal directly with students.

### 3.2.5 Technological Content Knowledge (TCK)

TCK is a knowledge of the interrelationships between technology and content (Koehler et al., 2014). This knowledge invites teachers to understand that the use of a particular technology can change the way they understand the concept of a particular content (Schmidt et al., 2009).

Based on data analysis, TCK profiles obtained of pre-service and in-service Biology teachers in Pekanbaru is presented in Table 12.

Table 12. *TCK Score* of Pre-service and In-service Biology Teachers in Pekanbaru (see APPENDIX)

Mean TCK score of pre-service and in-service Biology teachers in Pekanbaru is at good criteria (Table 12). It means that pre-service and in-service teachers have been able to integrate technology knowledge and Biology content knowledge. In other words, teachers are already using technology in learning and developing their respective subject. However, the lowest mean is at the item of knowing computer applications related to Biology. It shows that teachers are still lack of knowledge regarding computer application related to Biology. In fact, there are various of such applications. For example, there is a 3D human anatomy (Google Body Browser) to learn anatomy of human body, Geographic Information System (GIS) to learn biodiversity, internet-based Biology Experiment simulator, (<http://phet.colorado.edu>), *virtual lab*, and so on. These applications can be used to help teachers to understand the concepts and application of Biological science. However, based on the findings of the research, Biology teachers in Pekanbaru are limited to use Google search engine only to help them find references in the form of texts or images.

### 3.2.6 Pedagogical Content Knowledge (PCK)

PCK is the prevailing pedagogic knowledge for teaching specific content. This knowledge includes to know what teaching approaches fit the content and also to find out how the content elements can be arranged for better teaching (Mishra and Koehler, 2006). Shulman (1987) argues that PCK also includes the understanding of what makes a particular material is easy or difficult to learn.

Based on data analysis, PCK profiles obtained of pre-service and in-service Biology teachers in Pekanbaru is presented in Table 13.

Table 13. *PCK Score* of Pre-service and In-service Biology Teachers in Pekanbaru (see APPENDIX).

Mean PCK score of pre-service teachers is at good criteria, while score of in-service teachers is at very good criteria (Table 13). It shows that these in-service teachers have applied PCK well, especially in preparing their own lesson plans and in selecting approaches and learning strategies appropriate to the biology material. This shows that the biology teachers in Pekanbaru have already had confidence in designing their own learning by observing the strategy and the characteristics of the material to be taught.

Teachers are supposed to have adequate PCK, because pedagogical knowledge and knowledge itself can not be separated in the learning activities. Savas (2011) argues that it is impossible to teach a subject without content or pedagogical knowledge, as well as to implement pedagogical knowledge without content or subject matter. Therefore, PCK is considered very important to be mastered by the teachers.

### 3.2.7 Technological Pedagogical Content Knowledge (TPCK)

TPCK is a knowledge needed by teachers to integrate technology into the teaching of a particular material. Teachers must have an intuitive understanding of the complex interactions between the three basic components of knowledge, namely PK, CK, and TK, by teaching a particular material using pedagogical methods and appropriate technology (Schmidt et al., 2009). TPCK has advantages over previous concepts, the PCK, such as in developing instructional design, learning models and strategies, assessment system, as well as in curriculum design, in which all of this is integrated with ICT. Thus, TPCK contributes significantly to changes and learning paradigm (Muslim et al., 2012).

Based on data analysis, TPCK profiles obtained of pre-service and in-service Biology teachers in Pekanbaru is presented in Table 14.

Table 14. *TPCK Score* of Pre-service and In-service Biology Teachers in Pekanbaru (see APPENDIX)

Mean TPCK score of pre-service and in-service teachers in Pekanbaru is at good criteria (Table 14). That is, both pre-service and in-service teachers have been able to apply TPCK well. This is particularly noticeable in the item of selecting learning strategies and technology which are relevant to Biology material to be taught in the classroom. This item of the statement has the highest mean and is at very good criteria.

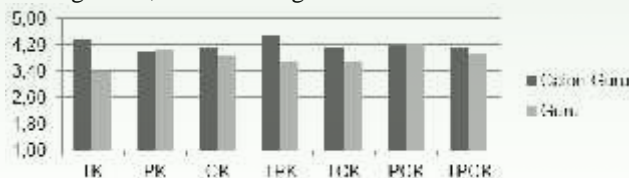
Item of Applying different learning strategies and using varied computer applications in learning Biology has the lowest mean of the other items. It can also be seen in the response of the open questionnaire, in which the teachers generally only utilize Microsoft Powerpoint in biology learning. Varied learning strategies and technology can increase students'

interest that then will have an impact on learning outcomes.

Overall, description of the ability of Pre-service and In-service Biology Teachers in Pekanbaru in applying TPCK is presented in Figure 2 below.

Figure 2. Mean Score of TPCK Sub domain of Pre-service and In-service Biology Teachers in Pekanbaru

In general, based on Figure 2 it can be seen that



the mean of TPCK sub domain of pre-service teachers is better than is the in-service teachers, especially at TK subdomain. This is because generally students are very familiar with technology products. However, there is a mean of TPCK subdomain of pre-service teachers which is lower than in-service teachers, they are at PK and PCK subdomain. It might be due to the teaching experience, in which in-service teachers must have longer teaching experience so that their pedagogical knowledge can be developed adequately. Meanwhile, the pre-service teachers' teaching experience is limited to microteaching, so the development of pedagogical capabilities still needs to be improved.

For respondent teachers, TK subdomain is relatively low compared to the mean of the other subdomains and classified in enough criteria. It is followed by TPK, TCK and TPCK subdomain (Figure 2). It can be concluded that the subdomain that contains elements of the technology is still relatively low compared to the subdomain that does not contain elements of technology. This shows that teachers' competence in the field of technology still needs to be developed.

The factor of age and participation in computer courses are related to technology knowledge of these teachers. At the beginning of the study, the result of interview done towards teachers who are members of Biology Teacher Forum (MGMP) of High School in Pekanbaru showed that age was one of the factors affecting the ability of teachers to master the technology. This is in line with what was found by Kazu and Erten (2014), that there is a significant relationship between age and TK. When getting older, the teacher is usually no longer familiar with the various technologies and their interest in technology is also declining.

Subdomain which has the highest mean score is PCK and it is classified in very good criteria. This is followed by PK and CK subdomain with good criteria. This shows that Biology teachers in Pekanbaru already have confidence in pedagogical competence and have a good mastery of Biology materials. One of supporting factors is the latest education of these

teachers, in which around 97.0 % already meet the minimum academic qualification and even of 11.1 % has had master's degree. Furthermore, around 93.9 % of teachers are those whose educational background is Biology Education, of which it is becoming one of the factors that strongly support the pedagogic competence and mastery of the biology teachers. The rest, as much as 6.1 % of teachers have the

educational background of Biology (non-education) and none has come from outside the field of respective subjects. In other words, the overall Biology teachers in Pekanbaru have adequate and appropriate competence in term of the respective subject.

In general, the ability of the biology teachers in Pekanbaru in applying TPCK is at good criteria. It is presumed so based on educational background, certification and teaching experience of the teachers, which are in general at good qualifications. In terms of educational background, most biology teachers in Pekanbaru are already highly qualified and also none comes from outside the education field of respective subject, namely the biological sciences.

Furthermore, in term of the certification, 90.9 % of teachers claimed to have passed the certification. Professional teacher is an absolute requirement to create high quality of education systems and practices. Mulyasa (2012) states that one of the indicators of teacher certification standards is a teacher mastery of the competency standards in field of learning technology.

Teaching experience is also one of factors that contributes to the ability of teachers in applying TPCK. Most of biology teacher in Pekanbaru (57.6 %) have the experience of teaching for more than 20 years. Hosseini and Kamal (2013) found that there is a significant effect of teaching experience to TPCK. The longer the teaching experience, the higher the TPCK they have.

In the TPCK framework, teachers are not only required to develop pedagogical knowledge or content knowledge, but they are also required to find out how to present the subject matter with the appropriate teaching and learning strategy and is able to utilize the technology so that the learning activity can run effectively and efficiently. In the 2013 curriculum, each subject teachers are also required to integrate ICT in every lesson. In addition, Muslims et al. (2012) argue that TPCK framework is also in line with the demands of 21st century learning in which the mastery of ICT to be a prerequisite for teachers.

TPCK that a teacher has is also expected to be developed continuously in order to accelerate the



achievement of the National Education Standards, especially for Standard of Process, Content and Evaluation. Standard of Process, as stipulated in the Regulation of the Indonesian Minister of Education and Culture of the Indonesia No. 65/2013, includes planning the learning process, the implementation of the learning process, as well as evaluating the learning process to improve the efficiency and effectiveness of the achievement of the competence of graduates. To improve the efficiency and effectiveness of learning, we need to use ICT. Ingram (in Cholis Sadijah, 2009) states that by using ICT, learners can immediately focus on learning. Thus, teachers can use more time to facilitate and discuss with learners because generally, ICT-assisted learning has been prepared well in advance.

#### 4 CONCLUSIONS

Overall, it is known that TPCK of pre-service and in-service Biology teachers in Pekanbaru is at good criteria. Thus, they have been able to organize ICT-based learning which will create an effective and efficient learning for the fulfillment of the National Education Standards, especially in terms of standards of content, process and evaluation.

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APPENDIX

Table 1. *Plan, Do, and See* Activity of High School Biology Teacher Forum in Pekanbaru

Activity	Day/Date	Venue	Participant	Material
Plan 1	Thursday, 24 January 2013	SMAN 8 Bio Lab	Team of Assistants, Model Teacher, Biology Teacher	Discussion of 1 <sup>st</sup> Learning Instruction Development
Do (open class)	Thursday, 7 February 2013	SMAN 8 Bio Lab	Team of Assistants, Model Teacher, Observers, Biology Teacher and Teachers of other Subjects	Coordination System
See				
Plan 2	Thursday, 21 February 2013	SMAN 8	Team of Assistants, Model Teacher, Biology Teacher	Discussion of 2 <sup>nd</sup> Learning Instruction Development
Do (open class)	Thursday 28 February 2013	SMAN 9	Team of Assistants, Model Teacher, Observers, Biology Teacher and Teachers of other Subjects	Excretion System
See				
FGD	Thursday, 25 April 2013	SMAN 8	1 <sup>st</sup> Dean Assistant of FKIP, Head of UPTPPTK Riau, Head of Dikmen Disdik Division, SMAN 8 Principle, Team of Assisstants, Member of Biology Teacher Forum	Reflection and Follow Up

Table 2. *Plan, Do dan See* Activity of Pre-service Biology Teachers

Activity	Day/Date	Venue	Participant	Material
Plan 1	Thursday, 7 November 2013	Bio Lab	22 Participants	Discussion of 1 <sup>st</sup> Learning Instruction Development
Do (open class)	Saturday, 9 November 2013	Room F01	22 Participants	Virus
See				
Plan 2	Thursday, 14 November 2013	Bio Lab	22 Participants	Discussion of 2 <sup>nd</sup> Learning Instruction Development
Do (open class)	Saturday, 16 November 2013	Room F01	22 Participants	Plant Tissues
See				
FGD	Saturday, 23 November 2013	Bio Lab	22 Participants	Reflection and Follow Up

Table 8. *TK* Score of Pre-service and In-service Biology Teachers in Pekanbaru

No.	Items of Statement	Pre-Service Teachers		In-service Teachers	
		Mean	Remark	Mean	Remark

1.	Knowing how to overcome computer technical problems	3,91	Good	2,30	Less
2.	Easy to learn using technology	4,27	Very Good	3,06	Enough
3.	Following the development of latest technology	4,23	Very Good	3,55	Good
4.	Understanding the basic components of a computer	4,00	Good	3,03	Enough
5.	Proficient in using word processing program	4,64	Very Good	3,67	Good
6.	Proficient in using <i>spreadsheet</i>	4,41	Very Good	3,30	Enough
7.	Proficient in using presentation program	4,68	Very Good	3,70	Good
8.	Proficient in using <i>printer, scanner, projector</i> dan <i>digital camera</i>	4,27	Very Good	3,39	Enough
9.	Storing data on digital media	4,77	Very Good	4,30	Very Good
10.	Using internet as a communication medium	4,59	Very Good	3,73	Good
Total		4,38	Very Good	3.38	Enough

Table 9. *PK* Score of Pre-service and In-service Biology Teachers in Pekanbaru

No.	Item of Statement	Preservice Teachers		Inservice Teachers	
		Mean	Remark	Mean	Remark
1.	Having knowledge in assessing students' performance in the class	4,00	Good	4,18	Good
2.	Using various assessment methods and techniques	4,14	Good	4,00	Good
3.	Implementing various learning strategies	4,14	Good	3,82	Good
4.	Recognizing possibility of students' misconception and learning difficulties	3,91	Good	4,09	Good
5.	Able to manage and control the class well	3,77	Good	4,21	Very Good
6.	Doing reflective action to improve learning quality	3,91	Good	4,00	Good
Total		3,98	Good	4,05	Good

Table 10. *CK* Score of Pre-service and In-service Biology Teachers in Pekanbaru

No.	Item of Statement	Pre-service Teachers		In-service Teachers	
		Mean	Remark	Mean	Remark
1.	Understanding biology concepts, laws, and theories as well as its application in flexible way	4,00	Good	4,03	Good
2.	Knowing the history and development of science, especially Biology	4,09	Good	4,06	Good
3.	Designing and carrying out Biology experiment for teaching or research purpose	4,00	Good	4,00	Good
4.	Using the latest sources (such as books, journals) to add the Biology repertoire	4,59	Very Good	4,00	Good
5.	Following seminars or activities related to Biology	3,77	Good	3,52	Good
Total		4,09	Good	3,92	Good

Table 11. *TPK* Score of Pre-service and In-service Biology Teachers in Pekanbaru

No.	Item of statement	Pre-service Teachers		In-service Teachers	
		Mean	Remark	Mean	Remark
1.	Using computer application in learning	4,64	Very Good	3,88	Good

2.	Choosing technology which is appropriate with approaches and learning strategy in my class	4,27	Very Good	3,82	Good
3.	Using internet facilities (such as social media, blog) to communicate with students	4,64	Very Good	3,39	Enough
Total		4,52	Very Good	3,70	Good

Table 12. *TCK Score* of Pre-service and In-service Biology Teachers in Pekanbaru

No.	Item of Statements	Pre-service Teachers		In-service Teachers	
		Mean	Remark	Mean	Remark
1.	Using technology to help to understand Biology concepts, laws, and theories	4,68	Very Good	3,94	Good
2.	Knowing computer applications related to Biology	3,64	Good	3,24	Enough
3.	Developing students' activities and tasks that is involving the use of technology	4,14	Good	3,91	Good
Total		4,15	Good	3,70	Good

Table 13. *PCK Score* of Pre-service and In-service Biology Teachers in Pekanbaru

No.	Item of Statement	Pre-service Teachers		In-service Teachers	
		Mean	Remark	Mean	Remark
1.	Selecting approaches and learning strategies which are appropriate with the material	4,27	Very Good	4,39	Very Good
2.	Preparing my own lesson plan	4,45	Very Good	4,45	Very Good
3.	Able to make difficult material be easy to be understood by students	3,64	Good	4,12	Good
4.	Making my own questions to measure students' understanding about the material	4,36	Very Good	4,06	Good
Total		4,18	Good	4,26	Very Good

Table 14. *TPCK Score* of Pre-service and In-service Biology Teachers in Pekanbaru

No.	Item of Statements	Pre-service Teachers		In-service Teachers	
		Mean	Remark	Mean	Remark
1.	Selecting learning strategies and technology which are relevant to Biology material to be taught	4,27	Very Good	4,24	Very Good
2.	Integrating Biology knowledge, pedagogical knowledge, and technology knowledge to create effective learning	4,18	Good	4,15	Good
3.	Helping my colleagues to understand how to integrate Biology knowledge, pedagogical knowledge, and technology knowledge	4,00	Good	3,76	Good
4.	Applying different learning strategies and using varied computer applications in learning Biology	4,05	Good	3,61	Good
Total		4,13	Good	3,94	Good

**Title: Reflections of the Teacher Implementers**  
**Types of Paper: Research Paper**  
**Strand: Issues about Leading Lesson and Learning Study**

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**Abstract** :Lesson Study of 2014 in Brunei Darussalam focuses on Year 1 and Year 4 primary mathematics and there are 12 schools involve with this lesson study project. In Brunei Darussalam, lesson study for primary mathematics has been carried out, in small and big scale, since 2009. One of the components in the project is teacher reflection. This important exercise for teacher implementers requires them to reflect on their own teaching so that they can develop awareness and learn to think and reflect on their classroom practices. Furthermore, it hopes to help teachers to improve their classroom practices in the next cycle of lesson implementation. Four questions were asked to help the teacher implementers to focus their reflections, namely, how do they feel about their lesson, what their students have learned, which tasks or activities were most or least successful and what are their consideration for the next lesson. The nature and common themes in these reflections will be further explored in this study.

**Keywords:** Reflection; Lesson Study; Primary Mathematics

**1 INTRODUCTION**

In Brunei Darussalam, Lesson Study for primary mathematics has been carried out, in small and big scale, since 2008. Lesson Study is in fact under literacy and numeracy initiatives, one of the Ministry of Education’s grand initiatives in realising the vision of ‘Quality Education towards a Developed, Peaceful and Prosperous Nation’. In 2014, there are 12 government schools involved in this Lesson Study project and one of the components in this project is teacher reflection. This important exercise for teacher implementers requires them to reflect on their teaching so they can engage in reflective practice in order to develop awareness and learn to think and reflect on their classroom practices. Furthermore, it hopes to help teachers to improve their classroom

practices in the next cycle of lesson implementation.

**2 LITERATUR REVIEW**

In Lesson Study, one component for teacher professional development is the reflection of teachers on their instructional strategies. This is because in Lesson Study, the lessons are reiterated in few cycles and reflection is crucial between each cycle to develop a more effective lesson. Thus the main objective for teachers to exercise reflective thinking is to develop their professional growth in terms of reasoning of their practiced instructional strategies and their success on pupils’ learning outcomes.

A reflective professional invests time in thinking through his own actions and judgement in his professional work. He thinks back at a difficult situation in the classroom and looks at the situation from a variety of angles. He engages other teachers in discussing practical issues and generates knowledge and insights into everyday problem (Ng P.T, 2005). One way to cultivate

teacher’s reflective thinking is through thinking out loud what they think and write their thoughts in terms of journal writing.

In this study, researchers will study the components of reflection done by the teachers. The study will based the components on Lee (2000 & 2005) model that includes attitudes, process, content and depth.

The criteria to assess the depth of reflective thinking are as follows:



Recall level (R1): one describes what they experienced, interprets the situation based on recalling their experiences without looking for alternative explanations, and attempts to imitate ways that they have observed or were taught.

- Rationalization level (R2): one looks for relationships between pieces of their experiences, interprets the situation with rationale, searches for “why it was”, and generalizes their experiences or comes up with guiding principles.
- Reflectivity level (R3): one approaches their experiences with the intention of changing/improving in the future, analyzes their experiences from various perspectives, and is able to see the influence of their cooperating teachers on their students’ values/behaviour/achievement. (Lee, 2005, p 703)

### 3 METHODOLOGY

The Lesson Study program has been implemented in Brunei Darussalam since 2008. Teachers involved are yearly briefed on what is required of them to present towards the end of the year to the Ministry of Education.

They are guided throughout the year, monitored and given feedback for further improving their pedagogical skills. For purpose of this study, a total of 9 teachers from year 1 and year 4 had participated. The samples selected were those who have been actively involved as the implementers of Lesson Study as well as the pioneer in this program, hence purposive sampling was applied in this study. They were regarded to be well acquainted with the system of Lesson Study. All the participants were given a list of checklist on what to include in their reflections. They were asked to document their reflections of their lessons in the form of a journal. It consisted of 4 main areas encompassing their affection of their lessons, the knowledge gained by their students out of the lesson, the most and least successful activities conducted in class and what would they do differently to make the lesson become more effective. The documented journals are used by the researchers to gauge how far the implementers had reflected on their classroom practices. In this study, a total of 18 artefacts were obtained from the implementers. Based on the instruments used to collect the data, this study was more qualitative in nature as there it will be organised by using thematic analysis: looking at the patterns, themes, categories and regularities (Cohen, L et al., 2007)

This study involves 9 mathematics teachers teaching Year 1 and Year 4 of which 4 of them have less than 10 years teaching experience and the rest have more than 10 years of teaching experience. The teachers have different highest qualification ranging from A’Levels, Diploma in Primary Education, and Bachelor of Arts in Primary Education. A teacher may have more than 1 journals submitted.

### 4 LIMITATION

Based on researchers experience with the teachers on getting their reflections, only 9 out of 24 teachers wrote their reflections. Thus teachers seemed reluctant to share their reflections. Dewey (1958) suggested that teachers must be open-minded, responsible and wholehearted in the sense that teachers need to see things at different perspective, taking into account any consequences for their actions which can impact their students personally, intellectually and socially, and being committed to it wholeheartedly. Furthermore written reflections assumed to be difficult. This is because during post lesson interview, the teachers could express their thoughts better.

## Findings

From the data analysis that we have gathered, reflection journal contents consist more on recall than rationalization and reflectivity as shown in Table 1 below.

Participants	Journals	Frequency of recall	Frequency of rationalization	Frequency of reflectivity
9	18	18	13	16

Table 1: Teachers and frequency of different depth on reflective thinking

### *Recall*

Most teachers stated that they have achieved the lesson objectives. But it does not reflect much on the Lesson Study theme itself which should focus more on developing the four main skills; thinking, communication, problem solving and reasoning skills.

Example

Teacher A: Overall of my lesson, about 60% of my lesson objectives are achieve

Teacher B: For me, the lesson still went well and my objectives were achieved. Teacher E:

During this lesson, the objectives have been achieved.

### *Students Behaviour*

Teachers described students affective domain in terms of feelings, emotions and attitudes that they have observed during the lesson.

Example:

Teacher C: During the group work activity, pupils were very cooperative to each other. Pupils like colourful objects/pictures.

Teacher D: Pupils like the fishing shape games.

Teacher H: Pupils were happy to use different types of multiplication method in solving the problem.

### *Students Knowledge*

Teachers interpreted and described what their students have learnt in the lesson based from what they have observed.

Example:

Teacher A: My pupils are able to understand the concept of adding the numbers without regrouping.

Teacher C: Pupils are able to match the shapes to the correct pictures. For the time being, pupils were able to see and tell the name of the shapes immediately by showing the objects. Teacher E: They can find the answer in three ways that was bar model, repeated addition or column method.

### *Teachers' Pedagogical Knowledge*

Teachers explained how they deliver the lesson by recalling back on their experiences. Example:

Teacher A: The video showed to the pupils on addition was very clear and make pupils understand the concept better.

Teacher B: By using concrete materials the pupils were so excited to participate.

Teacher C: When I showed concrete objects to pupils, they could see the shapes immediately. I showed them the name of the shapes on a card and stick it on the board. Pupils can see it clearly and read it out with teacher

### *Classroom Management*

Class control and time management were main issues and concerns experienced by teachers. Example:  
Teacher A: I managed to handle my lesson but unable to control the class as they were very active and playful.

Teacher H: I didn't have enough time for a proper plenary at the end. Most pupils worked well during the group activity but some were off task, playing with the teaching aids.

### *Rationalization*

There is not much on rationalization done by teachers when reflecting on their lessons. They focused more on these two components; students behaviours during the lesson activity and students knowledge through the lesson activity.

### *Students behaviours during the lesson activity*

Teachers described students affective domain and interprets with rationale of why such behaviours shown during the lesson.

Example:

Teacher B: Pupils really enjoyed doing the group activity. I use a real picture for every problem.

Teacher D: Only 1 group need to practice more guided practice because they are not working together during the activity.

Teacher F: I tried ask/pose open ended questions so that the pupils active in giving response instead of close ended responses.

### *Students knowledge through the lesson activity*

Teachers explained only on procedural knowledge. It does not extend to conceptual knowledge in which there is no explanation on the mathematical processes on how the students were able to do it.

Example:

Teacher A: Pupils easily get ideas on how to add the numbers using the counters.

Teacher D: They make many mistakes in independent practice because they are asked to draw the base 10 blocks and subtract by cancelling.

Teacher G: My pupils had learnt a lot from this lesson. They showed varieties of methods to solve the multiplication problem and they willingly presented their ideas with others.

### *Reflectivity*

Based on the transcripts, teachers mostly reflected on their classroom management in terms of class control and time management.

Example:

Teacher A: I would like to improve my class control.

Teacher E: I will change the members of the group so they can work as teamwork. Teacher F: Time management needs improvement.

Teacher H: I will manage my time properly in the future and prepare extension sheet for pupils who have finished their work early.

Teachers also reflect on their pedagogical content knowledge such as improving their questioning techniques, more concrete materials, give clear and simple instructions.

Example:

Teacher A: I would like to improve on my questioning techniques.

Teacher B: I would give a clear and simple instruction during the group activity. I would try to give them more useful material that they can use together.

Teacher E: I will give them more challenging questions for group activity.

Teacher F: Improve on questioning techniques, pose open-ended question. I need to practice more on posing effective question so that my pupils able to communicate effectively, allow them to think and improve their problem solving skills.



## 5 DISCUSSION

Based on the findings, teachers recall on students behaviours, students’ knowledge, their pedagogical content knowledge and classroom management; rationalised more on the lesson’s tasks activities; and deep reflection on classroom management and pedagogical content knowledge such as improving their questioning techniques, more concrete materials, give clear and simple instructions. Teachers’ rationalisation thinking was only focused on the procedural knowledge of the students. Focusing teachers’ professional development towards having an understanding of children’s mathematical thinking promotes teachers to teach concepts and problem solving rather than procedural skills to the students (Fennema et al.,1996). Reflectivity was done mostly on their instructional presentations. Most teachers concern with the changes to be made to their instructional practices such as classroom management and pedagogy. Nothing specific was mentioned on the lesson tasks or the cognitive aspect towards children’s learning.

Based on the forms and functions of teachers reflections (Danielowich, 2007) originally based on Van Manen’s Level of Reflectivity, the reflections done by the teachers are still at technical level of reflection. Although the depth of teachers reflection ranging from recall to reflectivity but the content of the reflections very much on “teacher management of time, space and students behaviours in classroom, content and proses of lesson structure.”

Teachers practising technical reflections would change the means of teaching just to reach the given learning outcomes defined by authorities in

education. In order to go beyond these limitations, teachers are encouraged to reflect interpretively by focusing on students’ learning needs and balance it with the nation’s prescribed curriculum.

## 6 RECCOMENDATION

Teachers need training and practice in articulating their thoughts and feelings. In this case, teacher should be given different opportunities to reflect and think critically through different range of activities. As Thomas (2004) mentioned in his book that one of the components of ‘The Farell Model of reflective practice’ suggests that teachers can engage in a range of activities that facilitates reflection such as through group discussions, classroom observations and journal writing. Thomas (2004) also added that reflective teachers have choices, and reflection is only half of the equation; the other half is action. Once teachers come to understand the how and why of what they do and have done, they can then take steps that will carry them along the path to better teaching.

Justification on reflections is required for teachers to change the way they evaluate their lesson, making it a real reflection instead of comments. Smyth (1987) proposed some series of questions for teachers to think when doing reflection; What do I do as a teacher? What does this mean to me? How did I come to be this way? How might I do things differently? These set of question will give opportunity to teachers to reflect on their theories, values and beliefs that constitutes good teaching which will make them aware of what they need to do to improve and meet the school’s standards.

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## 10’M AKSARA MOVING ON

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**Abstract:** The main focus for this lesson study was to explore ways of leveraging on Information and Communication Technologies (ICT) (i.e. 10’M platform) to improve Primary 1 students’ writing skills in sentence construction. The first lesson plan was carefully crafted through setting meaningful and thinking questions pitched at the students’ level. During the post-conference, it was articulated that the pedagogical structure of the 10’M programme was not applied. The programme required 50% of teacher teaching time and 50% of student-centred activity. Suggestions to include rubric and peer evaluation, assign different ability tasks for students were made to further enhance the second lesson. These refinements were made to ensure self-directed learning and collaborative learning. A refined lesson plan was drawn up looking into discussion via blog and providing differentiated tasks for the different ability group, henceforth maximised the use of 10’M platform. All the students benefited from the second lesson plan. A comparison of results showed that the lower ability and middle ability group students’ command of language in terms of vocabulary exposure were greatly enhanced. The higher ability group were also able to write better in the second lesson. Therefore, 10’M programme is an effective platform to support the teaching and learning of writing for students.

**Keywords:** ICT, writing skills, blog, rubric, peer evaluation, differentiated, real time

### 1 INTRODUCTION

The origin of ‘Lesson Study’ was from Japan where is more common known as “*jugyokenkyuu*”. Lesson study is a process where teachers engage in professional conversations to continually improve the quality of the experiences they provide for their students. Teachers think about their students and identify important gaps between the aspirations they have for them and the results that they are actually achieving (Makoto Yoshida). The process of studying deeply into the issues revolving around a lesson plan will help a team of teachers to improve their teaching through collaborative efforts. It is with such aim that a lesson study team was formed in St Anthony’s Primary School since 2013.

The team consisted of 2 Malay Language teachers who were teaching both the upper and lower primary students. The lesson study mentor, Educational Technology Department (ETD) Officer Dr Suryani Atan, briefed the team members of their roles and what was expected in a lesson study and acted as the knowledgeable other in giving guidance to the lesson study team on issues related to professional practices.

### 2 PROBLEM IDENTIFICATION

Based on the Malay department End of Year Review in 2012, the department found that students were unable to construct grammatically correct sentences. A lack of necessary vocabularies and influence of English Language sentence structure were identified as the root causes for this concern. As such, the department would like to resolve this issue by developing the writing skills early among primary 1 students.

### 3 RESEARCH AND IMPLEMENTATION

The decision to leverage on ICT was based on the remarks made by Ms Ho Peng, Director-General of Education and Chair of the Mother Tongue Language Review Committee. She noted that ICT will play an increasingly larger role in the teaching and learning of mother tongue languages (Koh, 2010). “Children in fact connect very readily and easily with ICT. So,

I think in terms of teaching and learning in the classroom, we really need to use ICT to engage the next generation,” said Ms Ho.

10’M Aksara is an online portal specially designed by ETD for schools to leverage on in the teaching and learning of Malay Language. The features of the 10’M portal include provision of reading passages and inclusion of discussion and evaluation platform which are found suitable to enhance the learning of the students. These affordances of an array of ICT tools also enable group work and collaboration with peers in an online learning environment. However, 10’M Aksara is not just a portal. It is a complete programme that includes professional development of the teachers and a pedagogical structure that promotes 50% teacher teaching time and 50% student-centred time.

Putting fluency first requires that we allow our students to ease into new, unfamiliar forms. It means offering students many opportunities to read examples of the forms they will eventually write (Dawn Latta Kirby and Darren Crovitz, 2013). Providing many reading passages for the students will enable them to model the grammatically correct sentences found in the passage. This helps students to recognise the correct sentence structure. 10’M Aksara provides readily crafted passages pitched at the different level. These passages come with beautiful illustration to excite the young readers. New vocabularies found in the passages provide more model sentences for students to consolidate and enhance understanding on the correct usage of vocab. It also allows ample time for online reading and self-construction of knowledge.

After reading the passage, students were encouraged to give their thoughts and opinions on the passage read (the characters, the ending and etc). Students are able to utilise the blog in the 10’M portal for online discussions with peers and teacher. As students engaged themselves through online conversation, this enhanced their confidence in typing their thoughts and putting it into words. Thinking in group encouraged students to communicate effectively as independent learner and it allows for collaborative learning. All these features on 10’M Aksara provide many varied forms of language input and chances for students to practice before they start writing.

After much scaffolding was done, students were asked to type their sentences online using the given word. Submission of tasks online as well as peer and teacher’s feedback provided room for immediate response in real time between students and teacher.

With the many features available on 10’M portal, it is thus a great ICT tool for teachers to leverage on in the teaching and learning of language.

#### **4 STAGES OF LESSON STUDY JOURNEY**

The following are the stages in a lesson study cycle the team members went through:

- 1) Planning
  - Discussed with ETD officer, Dr Suryani Atan
  - Trained students on how to use 10’M portal in Term 1
  - Drew up first lesson plan
  - Refined lesson Plan with inputs from teacher observers and ETD officers
- 2) First lesson cycle.
- 3) First lesson post-observation conference.
  - Refined lesson plan based on inputs from post-observation conference
- 4) Second lesson cycle.
- 5) Second lesson post-observation conference.
  - Analysed result and consolidated learning.
- 6) Analysis of Data
- 7) Reflection of lesson study cycle by team members
- 8) Generating the report
- 9) Planning the next steps

#### **5 PLANING**

The team took into consideration several factors listed below when crafting the lesson plan.

Lesson study would only begin in Term 2 as students had just entered the primary education and they needed time to adjust to the school system. As the Primary One class comprised of students with mixed ability and they were new to 10’M Aksara portal, teacher must not set too many tasks in one lesson. Teacher would make use of features of 10’M portal eg; reading passages resources, rubrics and evaluation to promote self-directed and collaborative learning. The lesson plan should be carefully crafted with meaningful and thinking questions, pitched at different levels to provide students with different ability with a sense of achievement.

The class was divided into ‘higher ability’ group, ‘middle ability’ group and the ‘low ability’ group. This was done to facilitate teachers who came into the lesson as ‘observers’ for focus observation on the thinking processes of the different ability-groups. Seating arrangement plan of the three ability groups for the class were drawn up and shared with the observers so that they could attached

themselves to a particular group for the observation lesson.

## 6 POST OBSERVATION CONFERENCE ON THE FIRST LESSON CARRIED OUT

The team made the following observation of the first lesson conducted. Teacher used songs to introduce adjectives aroused students' interest thus enticed students' active participation.

On the other hand, in the lesson, students used only 1 tool in the portal for typing their sentences. They did not use the other features found in the portal to do peer checking and peers evaluation. The team also observed that students needed more scaffolding on adjectives used to describe a person. Students do not have enough time to gather more information about their friends before organizing their thoughts. Based on these points raised, the lesson plan for the second lesson was revised.

### Refinements of lessons include the following:

1. The instructional objectives were re-written to make them clearer.
2. More model sentences would be provided and discussed to enable students to understand what was expected in the written assignment.
3. Teacher would assign differentiated tasks for students. That implied designing more guided activities for the LA group and encouraging more students from the LA and MA to ask questions to clarify queries.
4. E-book in the 10'M Aksara portal would be assigned to provide student with more vocabulary and reading at their own pace.
5. Simple rubrics would be uploaded for peer evaluation in next lesson.
6. Lesson to include use of the other tools available in the 10'M portal: rubrics, evaluation and reading material.
7. Blog in the portal would be used for group discussion prior to the lesson.
8. Teacher needed to point out mistakes such as spelling errors and punctuation during class discussion.
9. Time management could be improved by not planning too many activities for each lesson and plan with the aim to maximise the use of the portal.

## 7 POST OBSERVATION CONFERENCE ON THE SECOND LESSON CARRIED OUT

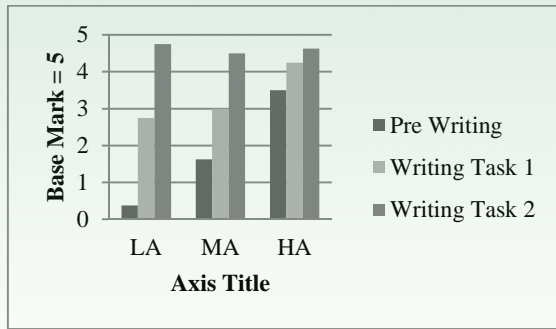
A much better lesson was conducted taking into consideration points mentioned above. For the second cycle, the lesson were able to achieved the 10'M programme requirement of 50% student centred activity and 50% teacher teaching time. Additional tools in 10'M Aksara and appropriate differentiated tasks were assigned. Group discussions were carried out where students identified mistakes made in sentences. Students were able to complete their tasks on time as they were more familiar with the array of tools available on 10'M Aksara. Lesson objectives were met. Students enjoyed the lesson and looked forward for such lesson in future. However, there were still rooms for improvement.

### Refinements of lessons include the following:

1. Instead of assigning written assignment using Grammar tool in the portal, teacher should use the writing tool in 10'M Aksara as the writing tool has editing functions that enable students to correct their mistakes after receiving feedback from teacher and peers.
2. Students still lacked confident in using blog. More opportunities would be provided for students to use the blog tool in future class discussions.
3. Higher ability student lacked the concept on 5W1H in elaborating the writing content. More scaffolding would be needed in future lessons.

## 8 RESULT ANALYSIS

The results from the Primary 1 Malay students were collated and analysed. The summary was put together as a report.



### Lower Ability Students

Lower ability group comprised of 4 students. In the first lesson, students were not able to construct proper sentences hence in second lesson, tasks was simplified to suit their ability. Students were only required to fill in the blanks by selecting the appropriate vocabulary to fit the sentence structure. After the second lesson, students were able to construct at least two simple sentences using the vocabulary taught to them earlier.

### Middle Ability Students

Middle-ability group comprises of 4 students as well. After the first lesson students were able to construct 3 simple sentences. They were able to use some of the vocab taught earlier in the lesson. However, they were still weak in using affixes. After the second lesson, students have been exposed to many model sentences hence they have better grasp on the sentence structure. They improved on their grammar component especially on affixes. They were able to write more grammatically correct sentences within the time given.

### Higher Ability Students

Higher-ability group comprises of the other 4 students. Unlike the LA and MA group, students were assigned to construct five sentences based on the guided questions. Students were able to construct simple grammatically correct sentences but lacked the confidence to use better vocab in their sentences. After more practices and scaffolding, students performed better after second lesson. They were able to write at least three complex sentences using most of the vocab taught earlier. They were also able to write their sentences in appropriate sequence to form a story.

## 9 REFLECTION OF ALL LESSON STUDY MEMBERS

All team members wrote personal reflections on the Lesson Study Journey. All agreed that it had been a most meaningful learning for the student. We also agreed that vocabulary and understanding basic sentence structure are very important in expressing thoughts and feelings, contributing ideas and relating a story through writing. All teachers had an enriching journey.

## 10 WHERE DO WE GO FROM HERE?

The team is ready to embark on a new Lesson Study on Comprehension Skills and collaborative work planned for the students. Better questioning from the students could also be encouraged to make them be more involved in critical thinking and be an independent thinker.

## 11 CONCLUSION

The Lesson Study carried out was one of the highlights of the roles of teachers as researchers in the classroom. It was a refreshing change of role which allows in-depth sharing and collaborating of Malay teachers with ETD officers. It is with the common expectations and goals of the lesson in mind that we come up with meaningful activities to improve the learning of the students. It has been a meaningful journey that also helped us to become more effective teachers in delivering quality education.

## 12 ACKNOWLEDGEMENT

Many people have directly or indirectly contributed to the success of this Lesson Study Journey. First, we would like to express our appreciation for the support of our school leaders, Ms Christina Teo, Mdm Cheryl Teo and Mr Jeffrey Aw. We were selected to share on our insights on the findings of the lesson study conducted. We were given the opportunity to showcase 10'M lesson study journey at the 10'M Seminar in 2013 and Lasallian Learning Fest in June, 2014.

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## Innovative Learning for Entrepreneurship Using Lesson Study for Vocational School

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**Abstract:** One the purpose of Vocational High School is to create the new entrepreneur, meanwhile the teacher in vocational school mostly focus in how to prepare the graduate as a labor. The entrepreneurship subject only as one of the subject in theory not in practical. The other side the student also lack in motivation to be entrepreneur. The preparation for this subject also have many problems such, the materials, the competence of the teacher and also the equipment. Through the lesson study the group of the teacher will be drive to prepare the equipment of learning (syllabus, Lesson Plan, Modul etc). This article has objective to design the group of teacher to make equipment of learning and also to practice it. Using the observation and FGD the design will be provided. The design has some function for the entrepreneur teacher such as preparation the material, have experience to practice, and make a model entrepreneur teacher

**Keywords:** Lesson Study, Vocational High Scholl, Entrepreneur

### 1 INTRODUCTION

The histories tells that if the small entrepreneur having a middle society class which is claimed by some countries, the entrepreneur had contributes a big support to the countries economic growth. The role of small entrepreneur in the economy growth are: (1) fastest economic growth process, like in Japan; (2) work field creation in America since second world war (D.L Birch; 1979 in Widiyanto, 2008<sup>i</sup>). In Indonesia small entrepreneur plays a greater role, in such a way that small entrepreneur was able to provide 99 % job opportunities, in real case small entrepreneur had absorb 63,57% of the unemployment people and only 36,43 % were taken by big industry (Widiyanto, 2008)<sup>ii</sup>.

SMK is the vocational school in senior high school level have three objectives for the graduate i. e: becoming a competence worker, and also a successful entrepreneur, and preparing the student to pursue in university studies (Depdikbud, 1997).<sup>iii</sup> problems remained in the present reveals that in the year 2013 only few graduates join in entrepreneurship and only 25% of which represent a graduates from SMK who wants to be a entrepreneur (Widiyanto, 2010)<sup>iv</sup>.

There are many challenge for the teacher in teaching entrepreneurship, the following are: (1) the lack of entrepreneurship experience; (2) there is no ready book in entrepreneurship as a material, especially material which covers theory and practice; (3) the motivation of the student in entrepreneurship learning is weak; (4) there is no best practice learning

models for entrepreneurship education; (5) entrepreneurship is a character education and implanting the character is a hard effort. (Widiyanto: Yulianto, Arief., 2013)<sup>v</sup>

The problem in teaching entrepreneurship character not only because of teacher is not has person who able be modeled as a idol. For fill the lack of idol teacher who able to be used as a model so the teacher need using Lesson study. As mention by Ibrahim (2010) <sup>vi</sup> Lesson study is a model of coaching profession through study of educator learning collaboratively and sustainably is based on the principle of collegial thing and mutual learning. Lesson study is carried out in three stages, namely plan (plan a), do (implement), and see (reflect) that these forces cycle and sustainable basis. Lesson study is one manifestation of the development of community learning (learning community). In short, the lesson study aims to improve the quality of learning through assessment of learning. According to the definition by Ibrahim its clear if the lesson plan is not the learning methods or action research, but how to make model of teacher to increasing the process of learning. Lesson study instead of learning methods, nor is it a learning approach. Actually, Lesson study is a model of coaching (coaching) professions educators through the study of learning collaboratively and sustainably is based on principles of mutual help in the kolegialitas learn to building a learning community. According to Walker (2005) Lesson study is a method for teacher professional development.



Lewis (2002) suggest there are six phases in the beginning to implement the lesson study at school. Stage 1: Forming a group lesson study, which among others include the activities of recruiting members of the group, devise a specific time commitment, scheduling meetings, and agreed to the rules of the group.

Stage 2: focus on lesson study, with three main activities, namely: (a) agree on the theme of research (research theme) long-term goals for students; (b) select the scope of the material; (c) selecting the unit of learning and an agreed goal. Phase 3: plan a learning plan (Research Lesson), which covers the activities conducted studies on existing learning, cultivate our learning instructions, requesting input from experts in the field of study from the outside (a lecturer or other experienced teachers). Stage 4: implement the learning in the classroom and observe it (observation). In this case study conducted by one of the members of the Group and the other being the observer. The Observer is not allowed to do the introduction to the course learning to teachers and students. Stage 5: discuss and analyze learning, which have been implemented. Discussion and analysis should include grain: Reflections by instructors, group member, background information, presentations and discussion of data from observational learning results, general discussion, comments from outside experts, a thank you. Stage 6: reflect on learning and plan the next steps. At this stage group members are expected to think.

According to discuss the theory in phenomena above the purpose of this study are described such as : (1) investigate the learning process of entrepreneur characteristic and the equipment assessment need ; (2) to find the model of learning to create a professional entrepreneur teacher; (3) to design the model of lesson teacher in creating professional entrepreneur teacher

## 2 METHODS

The lesson study is not only the research, but also the training methods to be a professional teacher. So the methods in doing be a entrepreneur teacher using R and D paradigm for create an effective design. The step of lesson study requirement can be used in methods to formulate the design.

To make a design we need some information so the data information wittl be collect through observation technique and then for the design using FGD for collecting data and both create the data. The data analyzing for this research is using triangulation methods.

The object of this research is the member of MGMP for entrepreneurship SMK Semarang city with the number of membership is 25. All of the

member invited to participate in this lesson study program. The Instrument of this research is questionnaire and interview.

## 2 FINDINGS AND DISCUSSION

Stage 2: focus on lesson study, with three main activities, namely

The entrepreneurship learning process had been done in Semarang City still conventional, as a education system the learning process can be divide in to three aspect:

First, Input are consisted of teacher, student, materials, and equipment. The teacher still lack in entrepreneurship experience, they have knowledge from the material books only, beside it they don't have any idea to make link between theory entrepreneurship and reality, so when they are stand up in front in the class they feel confuse and unbelieve in his/her self, so if they continue to teach only the cognitive domain able to be taught, the other domain untouchable; Student no motivation to be an entrepreneur, they don't have good motivation and low of self reliance; As long as now there is not enough good material for entrepreneurship learning, some of them only talking about theory not in practical. The equipment also not enough even is not existing.

Second, the process of learning , is not running in active learning or creative learning, just direct instruction or one way communication. So the student no have impression during the learning process.

Third, output in line with the input and process, the output also not create the student be an entrepreneur, some of SMK claimed not more than 5 % the graduate be an entrepreneur.

The good model for professional entrepreneurship teacher according to the response of the teacher, 100 % they need a teacher model as a guide in entrepreneurship teaching. They also need a book or practical reference to teach the student in entrepreneurship practice.

The design for lesson study using the step in lesson study process, but need be packaged and be managed as follows: preparation, implementation, finalization. The design can be drawn as below:

Figure 1. Design The Innovative Learning



### 3 CONCLUSIONS

The need of entrepreneurship learning process need the teacher models for increasing the quality of graduate. It will be fulfill if the teacher like to make a group and using the lesson study methods in increasing the professional teacher

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## Pengembangan Media Pembelajaran Gerak pada Tumbuhan melalui Kegiatan *Lesson Study Club* di Kabupaten Pasuruan untuk Meningkatkan Keterampilan Sains dan Berpikir Kritis Peserta Didik

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**Abstrak:** Untuk meningkatkan kualitas pembelajaran di Kabupaten Pasuruan, Pemerintah Daerah melalui Dinas Pendidikan memilih *Lesson Study* sebagai strategi pengembangan profesi pendidik, sejak tahun 2006 sampai dengan 2012 bekerja sama dengan JICA. Kegiatan tersebut berlanjut dengan pembentukan *Lesson Study Club* (LSC) untuk lebih mengefektifkan kegiatan pengembangan profesi guru menjelang pelaksanaan kurikulum 2013 pada tahun pelajaran 2014-2015. Dari kegiatan LSC tersebut penulis mampu mengembangkan media pembelajaran gerak pada tumbuhan berupa LCD *Power Point* setelah beberapa kegiatan Plan yang dilaksanakan mulai bulan April 2014 sampai Mei 2014. Hasil media *Power Point* yang kami buat meliputi : (1) Menampilkan tayangan dalam bentuk gerak mengatupnya daun putri malu (*Tigmo Nasti*) dan membelitnya sulur markisa ke anjir (*Tigmo Tropi*), dengan demikian siswa diharapkan mampu membedakan pengertian gerak tropisme dan gerak Nasti. (2) Menampilkan gambar perbedaan fototropisme (bunga matahari) dan fotonasti (bunga *Mirabilis jalapa*) untuk lebih mengarahkan kerangka berpikir peserta didik. (3) Soal-soal evaluasi berupa visualisasi gerak sulur markisa, mengatupnya bunga venus saat ada serangga. Penyampaian materi gerak pada tumbuhan dengan menggunakan media LCD *Power Point* bisa meningkatkan keterampilan berfikir kritis peserta didik kelas VIII D di SMPN 2 Bangil. Hal ini ditunjukkan dengan 85 % kelompok yang dibentuk mampu membedakan pengertian gerak tropisme dan gerak nasti dan 90 % siswa bisa menjawab pertanyaan evaluasi. Dari hasil diskusi refleksi saat LSC tersebut, disarankan menggunakan Media LCD Powerpoint untuk meningkatkan keterampilan sains dan berpikir Kritis peserta didik apabila, di Lingkungan Sekolah mengalami kesulitan menyediakan media alaminya.

**Kata Kunci :** *Lesson Study Club*, Media Pembelajaran, Keterampilan Sains, Berpikir Kritis

### 1. LATAR BELAKANG

Untuk meningkatkan kualitas pembelajaran di Kabupaten Pasuruan, Pemerintah Daerah melalui Dinas Pendidikan memilih *Lesson Study* sebagai strategi pengembangan profesi pendidik, sejak tahun 2006 sampai dengan 2012 bekerja sama dengan JICA, Kegiatan tersebut berlanjut dengan pembentukan *Lesson Study Club* (LSC) untuk lebih mengefektifkan kegiatan pengembangan profesi guru menjelang pelaksanaan kurikulum 2013 pada tahun pelajaran 2014-2015.

Pembelajaran akan berhasil apabila didukung dengan perencanaan (*lesson design*) yang baik dan penentuan media pembelajaran yang mendukung tercapainya tujuan pembelajaran di kelas. Hal tersebut yang mengilhami pelaksanaan *plan LSC* yang terjadwal di SMP Negeri 2 Bangil, pada tanggal 23 Maret 2014 untuk materi gerak pada tumbuhan kelas VIII.

Pemilihan media *power point* untuk penyampaian materi gerak pada tumbuhan karena kami telah mencoba video gerak tumbuhan yang diunggah dari *You Tube* dan setelah kami diskusikan cukup mewakili pemahaman konsep untuk membedakan gerak tigmotropisme dan tigmonasti. Video tersebut disajikan dalam bentuk *power point* untuk lebih komunikatif dan interaktif

dengan siswa. Kemudian ditinjau pula dari karakter siswa Kelas VIII D yang akan dibuat *open class* adalah siswa yang tergolong pasif dan kurang motivasi belajarnya, sehingga rata-rata hasil belajarnya rendah. Dengan pemakaian media tersebut diharapkan mampu meningkatkan keterampilan Sains dan berpikir kritis siswa di kelas VIII D SMPN 2 Kabupaten Pasuruan.

### 2. RUMUSAN MASALAH

Berdasarkan latar belakang masalah tersebut di atas maka dirumuskan masalah sebagai berikut : Apakah pemanfaatan media *power point* pada materi gerak pada tumbuhan mampu meningkatkan keterampilan sains dan berpikir kritis peserta didik di kelas VIII D SMPN 2 Bangil Kabupaten Pasuruan ?

### 3. TUJUAN

Penelitian ini dilaksanakan untuk memperoleh gambaran yang jelas tentang peningkatan keterampilan sains dan berpikir kritis peserta didik kelas VIII D SMPN 2 Bangil Kabupaten Pasuruan melalui pemanfaatan media pembelajaran dengan program *power point*.

#### 4. DEFINISI ISTILAH / OPERSIONAL

- a. Media program *power point* merupakan salah satu *software* yang dirancang secara khusus untuk mampu menampilkan program multimedia dengan menarik, mudah dalam pembuatan, mudah dalam penggunaan dan relative murah karena tidak membutuhkan bahan baku selain alat untuk penyimpanan data (*data storage*).
- b. Keterampilan sains adalah keterampilan ilmiah yang dimiliki oleh siswa melalui pengamatan, membuat data dan menganalisisnya kemudian mengkomunikasikan hasil analisisnya kepada teman.
- c. Berpikir kritis adalah kemampuan untuk berpendapat dengan cara yang terorganisasi. Berpikir kritis merupakan kemampuan untuk mengevaluasi secara sistematis bobot pendapat pribadi dan pendapat orang lain. Selanjutnya berpikir kritis adalah kegiatan menganalisis ide atau gagasan ke arah yang lebih spesifik, membedakannya secara tajam, memilih, mengidentifikasi, mengkaji dan mengembangkannya ke arah yang lebih sempurna (Cece Wijaya, 1996. dalam <http://www.kajianteoris.com/2014/02/pengertian-kemampuan-berpikir-kritis.html>).

### 5. KAJIAN PUSTAKA

#### 5.1 Media Pembelajaran

Media berasal dari kata latin dan merupakan bentuk jamak dari kata *medium* yang secara harfiah berarti perantara. Jadi media merupakan perantara atau pengantar terjadinya pesan dari pengirim ke penerima pesan. Media adalah alat, metode dan tehnik yang digunakan dalam rangka lebih mengefektifkan komunikasi dan interaksi antara guru dan siswa dalam proses pembelajaran di sekolah. Juga dapat didefinisikan sebagai segala bentuk dan saluran yang digunakan orang untuk menyalurkan pesan atau informasi.

Media pembelajaran merupakan segala sesuatu yang dapat digunakan untuk menyalurkan pesan dari pengirim ke penerima sehingga dapat merangsang pikiran, perasaan, kurikulum dan minat serta perhatian siswa demikian rupa sehingga proses belajar terjadi. Media pembelajaran adalah segala sesuatu yang dapat untuk merangsang masa pikiran, perasaan, perhatian dan kemauan siswa sehingga mendorong terjadinya proses belajar pada diri siswa.

Mengacu pada pendapat di atas, maka media pembelajaran merupakan segala sesuatu yang dapat

digunakan untuk menyampaikan pesan berupa materi pelajaran dari sumber kepada penerima dalam kegiatan pembelajaran sehingga terjadi perubahan pada anak didik, dimana penggunaannya mengacu kepada kurikulum atau tuntutan materi pelajaran.

#### 5.1.1 Program *microsoft power point* Sebagai media pembelajaran

Program *Ms power point* adalah program aplikasi keluarga *Ms Office* yang biasa digunakan sebagai media pembelajaran dengan berbantuan computer. Pada program ini terdapat fasilitas untuk menganimasikan sebuah objek, sehingga objek tersebut dapat muncul, bergerak, berpindah dan menghilang. Sederhananya pemanfaatan fasilitas animasi ini yang membuat *Ms power point* banyak digunakan dalam berbagai presentasi, termasuk dalam pembelajaran di kelas.

### 5.2 Keterampilan Sains

Keterampilan sains merupakan proses atau tahap yang melalui :

#### a. Proses Berpikir

Proses berpikir merupakan proses mental yang kompleks. Raghunatan dalam Yuwono (2013) Mendefinisikan berpikir sebagai aktivitas mental tertinggi manusia. Semua restasi dan kemajuan manusia hanyalah produk pemikiran. Evolusi budaya, seni satra ilmu pengetahuan dan teknologi semua adalah hasil pemikiran. Proses berpikir bukan merupakan proses yang sederhana dan mudah untuk diuraikan. Arends (2008) mengungkapkan bahwa deret ide dan kata-kata membingungkan sering digunakan untuk menggambarkan cara orang berpikir.

Gambaran proses intelektual secara abstrak dari proses berpikir dalam berbagai definisi adalah: 1) berpikir adalah proses yang melibatkan operasi mental seperti induksi, deduksi, klasifikasi dan penalaran; 2) berpikir adalah suatu proses simbolis yang yang mewakili (melalui bahasa) objek nyata dan peristiwa serta menggunakan representasi untuk menemukan prinsip-prinsip penting dari benda-benda dan peristiwa; 3) berpikir adalah kemampuan untuk menganalisis, mengkritik dan mencapai kesimpulan berdasarkan inferensi dan penilaian.

#### b. Berpikir kritis

Beberapa definisi berpikir pada uraian di atas menunjukkan bahwa tindakan yang benar harus didukung oleh cara berpikir yang benar. Salah satu cara berpikir yang benar adalah berpikir kritis (*critival thinking*). Sebagaimana diungkapkan oleh Facione dalam Yuwono (2013) “*At one level we all*

know what "critical thinkin" means – it means good thinking, almost the oppite of illogical, irrational thinking". Berpikir kritis secara sederhana merupakan "good thinking", tetapi tentu saja berpikir kritis lebih dari hanya sekedar berpikir yang baik. Menurut Anderson, L.W & Kratthohl (2011) tiga tingkatan teratas dari taksonomi Bloom (analisis, evaluasi dan mencipta) bisa digunakan untuk mendefinisikan pengertian berpikir kritis. Kadang-kadang ditambahkan juga dengan dua level berikutnya (komprehensif dan aplikaksi). Namun definisi tersebut memiliki kerancuan, tingkat-tingkat tersebut ternyata tidak berurutan secara hirarki. Masih ada overlapping antara satu tingkatan dengan tingkatan yang yang tepat lain. Definisi tepat dan menjauhkan dari kerancuan sebagaimana yang dikemukakan oleh Ennis (1993) adalah "Critical thinking is reasonable reflective thinking focused on deciding what do believe or do". Definisi ini melibatkan semua kemampuan kognitif yang dimiliki seseorang yang belum tercakup pada definisi sebelumnya.

Lebih jauh Facione dalam Yuwono (2013) menyatakan bahwa berpikir kritis adalah berpikir yang memiliki tujuan (titik pembuktian, menafsirkan apa arti dari sesuatu, pemecahan masalah), nemaun lebih penting dari itu yaitu untuk menggunakan berpikir kritis untuk sebuah kerja sama dalam menyelesaikan masalah.

IPA dan berpikir kritis sebenarnya merupakan satu kesatuan. Valentino (2000) menegaskan bahwa berpikir kritis merupakan salah satu dari keterampilan IPA disamping keterampilan proses IPA dan keterampilan penalaran. Oleh karena itu di dalam pembelajaran IPA tiga keterampilan tersebut harus dilatihkan kepada peserta didik. Pembelajaran IPA yang tidak melatih keterampilan berpikir kritis berarti telah kehilangan maknanya.

## 6. METODOLOGI PENELITIAN

### 6.1 Jenis penelitian

Penelitian ini merupakan penelitian kualitatif diskriptif, dengan bantuan Observer dari peserta LSC. Dari data yang masuk kita dapat mendiskripsikan keterampilan sains siswa dan berpikir kritis peserta didik kelas VIII D saat pembelajaran dengan menggunakan media multimedia *power point*.

### 6.2 Subjek penelitian

Subyek penelitian ini adalah kelas VIII D SMP Negeri 2 Bangil Tahun pelajaran 2013 - 2014. Siswa di kelas tersebut terdiri atas 40 siswa dengan 18 siswa dan 22 siswi, kelas ini menghadapi banyak

sekali permasalahan di pelajaran IPA. Selain kelas tersebut bukanlah kelas unggulan, dari keterangan wali kelas didapatkan informasi bahwa kerjasama antar anggota kelas hampir tidak ada. Kemampuan Prestasi Belajar rata-rata kelas inipun sangatlah rendah.

### 6.3 Teknik analisis data

Penelitian ini adalah penelitian diskriptif, sehingga data yang didapat dari observer dimanfaatkan untuk mendiskripsikan kondisi keaktifan siswa. Dari data yang masuk, maka akan dianalisa oleh guru yang nantinya akan dilanjutkan dengan rekomendasi wali kelas maupun pihak BP/BK.

## 7. PROSEDUR PENELITIAN

Tahap-tahap yang ditempuh dalam guruan ini mencakup 1) tahap pendahuluan (pra tindakan), 2) tahap tindakan, dan (3) tahap refleksi dan kegiatan tindak lanjut. Rincian kegiatan dari tahap-tahap itu adalah sebagai berikut:

### a. Tahap pra tindakan (perencanaan pembelajaran)

- 1) Mengujicoba media pembelajaran yang meliputi:
  - a) Komunikatif, mampu menjadi mediator antara guru dan siswa dan tidak bermakna ganda, baik tayangan video gerak, pertanyaan aperepsi maupun pertanyaan evaluasinya
  - b) Jelas baik gambar maupun suaranya.
- 2) Menjelaskan awal tentang pembelajaran yang akan dihadapi. Kelas VIII D belum pernah digunakan untuk *open class* LSBS, maka sebelum tindakan dilakukan terlebih dahulu memberikan informasi tentang adanya beberapa observer yang akan ikut dalam pembelajaran. Kemudian pembentukan kelompok, kelompok dibagi atas dasar kemampuan akademik siswa. Tiap kelompok terdiri atas 5 siswa, Karena jumlah siswa ada 40, maka ada 8 kelompok.

### b. Tahap tindakan/pelaksanaan pembelajaran.

Pelaksanaan OC dilaksanakan pada hari Sabtu 17 Mei 2014 pukul 09.00 WIB sampai pukul 10.20 WIB dengan melibatkan anggota LSC, Satu siswa tidak hadir karena sakit, sehingga kelompok 4 hanya 4 anak, pembelajaran diawali dengan meminta tugas yang sudah dilakukan siswa yaitu foto keadaan daun asam saat pagi dan sore, dari tugas ini kemudian ditayangkan gambar yang telah dipersiapkan di media *Power Point*.

Tampilan pertama berupa Apersepsi dengan menampilkan gambar Daun Lamtoro di saat ada cahaya dan ketika tidak ada cahaya, seperti gambar di bawah ini :

**GERAK PADA TUMBUHAN**



12:11:12 PM

12:11:18 PM

Kemudian Tayangan Video gerak tigmonasti, dan tigmotropi seperti gambar berikut !



Ketika disentuh

Mengatup



Ketika sulur menyentuh kayu/anjir



Sulur membelit Kayu/anjir

Setelah siswa berdiskusi dan menemukan perbedaan gerak tigmonasti dan tigmotropi siswa mempresentasikan hasil diskusinya ke depan kelas setelah mengklarifikasi hasil diskusi, guru meminta siswa untuk menulis hasil klarifikasi dan membuat kesimpulan.

Pada akhir pembelajaran siswa menjawab soal-soal dari tayangan slide sebagai berikut :

Termasuk gerak apakah pada bunga pukul 4 (*Mirabilis jalapa*) pada gambar di bawah ini ?



**PERHATIKAN ARAH MEKARNYA BUNGA !**  
Kemanakah Arah gerakannya ?



**BAGAIMANA ARAH GERAKNYA ?**



**BERUPA APAKAH RANGSANG PADA SULUR TUMBUHAN TERSEBUT ?**



Dari tayangan slide video, perlu di tayangkan sampai 3 kali karena siswa masih belum mampu membedakan antara gerak tigmonasti dan tigmotropi setelah tayangannya diperlambat, akhirnya siswa mampu memberikan pernyataan perbedaan kedua gerak tersebut, setelah diberi arahan apa rangsangannya dan kemana arah gerak tumbuhan tersebut.

**c. Diskusi refleksi setelah pembelajaran**

Saat diskusi refleksi pembelajaran diperoleh beberapa masukan dari observer yang antara lain :

- a. Penggunaan media *Power Point* sangat membantu proses pembelajaran gerak pada tumbuhan mengingat sudah sangat langkah tersedianya tumbuhan putri malu (*mimosa pudica*)
- b. Tayangan jalannya membelitnya sulur markisa begitu jelas menunjukkan arah gerakan yang menuju ke arah rangsang, yang dalam kehidupan nyata tidak tampak.
- c. Dengan tayangan 2 gerak pada tayangan tersebut mampu menumbuhkan rasa ingin tahu siswa dan mulai memikirkan jawaban dengan menghubungkan data yang diperoleh dari tayangan tersebut sehingga diperoleh pernyataan perbedaan antara gerak nasti dan gerak tropisme.
- d. Dengan media yang tepat mampu membantu pencapaian tujuan pembelajaran, hal tersebut dibuktikan dengan hasil ulangan siswa yang 90% mampu menjawab pertanyaan.

## 7. KESIMPULAN

Penyampaian materi gerak pada tumbuhan dengan menggunakan media LCD *Power Point* bisa meningkatkan keterampilan berfikir kritis peserta didik kelas VIII D di SMPN 2 Bangil. Hal ini ditunjukkan dengan 85% kelompok yang dibentuk mampu membedakan pengertian gerak tropisme dan gerak Nasti dan 90% siswa bisa menjawab pertanyaan evaluasi.

Dari hasil refleksi saat LSC tersebut, disarankan menggunakan media *power point* untuk meningkatkan keterampilan sains dan berpikir kritis peserta didik apabila, di lingkungan sekolah mengalami kesulitan menyediakan media alaminya.

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## The Study of The Impact of Pelita Program in The Provinces Of West Java, West Sumatera, South Kalimantan, East Java, And North Sulawesi, Indonesia

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**Abstract:** The quality enhancement program of Junior High School and Islamic Junior High School (called PELITA) has been undertaken in 7 provinces (Banten, West Java, Yogyakarta, East Java, West Sumatra, South Kalimantan, and North Sulawesi) under the support of the Ministry of Education and Culture and JICA in 2009-2013. The objective of the PELITA program is to strengthen the central and local governments' capacities in undertaking LESSON STUDIES and PSBM all over Indonesia. The target of the PELITA program is to cover 1,385 schools in 7 provinces. This study of the impact of the program aims to obtain information about the progress of the lesson studies targeted in the PELITA program, obtain information about learning quality enhancement in nurtured schools, give suggestions and recommendations to targeted provinces based on the results of the study and strengthen networks between partner universities in Indonesia. The PELITA impact study was undertaken in 5 provinces, namely Sumedang Regency in West Java, Pasuruan Regency in East Java, North Minahasa Regency in North Sulawesi, Banjar Baru Regency in South Kalimantan and Padang City in West Sumatera. Data were obtained from questionnaires distributed to teachers, students about MGMP (*Subject Teacher Forum*) activities and teachers' commitment in carrying out teaching learning activities and undertaking academic tests to students in science, mathematics, Indonesian and English. This PELITA study shows that teachers' commitments in PELITA-implemented areas are higher than those without it. In addition, the results of students' academic tests in PELITA-implemented areas are similarly higher than those in areas where PELITA is not implemented. Thus, it can be concluded that the PELITA program is embodies a model that can improve teachers' performances in making their students learn. The result is that students academic competencies have improved in the subjects of science, mathematics, Indonesian and English.

**Keywords:** Lesson Study, Teachers' Commitments, Teachers' Performances, Students' Academic

### 1. INTRODUCTION

The Quality Enhancement Program of Junior High School (JHS) and Madrasah Tsanawiyah (MTs) (PELITA Program) had been administered to 7 provinces (Banten, West Java, Yogyakarta, East Java, West Sumatera, South Kalimantan, and North Sulawesi) under the endorsement from the Ministry of Education and Culture and JICA in the years of 2009-2013. The overall objective of this program is to improve the quality of JHS and MTs through Lesson Study conducted in 4 regencies dan 2 cities in 6 provinces (Sumedang Regency in West Java, Bantul Regency in Daerah Istimewa Yogyakarta, Pasuruan Regency in East Java, North Minahasa Regency in North Sulawesi, Banjar Baru City in South Kalimantan, and Padang City in West Sumatera) and through PSBM in Banten Province. The aim of PELITA Program is to strengthen both central and local governments' capacity in administering Lesson Study and PSBM throughout Indonesia. The target schools of the PELITA Program are 1.385 schools in 7 provinces. The PELITA Program was stopped in February 2013 but the Lesson Study program has been continuing in the target regions/cities under the local government endorsement. MGMP (subject teacher meeting) based Lesson Study was administered to 4

to 8 clusters in every regency/city. The regular meeting of MGMP was given to Mathematics teachers (e.g. on Wednesday) and to Science teachers (e.g. on Saturday). The trained facilitators led the MGMP to plan, provide, observe, and make a reflection on the lesson practiced. Besides MGMP based Lesson Study, school-based lesson study was also implemented in most schools under the needs of appreciation and support from the school principles. All subject teachers participated in the school-based lesson study. Groups of subject teachers did the planning session to prepare the lessons for MGMP days. For example, Monday was for Indonesian language teachers; Tuesday was for English teachers; and Wednesday was for Mathematics teachers. Open lesson involved all teachers or groups of teachers in the schools, conducted on Saturday after school or based on class schedules. A discussion after the open lesson was administered right after the lesson was delivered. The closest universities (UPI in West Java, UNY in Yogyakarta, UM in East Java, UNP in West Sumatera, UNIMA in North Sulawesi, and UNLAM in South Kalimantan) gave technical supports to the PELITA Program. Members of faculties from the university counterparts worked together with the teachers to plan, provide, observe, and make a reflection on the lesson practiced. It



was concluded that lesson study was effective and efficient in developing the quality of teacher professionalism. Teachers were motivated to promote college students' active learning to take advantages of local materials.

Consequently, students enjoyed the learning process since they did not necessarily memorize facts or mathematical formula. The school principles and supervisors were facilitated to monitor teachers' performance. The university counterparts also gained benefits from the implementation of lesson study in schools, since the members of the faculties also got real experience from the schools as an input to improve the pre-service program. However, students' comprehension still needed improvement. Therefore, there is a need to conduct a study to investigate the impact of PELITA Program to gain information related to the continuation of the post-PELITA Program. Each university counterpart plays a vital role to maintain the program and is responsible for administering a study about the impact of PELITA Program in the year 2013, 2014, and 2015. The results of the study are expected to lay a foundation for future research about collaborative study between university counterparts, possibly presented in the symposium of the World Association Lesson Study (WALS) conference in November 2014 in Indonesia.

## 2. OBJECTIVES

- To gain information about the improvement of lesson study in the targets of PELITA Program
- To gain information about the learning quality improvement of the target schools
- To give suggestions and recommendations to the target provinces departing from the results of the study
- To strengthen the networks between the university counterparts in Indonesia

## 3. METHODOLOGY

### 3.1 Populations and Samples

The populations of the study include 5 provinces with the following population and samples:

Table 1 Sample Distribution Of The Impact Study Of Pelita Program

Province	Region/City	DM	MTs	Total population	Total sample (20%)	Control group	Qualitative sample
West Java	Bandung Regency	21	22	430	41	20	1
West Java	Bandung Regency	22	120	261	22	10	10
West Java	Bandung Regency	21	22	430	41	20	1
Local Universities	Bandung City	10	0	26	7	31	4
Local Universities	Bandung Regency	0	7	17	14	10	4
Total		219	244	764	129	90	20

### 3.2 Data Collection Technique

The data collection was conducted both quantitatively and qualitatively. The quantitative data consisted of two components as follows:

- Questionnaires for the Local Education Officials, School Principals, teachers, and students in the target schools.
- Academic Tests for the target and control Cities and Regencies, given to students of JHS and MTs covering the subjects of Mathematics, Natural Sciences, English, and Indonesian Language.

The qualitative survey consisted of the observation of school situation and the observation of the instructions of Mathematics, Natural Science, English and, Indonesian Language.

### 3.3 The Number of Respondents

The respondents in every area included the School Principals, Local Education Officials, teachers, and students. The selected respondents fulfilled the criteria of the required data. The number of respondents for the questionnaire (Q), Academic Test (AT), and Learning Observation (LO) is elaborated in table 2.

Table 2a. The Number of Respondents in Each JHS/MTs

Methods	Target	Control	Total
Questionnaire (Q)	Teachers	1	1
	Students	20	20
Academic Test (AT)	Students	40	40
	Teachers and Principals	11	11
Learning Observation (LO)	Teachers and Principals	1	1
	Students	20	20

Table 2b. The Number of Respondents for Local Education Officials

Method	Respondents	Target City/Regency	Control City/Regency
Questionnaire	1st Deputy of District Education Office (1)	1	1
	2nd Deputy of the Language Subject (1)	1	1
	3rd Deputy of Natural Science Subject (1)	1	1
	4th Deputy of Mathematics (1)	1	1

### 3.4 Data Collection of the Impact of PELITA Program

- Questionnaires: teachers, school principals, students, and supervisors (Education Officials)

- b. Academic Test for students: Mathematics, Natural Science, Indonesian Language, and English
- c. Observation: School situation and learning observation

Quantitative and qualitative data were collected for this study. The quantitative data were gained through test instruments and questionnaires. The academic test was given to the students of grade IX of JHS/MTs covering the subjects of Mathematics, Natural Science, English, and Indonesian Language. The test was particularly intended to measure the students' competence standard on reasoning.

The academic test was given to the students of grade IX as depicted in detail in table 3.

Table 3. Academic Test Instruments

Type of Questions	Total of Questions	Percentage	Total	Test Materials
Multiple Choice (MC)	30 items	100%	30 items	School based Curriculum, 2013
Science	15 items	50%	15 items	Curriculum, 2013, grade VII, VIII
Mathematics	15 items	50%	15 items	Curriculum, 2013, grade VII, VIII
MC for Indonesian Language	20 items	100%	20 items	School based Curriculum, 2013, grade VII and VIII
MC for English	10 items	100%	10 items	School based Curriculum, 2013, grade VII

All instruments were developed by UPI Team. The Academic Test Instruments were also developed by UPI Team and had been pilot tested to two schools in Bandung City.

## 4. DISCUSSIONS

### 4.1 An Analysis of the Impact of the Pelita Program in Five Provinces on Learning Quality as Compared to Control Schools

This study of impact analysis was conducted in 5 provinces, namely Sumedang Regency in West Java, Pasuruan Regency in East Java, North Minahasa Regency in North Sulawesi, Banjar Baru Regency in South Kalimantan, and in Padang City in West Sumatera. Data were obtained from questionnaires distributed to teachers, students on the Teachers' Professional Development Networks (MGMP) activities and teachers' commitments in undertaking learning and teaching as well as students' academic tests on science, mathematics Indonesian, and English.

#### 4.1.1 MGMP Participation

Teachers' participation in MGMP activities in areas that have implemented the PELITA program is shown in the following figure.



Figure 1. Teachers' Participation in MGMP activities

The above figure indicates that teachers' participation in MGMP activities in PELITA-implemented areas are higher amounting to 64.40% compared to teachers in areas where PELITA is not implemented, namely 53.85%. This indicates that the PELITA program has improved teachers' participation in MGMP activities.

#### 4.1.2 The Quality of MGMP Activities

In terms of the quality of MGMP activities, a question was posed to teachers as follows:

From MGMP activities that you have attended (if you have taken part in them), what is the quality of MGMP activities in terms of content (materials), method, and organizing? Mark in appropriate columns.

	Agree	Disagree	Fair	Good	Very good
Content (materials) of MGMP activities					
MGMP Method of activities					
Organizing of MGMP activities					

Teachers' responses in the experimental group and control group are presented in figure 2 as follows:

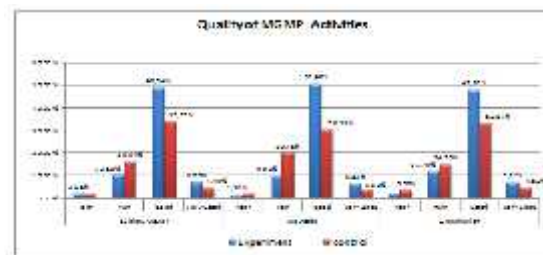


Figure 2. The Quality of MGMP Activities from Teachers' Perspective

Fifty five percent of teachers in PELITA-implemented areas said that the content of MGMP activities is better than that in areas where PELITA is not implemented. Only 35 % of teachers said that the content aspect is good in those areas without PELITA. Similarly, as for the method aspect and organizing aspect, 56% and 54% of teachers

respectively said that they are good compared to those where PELITA is not implemented.

### 4.1.3 The Impact of MGMP Activities

To reveal the impact of MGMP activities as perceived by teachers, the following question was asked:

Choose the appropriate statements about the **impact of MGPM activities** (by crossing the corresponding number (s) ). You may choose 3 answers at the most If you choose **others**, write down specifically what you mean.

(4)	They help teachers to master knowledge on their subjects they teach.
(3)	They equip teachers with innovative and useful teaching and learning methods.
(1)	They bring up real issues dealt with by teachers in the class.
(1)	They provide opportunities to teachers to exchange ideas and experiences.
(1)	They motivate teachers to improve teaching and learning quality.
(3)	They help teachers to enhance their academic competencies (such as in researching and writing scientific articles).
(2)	They help teachers to understand the connections between daily learning and the goals of education in the long term.
(1)	OTHERS (specify...)

To the question posed, the teachers' responses are as follows.

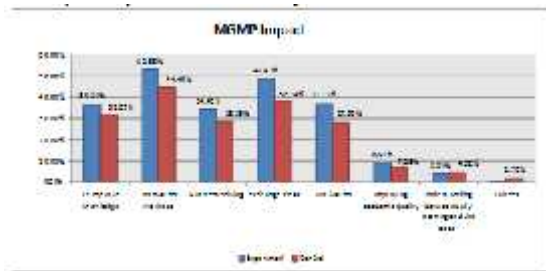


Figure 3. MGMP's Impact according to Teachers

Teachers in the PELITA-implemented areas said that the impact of MPMP is that they can learn innovative methods (52.85% and exchange ideas (48.40%). In areas where the program PELITA is not implemented, the percentages are lower, namely (44.40%) and (38.24%) respectively. Similarly, other aspects such as knowledge enrichment and motivation enhancement are on average higher in percentage than those in areas where PELITA is not implemented.

### 4.1.4 Participation in Lesson Studies

Subsequently, this study aims to discover the participation levels of teachers in attending Lesson Studies. Following is figure 4 which presents the participation levels of teachers in Lesson Studies.



Figure 4. Teachers' Participation in Lesson Studies

Sixty four percent of teachers in PELITA-implemented areas participated in lesson studies and only 24.40% of teachers in areas where PELITA is not implemented took part in Lesson Studies. This shows that the level of teachers' participation is higher in Pelita-implemented areas than in areas where PELITA is not implemented.

### 4.1.5 Lesson Study Quality

The question posed related to Lesson Studies' activities is as follows:

From the Lesson Studies' activities that you have attended (if you have been involved), what is the quality of the Lesson Studies' activities in terms of **Plan, Do, See** and its organizing? Mark in appropriate columns.

ACTIVITIES	Poor	Fair	Good	Very Good
Planning in Lesson Studies Activities				
Doing in Lesson Studies Activities				
Seeing in Lesson Studies Activities				
Organizing in Lesson Studies Activities				

Teachers' Responses are shown in figure 5 as follows:

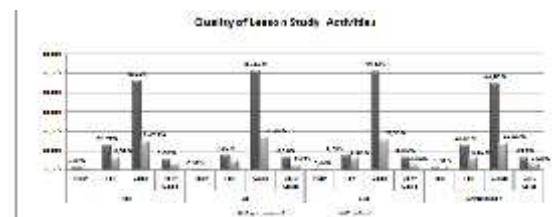


Figure 5. Lesson Studies' Activities from the Perspective of Teachers

The figure reveals that on average more than 52% of teachers in Pelita-implemented areas said that the quality of planning, doing, seeing and organizing is perceived to be better than that in areas where PELITA is not implemented, namely only 20%. This indicates that in general Lesson Studies have not been undertaken in those areas.

#### 4.1.6 The Impact of Lesson Study

The question raised to reveal the impact of Lesson Study' activities is as follows:

Choose the following statements about the **impact of Lesson Study' activities** by crossing the corresponding number(s). You may choose maximally 3 statements. If you wish to choose OTHERS, write down specifically what you mean.

(1)	They help teachers to master knowledge on their subject matter through study.
(2)	They equip teachers with innovative and useful learning and teaching methods.
(3)	They cover real issue that teachers deal with in the class.
(4)	They provide opportunities to teachers to exchange ideas and experiences.
(5)	They motivate teachers to improve teaching and learning quality.
(6)	They help teachers to enhance their academic competence (e.g. researching and writing academic articles).
(7)	They help teachers to comprehend the relationship between daily teaching and learning and long-term education objectives.
(8)	OTHERS (specify.....)

Teachers' answers to the question can be seen in figure 6 below.



Figure 6. The impact of Lesson Studies' activities from the perspective of teachers

The highest percentage (54%) goes to innovative teaching methods which are perceived to be useful as a result of Lesson Studies. This percentage is higher than that of teachers who have not been in the PELITA program, namely 18.90%. Impact is also perceived among teachers in areas which implement PELITA, namely opportunities in exchanging ideas amounting to 48%, whereas teachers who are not affected by PELITA amounts to only 11%.

#### 4.1.7 The Weaknesses of Lesson Studies

To reveal the weaknesses of Lesson Studies' activities, the following question was asked:

Choose the following statements about the **weaknesses of lesson study activities** by crossing the corresponding number(s). You may choose maximally 3 answers. If you choose OTHERS, write down specifically what you mean.

(1)	Lesson Study' activities are not in accordance with teachers' need.
(2)	Lesson Study' activities will be costly in planning, doing and seeing to it being done consistently.
(3)	Only a small number of teachers participate in Lesson Study' activities.
(4)	No coordination and communication between Lesson Study and other institutions.
(5)	An absence of financial support.
(6)	OTHERS (specify.....)

Teachers' responses to the question asked are presented in figure 7:

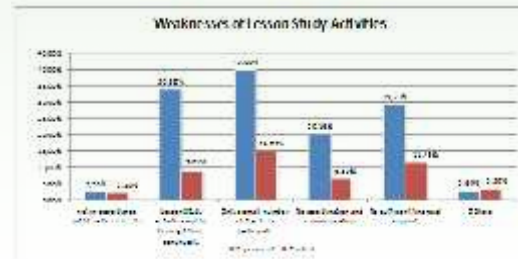


Figure 7. The Weaknesses of Lesson Studies' activities according to Teachers

The biggest percentage comes from teachers' who have participated in the PELITA program, namely 40% for the option "small number of participants", followed by 3.92% for the option "boring" and 29.2% for the option "lack of financial support" (e.g. from headmasters or education department officials). Those data constitute very useful suggestions for the PELITA organizers to undertake Lesson Studies in more meaningful ways so that more teachers will be interested in joining the program.

#### 4.1.8 Teachers' Development

Based on the obtained data in figure 8, as for teachers' development program related to PELITA, generally teachers (above 89%) chose the options "agree" and "strongly agree" that they were given enough opportunities to participate in training activities, to observe teaching and learning and they gave examples how character education should be conveyed through learning materials to be applied in everyday life. Teachers' opinions from areas which have not implemented PELITA are also included. From these data, it is discernible that all the schools have given broad opportunities to teachers to participate in activities carried out in both schools' projects and activities undertaken in their local department of education. This tendency appears to the impact of the programs promoted through the agreement between schools, the local education departments and provincial education departments. In addition, the impact of these programs is that teachers have been made aware of the need to implement character education through real and direct examples that they witnessed.



Figure 8. Teachers' Responses to schools' effort to developing Teachers' Competence

#### 4.1.8.1 School-based Teachers' Development

Meanwhile, the following figure illustrates the school-based Lesson Studies' development.



Figure 9. Teachers' Opinions about School-based Development

Figure 9 shows that in areas implementing PELITA 37.40% of the teachers said their headmasters often and always encourage or organize training, whereas in areas without PELITA only 24% of them said so. Sixty three point fourty eight percent of the teachers in areas implementing PELITA said that their headmasters often and always encourage the teachers to establish study groups in their schools, while teachers in areas without PELITA said that only 48% of them said so. According to data on teachers' opinions in areas with PELITA, 46.61% of them said their headmasters often and always give teachers opportunities to observe teaching and learning, whereas teachers from areas without PELITA said that only 17.5% of their headmasters do so. This indicates that teachers from the PELITA group have more opportunities to observe lessons than their counterparts from the non-PELITA group.

#### 4.1.8.2 Learning Process

This figure shows the learning process which teachers can undertake.



Figure 10. Teachers' Opinions about the Teaching and Learning Undertaking

Information obtained from teachers in areas implementing PELITA indicates that 55% of them said that they often and always various types of teaching media in their teaching and learning. Meanwhile, only 45% of teachers from areas which have not implemented PELITA reported such a thing. This finding indicates that teachers in the PELITA group used more teaching aids than their counterparts. However, as for marking, teachers from both groups said that they often and always administered marking according to the students' performance.

#### 4.1.8.3 Support for Students

Students' success in learning is sometimes affected by non-academic factors such as teachers' psychological support to students. Therefore, through these questionnaires, this study aims to reveal the extent to which this support is given to students. The results are indicated below.

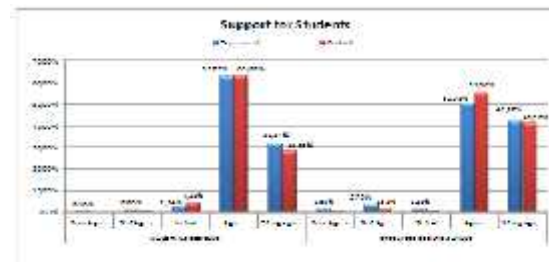


Figure 11. Support for Students according to Teachers

Ninety three percent of teachers in PELITA areas stated that they often and always encouraged their students to work together and develop their potential, and 91% of the teachers said that they often and always positive attitudes in the learning process. This is also the case with teachers from non-Pelita group, that is, 92% of them expressed the same thing. This finding appears to indicate that actually all the teachers have sought maximally to encourage their students to develop their abilities to listen, discuss and self-develop.

**4.1.8.4 Teachers’ Support according to Students**

The following figure indicates students’ opinions about their teachers’ support in learning.

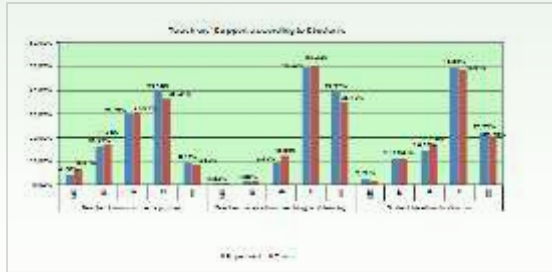


Figure 12. Teachers’ Support according to Students

Following are statements teachers’ support to students.

- The teachers appear to know when I have a problem in the class.
- I feel that the teachers in this school care about my learning process.
- The teachers give the students opportunities to ask questions outside of their classrooms.

Students’ responses to the questions above are as follows.

Eighty seven percent of the students under the PELITA program said that their teachers care about the learning processes in the class and 71 % stated that their teachers give opportunities to discuss and ask questions outside of the classroom. This finding is the same as that among the students from areas that have not implemented PELITA. However, 52% of the students said that the teachers do not know that their students have difficulties or problems in their learning. It appears that, teachers still need to learn to detect students’ learning difficulties in the class. This finding applies to both groups.

**4.1.8.5 Support among Students according to Students**

To reveal support among students in their learning processes, these option statements are presented:

- I feel free to ask questions to classmates when I encounter problems in learning in the class.
- I like to help my classmates if they encounter learning difficulties in the class.

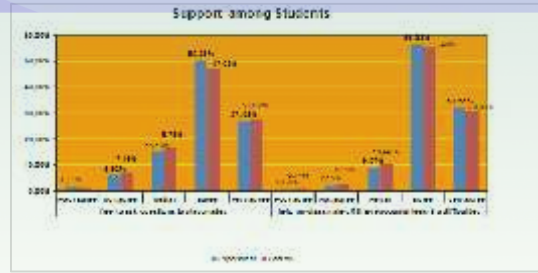


Figure 13. Students’ Responses about Support among Students

This study reveals that 77% of the students agreed that they are free to discuss with classmates, and 87% agreed and agreed strongly that they help each other among classmates. This finding indicates that both the control group (without PELITA) and the experimental group (with PELITA), the students communicate well among one another in the class or in the school. This information is of value because students’ success in learning is supported by their interaction among classmates.

**4.1.8.6 Students’ Perceptions of Science Teaching and Learning**

**1) Group work in Science Learning**

Students were asked to fill out questionnaires about the science learning. Based on the results of the questionnaires, it was revealed about the implementation of group work and idea exchanges.

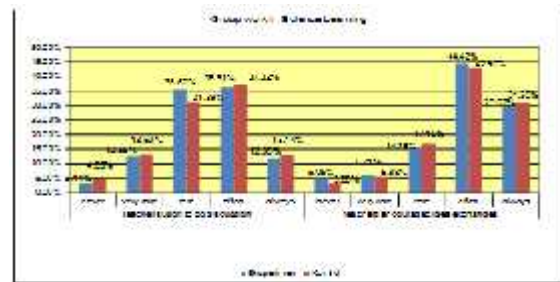


Figure 17. Group in Science Learning

Forty eight point five percent of the students involved in teaching and learning with teachers under PELITA reported that their teachers often and always encouraged the students to exchange ideas in the teaching and learning process. The teachers under the PELITA program are then required to even more motivated to promote group work and idea exchanges because these activities will help develop critical thinking and communication competence.

## 2) The Use of Realia (Science Teaching Aids) According to Students

Based on the following figure, it is shown that in science teaching and learning under PELITA, 59% of the teachers rarely used various realia and teaching aids from everyday life. However, the teachers often involved the students in computations, drawing and other activities. As for the use of realia, teachers trained in Lesson Studies should still be encouraged to use realia more often.

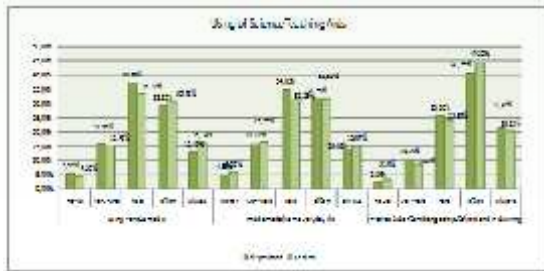


Figure 18. Students' Perceptions on the Use of Science Realia

## 3) Science Teachers' Support

Students' opinions about teachers' support in science teaching and learning are indicated in figure 19 as follows:



Figure 19. Students' Opinions about Science Teachers' Support to Students.

Figure 19 reveals that 65% of the students under PELITA stated that their teachers often and always encouraged the students to work harder. Meanwhile, 89% of the students stated that their teachers often and always helped the students in solving difficult problems (both their lesson problems and other problems). It is also the case with the students' opinions from areas which have not implemented PELITA.

### 4.1.8.7 The Results of a learning Observation of a Science Teacher

The science teacher started the lesson by opening the class, giving the students some motivations and informing them the materials to be covered. This

was a good prerequisite and helped prepare the students for the lesson. In the core activity, the teacher delivered a planned teaching material, which was suitable for the students. This helped the teacher to get the students actively participated in the learning process even without the use of a learning medium. At the end of the class, the teacher closed the lesson by asking the students to draw a conclusion together and giving the students an assignment to help them deepen their understanding of the presented material and preparing the students for the next meeting.

The following were the results of an observation of science subject learning in other PELITA participated school.

Students first saw the teacher demonstrating a static electricity phenomenon by attaching a ruler to a small piece of paper. Students did the same experiment to investigate characteristics of static electricity using a ruler and a small piece of paper. Students were not actively involved in the learning process and found it rather difficult to fill in the students' work sheets. Students had a hard time communicating with their peer. Another problem was that the teacher was busy with some active students. Another problem was that the teaching medium was too small that made it difficult for the students to see it. Students found it difficult to draw a conclusion based on their observation.

Results of an observation of science subject learning in an area not implementing PELITA program was as follows.

At the beginning of the class, the teacher checked students' attendances. He then explained the objectives of the session. When starting the lesson, the teacher did not provide his students with some motivations so that many students did not seem enthusiastic or ready to learn the lesson. The learning process was carried out in a classical format where students sat in a row just as what we would find in a conventional learning.

In the core activity, the teacher checked if the students did the reading assignment he gave in the last session. Apparently, the teacher gave his students a reading assignment (the class was divided into groups of 4-5 students). Some students were asked to come forward and present their understanding of their reading of human reproduction system. After all students did the presentations, the teacher then gave some comments and explained some aspects related to what have been presented by the students. Unfortunately, the result of students' work was not used for a discussion by other groups.

To enhance the understanding of the materials that had been presented by the students, the teacher gave a power point presentation. Unfortunately, the power point presentation was not clearly visible for

students sitting at the back of the class including the observers who were sitting in the back row.

In this activity, no interactive dialogue or discussion took place between the teacher and the students. The teacher indeed asked the students some questions related to his presentation but they did not respond well and the teacher himself at the end had to answer all his questions.

At the end of the class, no reinforcement or conclusion was provided on the materials covered that day. Nevertheless, the teacher gave the students homework available in one of the textbooks used in the school.

Based on the observation of the learning process, in general it can be concluded that the lesson was delivered monotonously. From the beginning up to the end, the teacher did not move from his chair. The teacher did provide a PowerPoint presentation but the content of the presentation did not seem to be well prepared in terms of its viability by the students. The teacher did not pay a good attention to the students so that there were many students who were not enthusiastic in following the learning process.

Pictures of a learning activity in areas not implementing the PELITA program



**4.1.8.8 Students' Academic Achievements**

**1) Comparison of average students academic achievements.**

The chart shows the comparison of the average score for Mathematics, Science, Bahasa Indonesia and English in areas implementing PELITA program and in areas not implementing PELITA program.

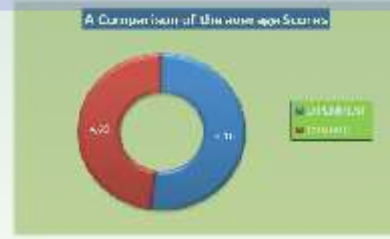


Figure 26. Comparison of academic achievement in areas implementing PELITA program and areas not implementing PELITA program.

The figure shows that academic achievement of students in areas implementing PELITA program was 5.10, which was higher than academic achievement of students in areas not implementing PELITA program of which was 4.69. This shows that PELITA program could help improve students' academic performance.

**2) Comparisons of average students' academic performance in each subject.**

The following figure shows students' academic performance in two areas for each of the subjects.

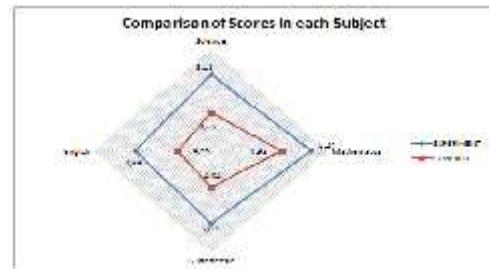


Figure 27. Comparison of Scores in Each Subject

The figure shows that Mathematic subject had the highest score of 5.24 percent in areas implementing PELITA program while the lowest scores on Mathematic subject was 4,64 in areas not implementing PELITA program. The detailed data can be seen in the following figure.



Figure 28. Comparison of Students' Scores in areas implementing PELITA program and areas not implementing PELITA program.



The table shows that in areas implementing PELITA program, West Sumatera province had the highest academic performance of 6.7 compared to academic performance of students in areas not implementing PELITA that was only 5.42. Meanwhile in North Sulawesi, which had the lowest academic performance score, schools implementing PELITA program scored 4.85 and schools not implementing PELITA program scored only 3.19.

## 5. RECOMMENDATIONS

The impact study conducted in five provinces, namely West Java, East Java, North Sulawesi, West Sumatra and South Kalimantan showed that the commitment of teachers in areas implementing PELITA program on average is higher than the one in schools not implementing PELITA program. The same was also true in the students' academic performance; students in schools implementing PELITA program performed better than students in schools not implementing the program. It can be concluded that PELITA program was a model for teachers development that improve teachers' performances in teaching their students which resulted in the improvement of the academic performances of the students in Science, Mathematics, Bahasa Indonesia and English language lessons.

Based on the impact study, we proposed the following suggestions and recommendations:

- a. Teachers' development through Lesson Study was an effective way to leverage the performance of teachers so that the quality of learning would improve
- b. The application of Lesson Study in some areas needed a quality improvement especially in doing the *plan, do* and *see* to help teachers improve the quality of the learning.
- c. Some areas that were no longer doing the MGMP-based lesson study was suggested to do a school-based lesson study due to the importance of teachers having a learning community that could improve the quality of learning.
- d. Teachers needed support from the local education councils and school principals to have have a forum for discussing important issues and developing their potentials through the Lesson Study activities
- e. Based on an identified impact study, teachers' skills that were still weak and needed upgrading were the skills of developing learning media, creating realias from local materials/components readily available in the immediate surrounding and to involving

students in making use of learning media. Thus MGMP-based LS and school-based LS activities should provide teachers with some supports to improve these skills.

- f. Teachers had some difficulties in identifying students' learning difficulties and developing students' motivation. Thus, it was essential for teachers to have a strategy or an approach that focused more on solving students' learning difficulties and stimulating student's motivation through active, innovative, creative and recreative learning.

## PREDICTIVE VALIDITY OF IPP GRADES AND APTITUDE TEST SCORES OF LEARNING ACHIEVEMENT OF ELEVENTH GRADE STUDENTS OF SENIOR HIGH SCHOOL

By: Yaya Sunarya

**Abstract.** Placement as guidance and counseling activity that exists from the beginning of establishment of senior high school is aimed at helping develop students' potencies (aptitudes) as wide as possible, so that if someone has been placed in a field of study suitable with his/her talent/aptitude, success and satisfaction can be achieved. How far has the activity develop students' aptitudes and potencies? Are the first criteria of placement (IPP and aptitudes) able to predict students' achievement? This study aimed at examining predictability of IPP and aptitude scores of achievement of eleventh grade students. Therefore, documentary study of placement documents of several schools in Bandung Regency and Bandung municipality and Cimahi municipality was conducted. Results of the research showed that IPP of Language Program had high predictability ( $r=0.825$ , significant at  $p<0.01$ ) on achievement; IPP of Science Program had enough predictability ( $r=0.376$ ,  $n=631$  significant at  $p<0.01$ ); and IPP of Social Sciences had enough predictability ( $r=0.4$ ,  $n=303$  and significant at  $p<0.01$ ). Whereas scores of aptitudes tests of language had good predictability with  $r=0.506$  and significant at level of trust 99%. Aptitudes of science had very low predictability ( $r=0.078$ , and insignificant). Aptitudes of social sciences had enough predictability, that is,  $r=0.333$ , significant at  $p<0.05$ .

**Key words:** predictive validity, IPP, scores of aptitude test, placement, learning achievement

Processes of schooling manifested in forms of education, academic, administrative and managerial, and individual services. The services are oriented to facilitate optimal development of students' potencies. In the level of senior high school, optimizing potencies of students' academic either through placements of students into fields of study covering science, social sciences, and language. Determining students' placement into one study program conducted at the end of even semester of tenth grade, and its implementation begin on the first semester of eleventh grade.

Based on currently prevailed provision, there are two main criteria that become basic reference for determining placement of students' study program, namely: (1) mastery of academic grades achieved by students in the eleventh grade in group of subjects that become distinctive traits of each study program stated in achievement index of study program; and (2) students' interest toward the program study.

As long as students meet criteria of required IPP, there was no problem. A problem occurs if: (1) IPP is not suitable with their interests, (2) students do not fulfill academic requirement (having one or more low grade(s) of distinctive subjects of each study program), and (3) students meet the requirement but after being placed to certain study program, they feel unsuitable. In this case, to determine study program that should be chosen by the students, procedurally the homeroom teacher need to ask considerations and inputs from guidance and counseling teacher(s).

Involvement of guidance and counseling teacher(s) in decision making of placement, in one hand, is a strategic opportunity because it can strengthen urgency of guidance and counseling teachers at senior high school in making important decision concerning with students' future. In the other hand, this is a strong challenge because guidance and counseling teachers have to be skillful and experts in analyzing students' potencies and capabilities, so that consideration and input that will be given should be appropriate.

Practices of placement at senior high school based on IPP as currently applied evidently have weaknesses, and are often criticized strongly. Placement was considered useless. Mohammad Ali (2006) questioned current practices of placement, where students would bring, to prepare for continuing study to university or entering field of works, still unclear. For example, a student who had entered science field of study, he/she should continue his study to university by choosing science study program. The reality is different where he/she is able to choose any study program. This practice generates negative stigma for social science and language students. Students of social sciences and language have limited opportunity. Hence, parents criticize it. Practices of placement at senior high

schools do not guaranty success of students in society, so that there are a lot of disappointed parents.

Although placement is not new practice, real conditions showed various weaknesses such as (a) students’ and parents’ disappointment toward results of placement; (b) a priori attitudes of students toward existing fields of study where science considered to be more prestigious than others; (c) still a lot of switch of study field, (d) unclearness and inconsistency of provisions where students who have chosen certain field of study at senior high school when he/she continues his/her study to university, he/she may choose other field of study, (e) several schools begin to organize psycho-tests as consideration for placement, (f) favorite schools tend to add seats/classrooms for science field of study rather than social sciences and language ones, and (g) on the other hand, findings based on empirical data suggested that most of students’ aptitudes are suitable to enter social sciences and language field of study than science.

A good model of placement should have a high predictability of success of learning. In line with this, phenomena described above indicate that the model of placement used currently has not meet expectations of concerned parties. Considerations on other aspects apart from students’ IPP and interests which are more valid in predicting success of students’ learning are needed. Efforts for that have been done by the laboratory of Educational Psychology and Guidance of Education Faculty of UPI through collaboration with schools in west java in the form of Psychology Assessment before placements were conducted. The test used in the placement was Intelligence Structure Test (IST). Unfortunately, results and recommendations from the psychology assessment were not used optimally. Although according to its manual, scores of IST have very good predictability toward students’ academic achievement at school.

In the other hand, based on interview with the board of the laboratory, they said that they had no empirical data concerning with predictive validity of placement program recommended to students toward success of their learning. Formula of placement used at the laboratory currently was still results of judgment and its theoretic information was relatively limited, so that empirical validations

were needed. In dealing with this, this study tried to reexamine the formula of placement at senior high school based on scores of IST used currently, hence new formula examined empirically can be formulated.

In line with the discussion above, problems studied in the research can be operationally formulated in the following questions:

1. How the predictive validity scores of certain subjects are established (mentioned in index of study program achievement/IPP) toward success of students' learning in certain department at the eleventh grade?
2. Do the formulas used at the laboratory of educational psychology and guidance in placing students (addition scores of certain aspects) have a good predictability toward learning achievement at the eleventh grade (exactly describing students' tendency of success)?
3. Can aptitude aspects predict students' success in a study program (alone/partially has a correlation with achieved grades)?
4. How can formulas of combination of aptitude and achievement aspects describe real achievements of students?

### **Methodology**

This study utilized descriptive and ex post facto approaches. Descriptive method was used to study students' characteristics happened when the research conducted by using correlation strategy (Satrock, 1977). Ex post facto method used to examine students' characteristics through analysis of grades and IPP documents. Design of this research was cross sectional survey (Shugnessy & Zechmeister, 1994; Lemer & Hultsch, 1983).

Operationally data gained through documentary study were (1) quantitative data in the form of scores of aptitude test covering nine aspects of aptitudes explored by IST (Intelligence Structure Test), (2) data of students' grade achievement in the second semester of tenth grade and grade achievement in the first semester of eleventh grade. Collected grades of subjects were ones in ledger books used as bases for the placement at the school.

### Several Concepts of Predictive Validity, Aptitude, and Placement

“Validity” term is generally found in measurement or assessment field. The term is used to show a level of exactness quality of a measuring tool in measuring aspects of materials or behavior that need measuring. But, validity is also frequently connected with objective(s) of a measurement. In this context, validity defined as exactness of a test (measuring tool) in producing data or information relevant to objective(s) or decision that will be made.

“Predictive” term means forecasting, containing a meaning that something will happen in the future. So, predictive validity of a test is that how far the test can show its ability in forecasting what will happen in the future (Sudijono, 2007: 168-170).

In a provision about placement at a senior high school, it is stated that entering a field of study needs index data of study program achievement (IPP) and consideration of aptitudes and interests of each student (Depdiknas, 2004). In this context, grades of certain subjects and capabilities in certain fields (special aptitudes) are predicted to contribute greatly to someone’s achievement in a field of study.

Abin syamsudin (2005: 60) stated that by observing prominent scores (results of quiz) achieved by a student, a teacher can predict that the student has a capability (special aptitude) in the field and the result can be used as a base for placing the student in a study program (department/ a field of study) at school.

The two views above provide a base that in choosing a field of study, data of students’ learning attainments (achievement) and data of psychology tests (especially about results of special aptitude test). The views strengthened by Dewa Ketut Sukardi (2005) stated that results of aptitude tests appropriately used together with other information materials. The tests should be conducted objectively meaning that in administration and implementation there is no unfair change of scores. Further it explained that if results of aptitude test matched with requirement of work and personal characteristics (results of personality test), hence the results will be able to predict well (having a high predictive value).

In line with this, Sumardi Suryabrata (1999:167) explained that aptitudes have a big role in education processes and it is ideal if we can provide an education suitable to the aptitudes. Someone will be more successful if he/she learns in a field suitable with his/her aptitude. The same is true for someone who will work better if he/she works in a field that suits his/her aptitude.

In dealing with prediction of results of aptitude tests, Murphy and Davidshofer (1988:202) explained, “...although the test is specifically designed as an aid in *making admissions and placement decisions for prospective college*, since it primarily measures comprehensions and reasoning ability rather than knowledge of specific facts”.

From the explanation above, it is clear that aptitude test has a good prediction toward someone’s success in taking an education. Historically search on aptitude began from field of work (occupation), but it turned to field of education. Moreover, nowadays, aptitude tests are activities frequently done in education field. There are a lot of schools organizing psycho-tests for uncovering data concerning with aptitude.

Efforts in understanding students can be done through various ways. Some of them are by assessing students (psychology tests or psychology examination), either done by a counselor or in collaboration with other professional.

Basically, psychology test is symbolizing psychological aspects constructed in a theory. Murphy (1998:73) stated “...all psychological test is to assign numbers to individual so that some attributes of these individual are faithfully reflected by some properties of the numbers assigned”. A problem in assessing level of goodness of a psychological test is that how far the test is able to measure special psychological aspects objectively. So that individuals who gained high or low scores of a psychology test can be predicted whether or not they will be successful, or how are their performance qualifications in real behaviors.

To assess how well a psychological test can predict an individual performance, according to Murphy (1998:73) can be seen from two things, namely: (1) reliability of the test scores and (2) the validity of inferences that are made about individuals on the basis of the test scores.

Concerning with the goal or function of measuring, testing, evaluating or assessing activities, Anastasi (1988), Thorndike, et al. (1991), and Nitko (1996), stated that goal or function of psychology test is as a base of decision making in dealing with selection, placement, and/or diagnostic. But they required that the decision will be appropriate if the test used as an instrument has or meet a requirement of a good test, that is, reliability, validity, and having a good discriminating power or discriminating index.

Reliability refers to a capability level of a test (as a measurement tool) in providing relatively consistent data. It means that when a test is used to the same subjects in different times, or when its items are divided into two, the test showed a high correlation index. Validity refers to a level of test exactness as a tool for measuring aspects expected to be measured. There are several kinds of validity covering content validity, construct validity, criterion validity, face validity, and predictive validity.

In dealing with this study, the most important validity is predictive validity, that is, how far the selection model of placement can predict capability (behavior, achievement) of subjects in the future.

The way of testing for identifying level of predictive validity according to several experts is by correlating scores gained from test predictors with expected behavior. In this study, identifying level of predictive validity is by correlating scores gained from IST test and students' grades of achievement in the form of index of study program achievement (IPP) with gained grades (in the form of achievement) in the first semester of eleventh grade. Another variable uncovered in the study is aptitude. Aptitude scores gained from a psycho-test by using IST test. To examine predictability, IST scores are also correlated with grades gained in first semester of eleventh grade.

### *Aptitude and Its Measurement*



Experts suggested different limitations concerning with aptitude based on their believed philosophical foundations. For example, John Carroll considered someone's aptitude in term of “needed time” side in doing a task or job. Shorter time needed for doing a task, more talented he/she is (Abin Syamsudin, 2000:234).

Morse (1962:257) connected capacity to ability. According to him, aptitude is a capacity, that is, potentials for developing a concept or skill, rather than ability, i.e., actual present potentials for performance. Whereas, Woodworth and Marquis defined aptitude as results that can be predicted and measured by a test developed specifically. He suggested that aptitude can be categorized into a group of ability. But, Guilford defined it by referring to capability in action. He said that number of aptitude test is the same as number of activities that can be done. He added that aptitude has three dimensions, namely: perceptual, psychomotor, and intellectual dimensions. Each dimension consists of more specific psychological factors, for example: capability in memorizing, reasoning, etc.

To measure aptitude, an aptitude test can be used. According to Cronbach (1984:31), “An aptitude test is one intended to predict success in some occupational or training course – there are tests of engineering aptitude, musical aptitude, aptitude for algebra, and so on.” Test for selecting achievement is an achievement test. In dealing with the condition, Abin Syamsudin (2005) explained that achievement test can be used for predicting aptitude, that is, by identifying prominences of scores (in parts/aspects of test) achieved by a student, a teacher can predict that the student has a capability (a special ability) in a field. The result can be used as a base for placing students in a study program at school. The two views provide a foundation that in choosing a field of study, data of learning achievement and data of psychology test results (especially about results of special aptitude) need integrating.

Dewa Ketut Sukardi (2005) explained that results of aptitude tests are most appropriate to use with other information materials. The test should be implemented objectively. It means that in its implementation and administration there is no unfair score changes. Furthermore, he suggested that if results of aptitude test matched

with requirement of work and personal characteristics (results of personality test), then the result will be able to predict well (having a high predictive value).

Whereas, Sumadi Suryabrata (1999) explained that aptitude has a big role in education process and it is ideal if we can provide an education really suitable with aptitude. Someone will be successful if he/she learns in a field suits his/her aptitude. The same is true for someone who will work better if he works in a field suitable with his/her aptitude.

According to Abin Syamsudin (2005: 54) there are six indicators of a talented person as follow:

1. Easiness in using numbers.
2. Efficiency in using language.
3. Quickness in observing
4. Easiness in memorizing.
5. Easiness in understanding relationship.
6. Imagination.

Based on the indicators, people can be categorized into ones that have special basic capabilities in the following field: numbers, language, space control, social relationship, and motor movement.

To detect aptitude, experts have developed various tools/instruments for measuring special capabilities called *aptitude test*. Among aptitude tests, the most frequently used tests are DAT, FACT, and IST. The test instruments uncover various aspects, some of them are:

- a. V = Verbal Comprehensions
- b. W = Word Fluency
- c. N = Number
- d. S = Space
- e. M = Associative Memory
- f. P = Perceptual Speed
- g. R = General Reasoning
- h. Mo = Motor

For schools in West Java that use psycho-tests from the Laboratory of Education Psychology and Guidance of Education Faculty of UPI, uncovering aptitude aspects uses IST test. IST is a tool for measuring special capability (aptitude) that uncovers 9 aspects of aptitude, namely:

1. SE (*Satzerganzung*), especially for measuring problems of forming decision, commonsense, an assessment close reality or reality capability. Through this sub test, capability of thinking independently is expected to uncover.
2. WA (*Wortauswahl*), especially for measuring capacity of integrative verbal thinking, to understand content of a definition through capability in comprehending language matters fully.
3. AN (*Analogien*) measures capability of thinking flexibility, combining, understanding and depth in thinking.
4. GE (*Gemeinsamkeiten*) measures abstraction capability, that is, capability in making/forming understanding and expressing the understanding into verbal language.
5. ME (*Merk Aufgaben*) measures memory power, that is, capability in storing or retrieving learned or memorized words.
6. RA (*Rachen Aufgaben*) measures capability of practical inductive thinking or practical thinking power in counting.
7. ZR (*Zahlen Reihan*) measures capability of theoretical inductive thinking in using numbers or calculation, and rhythmic components.
8. FA (*Form Auswahl*) measures capability in analysis and synthesis.
9. WU (*Wurfel Aufgaben*) measures capability in space or three dimensions control/monitor, constructive-technical components, including analytical components in it.

Based on the 9 aspects, certain study program is predicted or supported by a number of aptitudes. The laboratory of educational psychology and guidance of Education Faculty of UPI has developed a test based on the aspects. For example, to enter language department, it needs reality talent, verbal thinking, analogy, abstraction,

and memory power, etc. Based on the discussion, formula of potency for placement as follow:

$$\text{LANGUAGE} = (\text{SE} + \text{WA} + \text{AN} + \text{GE} + \text{ME}) \times 4$$

$$\text{SCIENCE} = (\text{GE} + \text{RA} + \text{ZR} + \text{FA} + \text{WU}) \times 4$$

$$\text{SOCIAL SCIENCE} = (\text{SE} + \text{WA} + \text{AN} + \text{ME} + \text{RA}) \times 4$$

In practice of placement at schools, several combinations of psychological aspects (aptitude), achievement and school condition are done. A guidance and counseling teacher at school, Sukmana (2005) explained that in placement, schools have to pay attention to: learning achievement, students' interests, parents' expectation, psycho-test results, and capacity of a school.

Based on the explanation above, placement at school at least needs three kinds of basic data, namely:

1. Data of learning achievements in each field of study, realized in IPP.
2. Data of aptitudes owned by students.
3. Data of interests expected by students.

In field of education, each study program or field of work needs more than one aptitude factor functioned. There are various factors need to function for a field of study or certain work place. For example, aptitude for continuing study in technology faculty, factors of number, space, abstract thinking, language, mechanic, and many more. In each individual, there are all factors needed for various kinds of jobs/works, with different kinds of jobs, combination only, constellation, different and intensity (Sumadi Suryabrata, 1999).

One of psychology references stated that students of SMA are individuals experiencing developmental processes. Each individual walks through steps of development. In each step, there are certain tasks occurred as a response of physical changes, maturity of an organ, environment challenges, or physical changes. In psychology term, the tasks mentioned above are called developmental tasks (Hurlock, 1997). As a result, the case can cause difficulties of individuals.

As a whole and conceptually, system of education in our country has answered psychological demands of teenagers/adolescent needs, that is, by existence of school in the level of senior high school and vocational high school. The senior high school is as a realization of development of academic aptitudes, and vocational high school is as a development of vocational aptitudes.

In other condition, developmental tasks often become a challenge and sometimes obstacles for organizing education. But, individuals demanded to be able to complete the tasks because incompleteness of the tasks will cause abnormality or barrier for completing tasks coming up next time. To help complete the developmental tasks, education is needed (Abin Syamsudin, 2005). In order that all students can develop their developmental tasks optimally in the process of education, Blocher (1987) stated that a school needs to be equipped by counseling profession.

If we observe the nature of learners as developing individuals and in each stage of development, certain tasks occur (development task), then education and guidance have been existed since human being existed. But because education and guidance are dynamic things, so they will change and develop. According to Blocher (1987) and Sunaryo Kartadinata (2005) direction and perspective of new guidance and counseling can make guidance and counseling as a proactive and systematic effort in facilitating individuals to achieved higher level of development, effective behavior development, developing a development environment, and improving individual function in his/her environment. All of these behavior changes are processes of development, interaction processes between individual with environment development through healthy and productive interaction. Guidance and counseling have tasks and responsibility for improving environment of development, building dynamic interaction between individual and his/her environment, making an individual to learn about developing, repairing, and making behaviors smooth.

Guidance and counseling activities at school are professional. It means that guidance and counseling have to be done by qualified person in the field. But currently, implementation of the activity is various. The variation (ABKIN, 2004)

is caused by several things. Some of them came from conditions of schools, counselors, real problems face by students with various backgrounds. Aspects of school conditions cover school physical and non physical aspects. The physical aspects of schools consist of conditions and quality of buildings, number of rooms, and facilities. The facilities may generate the variation in organizing or implementing activities of guidance and counseling. Conditions of guidance and counseling teachers in field are also various. Based on a research result done by Solehuddin (2003) described that guidance and counseling teachers at field have various spectrums. The variations were observed from feasibility, service years, and academic qualifications. The variation may generate variation in service quality. Variations of real problems face by students with various backgrounds can determine variation in program arranged.

In states of USA, a model of standardized program created by a professional association (ASCA) is available. The structure of program in general has three components of activities covering *academic development*, *career development*, and *personal/social development* (Bowers and Hatch, 2004). Further more, it was explained that in the program consists of four components of national standards that needs achieving, namely:

*... establish the school counseling program as an integral component to the academic mission of your school, ensure equitable access to school counseling service for all students provided by state-credentialed school counselor, identify the knowledge and skills of all students might acquire as a result of the K-12 school counseling program; and ensure the school counseling program is comprehensive in design and delivered in a systematic fashion to all students.*

### **Provisions of Placement at School**

Based on provisions of the national education department (2004), placement into fields of study at senior high schools should consider the following things:

1. Time for determining and implementing the placement. Determination of study field placement of students for science, social science and language programs begin in the first semester of eleventh grade.

2. Criteria of placement. Choosing study program at senior high school is based on the following criteria, namely:
  - a. Academic grades. Students who are promoted to the eleventh grade and intended to choose certain programs, that is, science, social sciences, or language, may have no more than three subjects which are not mastered yet. The subjects should not be included in ones that have distinctive traits of the chosen program (see the curriculum structure). The students who are promoted to the eleventh grade with having three unfinished subjects placed in a field of study by considering the unfinished subjects. For example, if the unfinished subjects are physics, chemistry, and geography (2 subjects are distinctive to science and 1 subject is distinctive to social sciences), then the students academically placed to language program. If the unfinished subjects are Indonesian, English, and physics, (two subjects are distinctive to language and 1 subject is distinctive to science), then the students are academically placed to social sciences program. If the unfinished subjects are economics, sociology, and English (2 subjects are distinctive ones of social sciences and 1 is distinctive to language), then the students are academically placed into science program. If the unfinished subjects are physics, economics, and Indonesian (covering all of subjects that become distinctive traits of the three program at senior high school), then considerations are needed on students' achievements of knowledge, attitude, and practice of subjects that become distinctive traits of science program such as physics, chemistry, and biology compared with ones that become distinctive features of social sciences program (Indonesian and English). The comparison of achievement grades of students can be done through remedial program and ended by examination. If grades of each subject that become special feature of certain program are more prominent, then the students can be placed into the program with the prominent grades. If the interest and achievement are not suitable, a homeroom teacher with some considerations from guidance and

- counseling teachers can determine what program that can be chosen by the students.
- b. Students' interests. To know students' interest can be done through questionnaires and interviews, or other ways that can be used for detecting interests and aptitudes of the students.
3. For students who have fulfilled requirements for entering all programs, they have an opportunity to change their programs if they feel unsuitable with the first program or inappropriate with their learning capability. The school needs to facilitate them in order to reach standards of competences and basic competences in the new class.
  4. Time limitation for changing the program is determined by the school, the latest is in 1 (one) month.
  5. A school can add criteria for placement based on characteristics and needs of each school.

The provisions require certain things for someone who chooses a field of study. Hence, the placement can be considered as both selection and placement.

## **Research Results and Discussions**

### **1. Predictability of Index of Study Program Achievement (IPP)**

Results of a correlation test between index of study program achievement and means of achievement grades in primary subjects of language fields (n=19 subjects), gained  $r=0.825$  significant on  $p<0.01$ . The correlation number according to Guilford categorized into high correlation. The correlation showed that there is high relationship between the two correlated variables. It means that, in this context, index of study program achievement gained by students in the tenth grade had a high connection with their achievement in the eleventh grade. In other words, IPP grades of language field can become a predictor for seeing students' success in the following grade.

In science field, results of correlation calculation between IPP with achievement grades in the first semester of eleventh grade acquired correlation



index  $r=0.376$ , with  $n = 631$ , significant to  $p<0.01$ . The index of correlation number was categorized into medium correlation. This showed that predictability of IPP grades of science field in the tenth grade toward achievements of primary subjects of science field in the eleventh grade was real (significant).

In social science field, results of correlation calculation showed  $r=0.414$  with  $n=303$  and significant at  $p<0.01$ . This correlation index was included in medium or enough qualification. It means that index of study program achievement of social science fields gained from average of some subjects predicted very well for success of attained achievement in the eleventh grade of senior high school.

## 2. Predictability of Aptitude toward Learning Achievement

Analysis or description concerning with predictability of aptitudes toward achievement is going to be explained as follow:

### a. Predictability of Aptitudes toward Achievement in Language Fields

A whole results of prediction calculation stated in correlation can be seen on the following table.

**Table 4.1**  
**Matrix Correlation among Sub Aspects of Aptitudes with Potency and Achievement in Language Field of Study**

	SE	WA	AN	GE	ME	BHS	IPP	PRESS
SE	1.00							
WA	.159	1.00						
AN	.058	.177	1.00					
GE	.316	.211	.307	1.00				
ME	.193	.309	.417	.543	1.00			
BHS	.477	.583	.434	.629	.574	1.00		
IPP	.253	.157	.293	.306	.216	.188	1.00	
PRES	.388	.358	.378	.343	.275	.506**	.825	1.00

\*) Correlation is significant at the 0.05 level (1-tailed).

From the table, some of the sub tests having very good correlation with learning achievement can be seen. The first five sub tests (SE, WA, AN, GE, ME) partially have correlation with achievement ranging from 0.275 to 0.388 significant at level of trust 90 up to 95%. Then the five sub tests were examined and predicted as basic success of language fields. In the research, it was proved that if the five aspects

were integrated, they had a good predictability with  $r=0.506$  and significant at level of trust 99%. Thus, the formula model provided by the Laboratory of Educational Psychology and Guidance proved to have a good predictability.

b. Predictability of Aptitudes toward Achievements in science fields

Several aspects of aptitude predicted to have a good supportability toward achievement in science are GE, RA, ZR, FA, and WU. The calculation results to answer the problem can be seen in the following table.

**Table 4.2**  
**Matrix Correlations among Sub Aspects of Aptitude with Potencies and Achievements of Science Fields in Placement of Science Study Program**

		GES	RA	ZR	FA	WU	IPA	IPP	ACHIEVEMENT
GES	Pearson Correlation	1	.241*	.245*	.179*	.241*	.481*	.060	.038
RA	Pearson Correlation	.241*	1	.499*	.264*	.267*	.625*	.305*	.108**
ZR	Pearson Correlation	.245*	.499*	1	.314*	.273*	.691*	.186*	.118**
FA	Pearson Correlation	.179*	.264*	.314*	1	.331*	.625*	.040	.063
WU	Pearson Correlation	.096*	.267*	.273*	.331*	1	.617*	.065	.023
IPA	Pearson Correlation	.481*	.625*	.691*	.625*	.617*	1	.217*	.078
IPP	Pearson Correlation	.060	.305*	.186*	.040*	.065*	.217*	1	.376**
ACHIEVEMENT	Pearson Correlation	-.038	.108*	.118*	.063*	.023*	.078	.378*	1
	Sig. (2-tailed)	.344	.007	.003	.113	.568	.050	.000	
	N	631	631	631	631	631	631	631	631

\*\*\*) Correlation is significant at the 0.01 level (2-tailed)

From the table, it can be seen that correlation owned by aspects of GE, RA, ZR, FA, and WU (partially) toward learning achievements of science fields is low (all of them are under 0.2), although some of them show significant correlations. It means that learning achievements of science fields in the first semester of eleventh grade can not be predicted by the aptitude scores. In other words, predictability of aptitude toward achievement in science fields is low.

In other conditions, if scores of GE, RA, ZR, FA and WU aspects are combined, as formulated by the Laboratory of Educational Psychology and Guidance, number of correlation is low ( $r=0.078$ , and insignificant). It means that either partially or in combination, achievement grades of subjects of science fields can not be predicted by scores of aptitudes of science fields.

c. Predictability of Aptitudes toward Achievement in social science fields.

To identify or examine predictability of aptitudes expected to support social science fields can be seen in the following table.

**Table 4.3**  
**Matrix Correlation among Sub Aspects of Aptitude with Potencies and Achievements of Social Sciences in Placement of Social Sciences Study Program**

		SE	WA	AN	ME	RA	IPS	IPP	ACHIEVEMENT
SE	Pearson Correlate	1	.138*	.170*	.211*	.167*	.510*	.119*	.160**
WA	Pearson Correlate	.138*	1	.227*	.312*	.249*	.538*	.031*	.197**
AN	Pearson Correlate	.170*	.227*	1	.215*	.266*	.592*	.134*	.270**
ME	Pearson Correlate	.211*	.312*	.215*	1	.295*	.650*	.202*	.213**
RA	Pearson Correlate	.167*	.249*	.266*	.295*	1	.541*	.050	.098
IPS	Pearson Correlate	.510*	.538*	.592*	.650*	.641*	1	.210*	.335**
IPP	Pearson Correlate	.119*	.031*	.134*	.202*	.050	.210	1	.414
ACHIEVEMENT	Pearson Correlate	.160*	.197*	.270*	.213*	.098*	.335*	.414*	1
	Sig. (2-tailed)	.005	.001	.000	.000	.089	.000	.000	
	N	303	303	303	303	303	303	303	303

\*) correlation is significant at the 0.05 level

From the table above, it can be seen that correlation numbers gained from aspects of aptitudes connected to social sciences (rationally they predicted as requirement for achieving good achievement in social science fields), namely: SE, WA, AN, ME, and RA have low correlation numbers (between 0.2 up to 0.3), but almost all are significant at  $p<0.05$  and  $p<0.01$  (except RA aspect). If the aspects are formulated (like one done by the laboratory of educational psychology and

guidance of UPI), in fact, they have higher correlation values, that is,  $r=0.335$ , significant at  $p<0.01$ . It means that considered aspects of aptitude have a good predictability.

### **Discussions of Research Results**

If scanning results of data process as described above, in dealing with IPP, in fact IPP on all fields of study have good predictions on attaining learning achievement in the eleventh grade, although the prediction is low. It means that other aspects that also influence attainment of good achievement.

According to experts, there are a lot of things that are able to predict learning achievement. One of them mentioned by Murphy (1998) as *attribute psychologist*. Murphy then mentioned that psychological aspects are not enough, but the important thing is quality of instrument that uncovers the aspects.

Low number of prediction of IPP toward learning achievement also can be caused by low quality of teachers' made tests. Based on the writer's experience in analyzing the teachers' made tests, only 25% up to 40% of the tests were categorized into good ones. IPP gained by adding some grades of distinctive subjects of study program taken from test items made by teachers. Learning achievement also acquired from tests in the eleventh grade using teachers' made test. It means that it is possible that either a test used for uncovering IPP or one used for measuring achievement did not have a good quality.

Several experts suggested that intelligence and aptitude are factors frequently called as predictor. But, why there were a lot of studies concerning with it were fail to predict someone's success. This is in dealing with validity and reliability of an instrument. If observing current school conditions where there are a lot of test leaks, where dishonest teachers intentionally gives answer keys to students. As a result, a valid and reliable test will not be able to predict well.

Murphy (1998: 111) explained that there are six groups/kinds/categories causing inconsistency of scores of a test. The six categories consist of:

1. Lasting and general characteristic of the individual.

2. Lasting but specific characteristic of the individual (factors affecting performance on many or all tests at a particular time).
3. Temporary but general characteristics of the individual (factors affecting performance on many or all tests at a particular time).
4. Temporary and specific characteristics of the individual.
5. Systematic or change factors affecting the administration of the test or the appraisal of test performance.
6. Variance not otherwise accounted for (chance).

Other research findings are that in language field of study, several formulated aspects of aptitudes had a good prediction toward achievement. In other words, the aspects of attitudes (SE, WA, AN, GE, ME) had a good prediction toward learning achievement of the language field of study. If we analyze them further, results of correlation of aspects of aptitude and grades of subjects can be seen in the following table.

**Table 4.4**  
**Matrix Correlation between Sub Aspect of Aptitude with Language Learning achievement in Language Study Program**

		IND	ENG	MATH	LIT	ANTR	JPG	HIST
SE	Pearson Correlation	.478	.238	.255	.101	.215	.210	.172
WA	Pearson Correlation	.442	-.005	.432	.133	.175	.218	.193
AN	Pearson Correlation	.454	-.184	-.336	.431	-.105	.572	.287
GES	Pearson Correlation	.181	.246	-.123	.005	.491	.043	.580**
ME	Pearson Correlation Significant (2-tailed) N	.251	-.120	.039	.062	.327	.158	.268
		.301	.625	.873	.800	.172	.518	.267
		19	19	19	19	19	19	19

From the table above, it is clear that SE, WA, and AN have correlation of good predictability with achievement on Indonesian subject and significant at the level of trust 95%.

If seeing from predictability of each aspect of aptitude, the description as follow: Aspect SE (reality capability) has good prediction toward achievement of

Indonesian ( $r=0.487$ , significant at  $P<0.034$ ); aspect WA (verbal language capability) has good predictability toward Indonesian and Math ( $r=0.442$  and  $0.432$ , significant at level of trust, 94%); AN (analogy/thinking flexibility) has a good predictability toward Indonesian ( $r=0.454$ , with  $P<0.051$ ), Indonesian Literature ( $r=0.431$ ,  $P<0.065$ ), and achievement of Japanese Language ( $r=0.572$  with  $P < 0.010$ ). Then aspect of GE (abstraction capability) has a good prediction toward anthropology achievement ( $r=0.491$ , with  $p < 0.033$ ) and toward history achievement ( $r=0.580$ , with  $P < 0.172$ ). Whereas, aspect of ME (memory) provides good prediction toward anthropology ( $r=0.327$ , with  $P < 0.17$ ). These facts show that each aspect of aptitude has its prediction toward field or assessed aspect. Whereas, it explained by Thorndike, et all (1991:357), Morse (1962: 256-258), and Murphy (1998) said that the point is to explained that an aptitude test constructed based on certain aspects in the future. The success can be in academic field (education) or occupation.

Morse (1962: 283-284) suggested that test as a predictor, “...the use of test for predicting how well students are likely to do in school and college.” It explained further by Cronbach (1984: 31) that “...an aptitude test is one intended to predict success in some occupational or training course.” Further more, it was elaborated that although in reality an aptitude test could be more general and uncovered several concerned aspects. For example,”...a test of engineering aptitude may include sections measuring general mental ability, mechanical and spatial reasoning, and proficiency in mathematic.

Further more, it was explained by Cronbach (1984) that “...the achievement/ aptitude contrast is one of point of view, more than the test content. Any test was an achievement test inasmuch as it is a report on development and learning to date, and it is aptitude test in as much as it says something about the future...A test used to identify such students come to be known as a minimum competency test.”

From the discussion above, it is clear that an aptitude test measures certain aspects that conceptually predict someone’s success in doing a field of work (performance) or forecast someone’s success in reaching an achievement in a field

of education. Someone who has a high score in one aspect of aptitude test is predicted to reach a success in a field of work or education.

Another research result is that in the sample group of science field of study, the gained correlation number was very low. It means that the predicted aptitudes that have a relationship or become a base for determining achievement, in fact, are not visible. But partially the aptitudes have good predictability toward learning achievement in the eleventh grade. The predictability can be seen in the following table.

**Table 4.5**  
**Matrix Correlation between Sub Aspects of Aptitudes with Achievement in Science Field of Study**

		MATH	PSYC	BIO	KIM
GES	Pearson Correlation	.045	.011	.062	-.078
RA	Pearson Correlation	.148**	.200**	.237**	-.021
ZR	Pearson Correlation	.144**	.150**	.164**	.025
FA	Pearson Correlation	.030	.041	.080	.039
WU	Pearson Correlation Significant (2-tailed) N	.014	.071	.009	.003
		.718	.073	.826	.935
		631	631	631	631

In the table above, it can be seen that primary subject or distinctive subjects in science field of study covers Mathematics, Physics, Biology, and Chemistry. Whereas, aspects of attitudes that become predictors consist of GE, RA, FA, and WU.

Sub aspects of GE (*Gemeinsamkeiten*) or abstraction capability, FA (Form Auswahl) or analysis and synthesis capability, and WU (*Wurfel Aufgaben*) or space/three dimensions control capability are not predictor on achievement in primary subjects of science field of study. It means that correlation of all of the

aspects is under 0.1, whereas aspect of RA (Rachen Aufgaben) or practical calculation capability and aspect of ZR (Zahlen Reihan) or capability in theoretical calculation have significant correlation with achievement in mathematics, physics, and biology, except chemistry. According to Utami Munandar (1985:15-17) that whether or not someone’s aptitude can be realized into achievement, determined by environment conditions like treatment and knowledge of teachers/parents, structure and infrastructure of school, interests of students groups mainly peer groups, and also internal factors such as motivation, drive, persistence, and perseverance.

In dealing with the discussion above, Dewa Ketut Sukardi (2005) explained that results of aptitude tests is appropriately used together with other information materials, and if the test is implemented objectively, meaning that in its implementation and administration there is not unfair score changes. Further more results of the aptitude test are matched to requirement of work and personal characteristics (results of personality tests), then the test results will be able to predict well (having a high predictive value). Concerning with this result of the study, probably one (or two) variable(s) in the research has a defect in conducting data administration. In this case, the most possible defect is invalidity of learning achievement data.

The existence of the invalidity is strengthened by several research results showed (1) there were students’ negative attitudes toward several subjects, (2) students’ learning motivation was low, (3) there was an assumption that science field of study is the best, so that the students bragged about them selves and they considered that social science field of study is the second class, and (4) there was a tendency that a favorite school just opened science field of study.

Another research result is that IPP of social science field of study has significant correlation toward achievement in social science fields (primary subjects in social science field of study). The correlation is that  $r=0.335$  significant at  $P<0.01$ . It means that aspects of SE, WA, AN, ME and RA all together are predictors toward social science achievement. Partially correlation among the aspects of aptitudes can be seen in the following table.



**Table 4.6**  
**Matrix Correlation between Sub Aspects with Achievement in Social Science Field of Study**

		MATH	HIST	GEO	ECO	SOC
SE	Pearson Correlation	.048	.124*	.127*	.086	.143*
WA	Pearson Correlation	.132*	.238**	.142*	.064	.075
AN	Pearson Correlation	.233**	.228**	.136*	.172**	.118*
GES	Pearson Correlation	.183**	.236**	.073	.098	.126*
ME	Pearson Correlation	.133*	.111	.005	.043	.037
	Significant (2-tailed)					
	N					

\*) Correlation is significant at the 0.05 level (2-tailed).

Numbers in the table above can be described as follow. *First* in social science field of study, mathematics is predicted by 4 sub aspects of aptitude, namely: WA, AN, ME, and RA. But, aspect of SE does not really predict. It means that capabilities of language, analogy, memory power, and practical calculation can predict mathematic achievement in social science field of study, whereas reality capability does not guaranty occurrence of mathematics achievement in the field of study. *Second* achievement of history subject in social science field of study is predicted by capabilities of reality, language, analogy, and memory power. Practical calculation capability does not predict achievement in history subject. In other words, someone who has good scores in the first four aspects is predicted to have a good achievement in his/her history lesson. *Third* achievement in Geography can be predicted from capabilities of reality, language, and analogy (thinking flexibility). But, memory power and practical calculation do not predict well. Fourth, achievement in economics is only predicted by analogy capability, whereas the other four do not have good prediction. Fifth, achievement in sociology can be predicted by scores of reality, analogy (thinking flexibility) and memory power capabilities.

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## The Implementation of Lesson Study to Enhance The Activity and The Capability of Student Critical Thinking in Vertebratal Zoology Course

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**Abstract:** Vertebratal Zoology Course in University of Palangka Raya in due course is delivered using Direct Instruction; lecturer become the learning center, so the student activities tend to be less. Lesson plan was composed without involving other collegians, lecturers work on their own. The demand on learning achievement are not only in cognitive aspects but also accompanied by other skills such as critical thinking. The implementation of lesson study (LS) by applying cooperative learning model of Student Team Achievement Division (STAD) type to be applied to develop the activity and the capability of student critical thinking. STAD is a learning model in which students are demanded to work independently, cooperative, and revealing their thought to other students in learning process. The implementation of Lesson Study were conducted four times covering plan, do and see with STAD learning model on vertebrate course to enhance the activities and critical thinking capability. The results of the study showed that with STAD model in 4 cycles were able to enhance the activities during the problem analysis stage, discussions and delivering its results on vertebrate zoology topics which are in line with plan, do and see cycles. Critical thinking capability of students are better, evidence from the answers and questions raised by students during discussion and their presentation of each group from given assignments. Therefore, it can be concluded that the collaboration and mutual learning as a result of the LS implementation could enhance the activity and student critical thinking capability during vertebrate zoology lecturing stage by stage.

**Keywords:** lesson study, cooperative learning, learning activity, critical thinking.

### 1 INTRODUCTION

Lesson Study is a sustaining classroom-based development strategy for teachers profession development by researching collegians principles and mutual learning to establish learning communities (Susilo *et al*, 2011), its three philosophy of learning community, public, democracy, and excellency (Sato, 2014). A teacher is not only performing teaching but he also developing a learning process every day. The development is called *jugyo kyenyuas* a medium to analyze the learning process by a teacher together with others (Syamsuri & Ibrohim, 2011). Therefore to develop a professional educator, a lecturer is not only able to teach, but by forming a learning community to study a learning process in depth in a classroom.

Generally, vertebrate zoology lecturers in University of Palangka Raya are performed using

Direct Instruction with a stressing on a lecturer as a learning centre. Lesson plans were created individually; learning purpose was stressed on cognitive only. Meanwhile in learning, there are also affective and psychmotoric skills (Sudjana, 2005). In daily live, we need skills to be developed as a lifeskills such as critical thinking capability. Based on the results of survey of National Association of Colleges and Employers that the Higher Education output quality in job fields are also determined by soft skill such as social interaction capabilities, not by GPA. To develop social interactions including activities and critical thinking of students, a lecturer could apply cooperative learning model (Killen, 2009) of Student Team Achievement Division (STAD) type. The principles of STAD learning model was developed by Slavin, in which students are demanded to be independent, cooperative, and delivering their thoughts to other students during learning process to produce social interactions

(Arend, 2009). For thermodynamic course, the capability to think critically, learning mastery increased by 28,9 % and the classroom average score increased from 68,4 to 74 after the implementation of the STAD model (Zulhelmi, 2011). Also, the application of Lesson Study for learning Sciences, students achieved the lesson material and also enhance the capability to study critically (Suyanto, 2011). Accordingly the implementation of Lesson Study with the application of STAD could enhance critical thinking to understand concepts thought by a teacher or lecturer. The study method for the implementation of Lesson Study on vertebrate zoology course were performed in four cycles. Every cycle consists of plan, do, and see. It started from syllabi study, learning execution, and reflection (Lewis, 2006). The taskforce consists of one model lecturer and three observers with similar leveled skills. During the plan stage, the lecturer collaborate with three observers to create a Lesson Plan (LP = SAP) and student working sheets (SWS = LKM) as an observation sheet. On do stage or the execution and learning observation (open class), an in charge lecturer (ICL) conducted class as planned in LP. Other collaborators acted as observers. On see stage or reflection the ICL and other observers revealed facts found during the lecturing and discussed for improvement. All observers studied the student learning process in depth based on open observation sheets. The studied subjects as data sources were students from biology education study program who took vertebrate zoology course during the even semester. Instrument to collect data was observations sheet toward activities and critical thinking of students. The resulting data on activity and critical thinking were analyzed descriptive-qualitative

## 2 RESULT AND DISCUSSION

Observation results on the student activities during LS implementation with the application of cooperative learning of STAD type on vertebrate zoology topics can be seen on Table 1. According to Table 1 during the learning process or do 1, 2, 3 and 4 the activity of students increased. On first open lesson the capability of student to explain the connection of concepts were poor (a), classroom discussion were optimal since many students were still passive and never asked or argue (b), student has never used lecturer as a supervisor or companion during learning process because they used to be in a centralistic learning process (c), Student interaction

during lecturing were adequate (d). The capability of student to present the group achievement (e) Student maintained their activity results (f).

Table 1. The Implementation of Lesson Study on student activity with STAD learning model

Activity	Observed results ( In Do stage during open lesson)			
	I	II	III	IV
a	2,6	2,7	3,0	3,4
b	3,0	3,1	2,8	3,1
c	2,9	3,2	3,2	3,5
d	3,0	3,2	3,4	3,5
e	3,1	3,0	3,2	3,2
f	2,9	3,2	3,2	3,3

Note :

1 : poor, 2: adequate, 3, good, 4: excellence

During the 2<sup>nd</sup> open lesson it was recognized that the capability of students to explain the connection of concepts were improving (a), Classroom discussion run optimum, many students started actively (b), Students already took advantage of having lecturer as a supervisor and companion during learning process (c). Student interactions during learning process run adequate (d). On Do stage from first open lesson, the student activities were seen clearly during the discussion which can be categorized well. (e), Then during the presentation of student group achievement. The activity changes connected with the syntax of STAD which was more during discussion and presentation of discussion results.

On do stage for the third and fourth open lesson all students activities observed have reached maximum scores on problem resolving, discussion, presentation, and giving opinion which can be categorized as very satisfy. According to stages on the application of Lesson Study (Hartono, 2011), that during the learning process, as a results of the changes of learning model from direct instruction to become STAD, in this study stages of Lesson Study helped model lecturer a lot to perfect Lesson Plan which was created collectively amongst lecturers from related subjects.

The study results on student activities showed that STAD learning model were able to activate students to follow the learning process well. Besides, the application STAD could centralize the learning process to students. It was evidence from the increasing of the student role during learning process. The implementation of Lesson Study for the lecturer of Chemistry Textbook and Curriculum Overseen with cooperative learning model in a small

group and presentation could improve communication skills in learning process (Hartono, 2011).

Element to think critically used in this study were adopted from Inch (Inch, 2006) with only five elements of critical thinking ;asking the problem (a), aims (b), information (c), concept (d), interpretation and making conclusion (e). The observation results on the critical thinking capability by application of STAD cooperative learning for vertebrate zoology topics with modified critical thinking capability from each element are listed in Table 2.

Table 2. The Implementation of Lesson Study with the application of STAD Model toward the critical thinking for vertebrate zoology course

Critical Thinking	Results of Observer Assesment on Open Class			
	I	II	III	IV
a	2,75	3,75	3,75	4,00
b	3,00	3,75	4,00	4,00
c	2,00	2,50	3,25	3,75
d	2,50	3,25	3,75	3,75
e	2,00	3,00	3,00	3,50
Average	2,45	3,25	3,55	3,80

Note :

1 : poor, 2: adequate, 3, good, 4: excellence

Based on the implementation of plan do and see for 4 times, it was known that the students capability to describe the discussion results was getting better as a result of the application of STAD learning model which was implemented with Lesson Study. Also, to understand the aims, interpretation and making the conclusion showed a similar trend. This is in line with LS for biology course with NHT model (Pangestu, 2011). Lesson study provided experience for students as an effective effort to enhance the learning quality by lecturer and also student learning activities. This based on the development of Lesson Study as a result of knowledge professional “sharing” on teaching practice and result by related subject lecturers. Students joining lecture Lesson Study have learning quality not only to understand the concepts being thought, but they also have other competency that is able to be developed as a life skill (Suherman, 2011). The learning focus with Lesson Study is mainly for student activities based on the real experiences in the classroom, then Lesson Study is able to be used as a base for the development of

learning cooperatively by placing a teacher or lecturer as the researcher of the learning process (Warianto, 2011).

Table 3. The role of a lecturer during the Implementation of Lesson Study for vertebrate zoology course

LS cycle	Participant (LS cycle)				Collaboration Activity Quality
	I	II	III	IV	
Plan	3	3	3	3	Adequate
Do	6	6	8	8	Good
See	6	9	8	8	Good

During the execution of Lesson Study for 4 cycles, it could enhance the collaboration activities amongst biology lecturers, especially Lesson Study team in zoology fields during Plan, Do, See activities. Lecturer activities during Plan agreed with the corresponding lecturers (3 person), Do during open lesson dan see were followed by 6 to 9 person from zoology related subjects. By the increasing of the observer who responded during open lesson or reflection (see) toward the learning process, then the positive suggestions and improvement were getting more and more (Table 3). This provided chances for model lecturer to improve for the subsequent lesson. In addition to this, the observer from different subjects could learn the weakness and the benefit and also comparing it to usual lesson on their on subjects during class. Lesson Study is a simple strategy to improve a learning process with a collaboration (Lewis, 2002). Therefore Lesson Study could form collegiality and collaboration amongst, the students and amongst the lecturers from closed-related subjects in the same university which is able to be extended to form a bigger learning community

### 3 CONCLUSION

The implementation of Lesson Study with the application of STAD cooperative learning model could increase the learning activities and critical thinking as a result of collaborative-cooperative learning and collegiality amongst lecturers within zoology field in performing Plan, Do dan See during lecturing.

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## The Comparison of Mathematical Understanding and Connection Through Cognitive Conflict of Piaget and Hasweh

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**Abstract:** Cognitive conflict believed as the process of how knowledge is constructed. There are three the cognitive conflict theory, namely Piaget, Hasweh, and Lee. Piaget cognitive conflict is known as cognitive imbalance. According to him, cognitive conflict is built from imbalance between cognitive structures with information coming from it. Equally, imbalance may be occurs between internal structures with external input. Hasweh cognitive conflict is known as metacognitive conflict. According to him, cognitive conflict built from contradiction between old cognitive structures with new cognitive structure or with is being learned. This research tried to compare mathematics abilities (mathematical understanding and connection) through implementation of teaching material design compiled based on the two cognitive conflict theory, namely cognitive conflict of Piaget and cognitive conflict of Hasweh. Result of the research indicates that mathematical understanding and connection ability of student through both teaching material designs does not significantly different.

**Keywords:** Cognitive conflict, mathematical understanding and connection.

### 1 INTRODUCTION

It is widely accepted that understanding is an important part in learning of mathematics. A vast of researches focused and concerned on enhancing understanding in learning of mathematics (Hiebert & Carpenter, 1992). Mayer; Olsson & Rees; Perkins & Simmons (in Hiebert & Carpenter, 1992) asserted that understanding is a fundamental aspect in learning; hence the development of learning model is always related to enhancement of understanding. Thus, mathematical understanding occupies a strategic position in mathematics learning.

Minarni (2013) stated understanding is not independent, but supported and interconnected with all processes in mathematics. For instance, representation of a concept or problem will help one's understanding as it viewed from many points of view. Hiebert & Carpenter (1992) asserted that the ability to relate interconnected mathematics ideas takes part in understanding the ideas. Minarni (2013) identified the poor understanding of mathematics is engendered by student's shortcomings in constructing internal representation of mathematical objects, and portraying mental image into mathematical representation. In addition, Minarni conjectured that the poor of students' ability caused by their weakness in relating internally as well as externally one representation to another, whereas in fact the degrees of understanding is defined by number and strength of the relation. An

idea, procedure or mathematical fact will be fully understood when all the ideas, procedures and facts are interconnected in a network with a number of strong connections (Hiebert & Carpenter, 1992), and as students are able to connect their mathematical ideas, they come to profound and stronger understanding (NCTM, 2000). They can see that with mathematical connection, topics in mathematics are interacted to one another. Thus, a strong relationship between understanding and connection in mathematics is apparent.

Teacher needs to encourage students to use their own thinking strategy to develop connections of their mathematical ideas, synthesize new ideas and procedures based on that ideas with a representation (NTMC, 2000). For instance, students frequently use objects and strategies in enhancing their understanding in addition and subtraction by connecting both operations. Teachers also frequently use addition to help students learn multiplication.

Beside connections in mathematics, students' environment may provide opportunity to learn topics of mathematics. Students' experience at home, at school and the association with their community are good instances to develop mathematics connections. An example suggested by National Council of Teacher of Mathematics or NCTM (2000); position and direction of trip from one place to another may be used to develop geometric ideas of utilization of coordinate to depict location. Moreover, students can be



encouraged to develop map in coordinate system of various routes from home to school. By the map they could determine and compare the distance of the ways they go through.

Both examples described above are the approach which frequently used by teachers in teaching mathematics. When we use conflicts from environment, so that the students understand or learn new mathematics concept, then the conflict presented is Piaget cognitive conflict. In contrasts, if teacher use conflicts from inadequacy of lesson learnt by students in overcome new mathematics problem, it is apparent that the teacher use Hasweh cognitive conflict. The forms of conflicts are briefly shown in figure 1 by Kwon and Lee (2001).

Figure 1. Cognitive Conflict Model (Kwon & Lee, 2001)

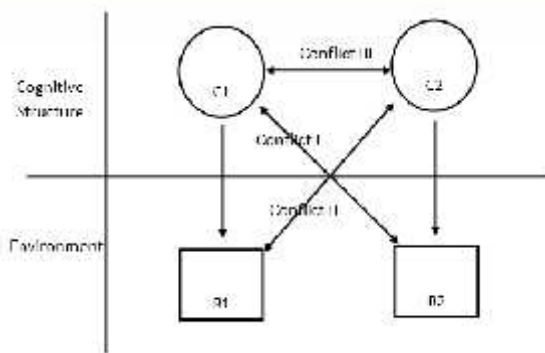


Figure 1 shows the cognitive structure comprises C1 and C2; R1 and R2 show the environmental stimulus. C1 depicts preconception of students which probably is of students' misconception. C2 is the concept to be learned. R1 is the environment which can be described by C1, and R2 is the environment which can be described by C2 (Ismaimuja, 2010). Conflict I is Piaget's conflict, which is between C1 and R2, or between preconceptions of student's environment that can be described by the concept to be learned. Conflict II cited by Kwon, the conflict is between concepts to be learnt from the environment that can be described by students' preconceptions. Conflict III described by Hasweh, it is between students' preconception with the concept to be learned.

Since 1980s the use of cognitive conflict as learning strategy is very popular, particularly in science education (Lee et.al., 2003). Many researchers asserted argumentations about the important role of cognitive conflict in conceptual change. However, the influence of cognitive conflict remains plenty questions. Lee set an example of several types of cognitive conflicts, such as visual conflict, kinesthetic conflict, social conflict between peers and between children and adult (Druyan, 1997), individual conflict and peer conflict (Chan, Burtis & Bereiter 1997). While Zimmerman and Blom (Lee et.al., 2003) examined cognitive conflict assessment which is

focused on two topics; degree of uncertainty and response latency or internal cognitive conflict.

The studies on learning practices with cognitive conflict strategy are conducted in various ways. Watson (2002) finds the cognitive conflict strategy helps reconstruction of students' knowledge. Students are easier to connect knowledge to be learned through this reconstruction. This learning activity provides meaningfulness to the students. In addition, cognitive conflict prevents misconception on the students (Maier in Pathare & Pardhan, 2004). Mosham & Geil (1998) and Kruger (1993) in Prata, et al. al. claimed that productive cognitive conflict occurs in context of cooperative learning, not in competition or interpersonal conflict. Mosham and Geil described that productive cognitive conflict does not occurs in the process of independent thinking, but in collaborative construction of conceiving consensus of a problem solution. This notion is supported by Sutawijaya and Dahlan (2011) that interaction with others is source of the occurrence of cognitive conflict. Dahlan, et.al. (2012) revealed in their research that creative thinking through cooperatively cognitive conflict is significantly better than individual cognitive conflict.

It is encouraging to study whether the model developed by Kwon & Lee (2003) from Piaget, Hasweh and Kwon can be developed partially in subject matter? And is there influential difference on student's mathematics ability? In this study, only two models will be compared, those are cognitive conflict from Piaget and Hasweh. The mathematics ability to be assessed are mathematical understanding and connections.

## 2 RESEARCH METHOD

This is an experimental research that aims to study comparison of mathematical understanding and connection through cognitive conflict of Piaget and Hasweh. Since the researchers did not place students randomly in the class, then this study is a quasi experimental research, with pre-post test control nonequivalent group design.

Sample is selected purposively with consideration that the ability of students in the school where this study is undertaken is considerably equal. The selection of sample is recommended by mathematics teachers who teach in those classes. Two classes are selected as experiment classes. One class used subject matter of Piaget cognitive conflict (experiment 1); and the other class used subject matter of Hasweh cognitive conflict (experiment 2). While the strategy used in both classes is similar, that is adapted from Sugiyatna (2008). The first step is introduction, students are oriented to conflict. In this step teacher

explains learning objectives, the necessary learning source, motivate students to actively engage in overcoming conflict and seek the truth of concept. The second step is organizing students to learn. In this step teacher helps students to define and organize learning task related to the conflict. The third step is guiding students to conduct individual as well as group investigation. In this step teacher encourage students to gather relevant information, conduct experiment, and internal discussion to get clarification and problem/conflict solution. The fourth step is developing and presenting learning products. In this step teacher assist students to planning and preparing learning products and helps students to share learning task with peers. The fifth step is analyzing and evaluating. In this step teacher helps students to reflect or evaluate the investigation and all processes undergone by the students.

In implementation, a collaborative work is conducted by researchers and students who are working on final assignment (thesis). One student conducts research to gather data of mathematics understanding, and one student conducts research to gather data of mathematics connections. Mathematics connection is assessed by instrument with indicator developed by Sumarmo (2002), which is to recognize equivalent representation of similar concepts, recognize mathematics procedure connection of a representation to equivalent representation procedure, to use and assess relation among mathematics topics and relations beyond mathematics, and to use mathematics in daily life. Mathematics understanding is assessed by indicators suggested by Skemp, which are instrumental and relational.

### 3 RESULT AND DISSCUSION

Subject matter of the cognitive conflict in this study is developed based on the model of Kwon and Lee (2001). In Piaget cognitive conflict, a contextual problem from where the students learn new mathematics matter is presented to the students. Here is an example of the problem:

*There are four types of human blood, A, B, AB, and O. If 5 people examine their blood type, then is it possible that two people have similar blood type? Give your reason!*

To solve the problem above, students are encouraged to make possible relations through arrow diagram among five students with their blood types. From that process, it is expected that at least two students have similar blood type. Through the activity students are urged to determine the number of possible relations from set A with  $n$  elements to B with  $m$  elements.

The subject matter of Hasweh cognitive conflict is designed by delivering students to mathematical problem that related to new mathematics matter.

When teacher teaches addition of fractions, For instance, students are asked to determine result of  $\frac{1}{2} + \frac{1}{4}$ , and the students answer by adding the numerator with numerator and the denominator with denominator, so that resulted  $\frac{2}{6}$ . Then the students are asked to simplify it that resulted  $\frac{1}{3}$ . Here the students can see the relation that  $\frac{1}{3} < \frac{1}{2}$ . With this condition, the students undergo a cognitive conflict.

The conflict built from both examples are naturally similar, that is how new knowledge is constructed by utilizing students prior knowledge. As Herbert & Carpenter (1992) stated that network of mental representation occurs through relation process between new information with students' prior information and understanding will grow and organized through the network built. Glaser (Hiebert & Carpenter, 1992) cited that the existence of networks influence quality of constructed relation that help formation of new network.

As described previously, both classes use five steps cognitive conflict learning strategy, which is student orientation on conflict, organizing student to learn, individual and group investigation, development and presentation of learning product, evaluation and reflection.

The observation revealed that from all learning activity in class experiment 1, the third instruction could not conduct learning activity such as presentation, responding and concluding. It occurred because many students did not finish solving the problem presented yet. In class experiment 2 same activities were not conducted in fourth instruction. Thus, it can be concluded that learning in both classes had well conducted as it planned.

As previously described, this research aimed to compare mathematics understanding and connection through cognitive conflict strategy of Piaget and Hasweh. The research is implemented in two different schools for each variable assessed. Hence both variables are not simultaneously discussed. The ability of mathematical understanding result is descriptively shown in table .

Table 1: Descriptive Statistics of Mathematical Understanding Ability

Test	Class Experiment 1		Class Experiment 2	
	$\bar{x}$	S	$\bar{x}$	s
Pretest	5.12	2.06	9.87	2.54
Posttest	51.10	4.48	56.92	3.26
n-Gain	0.49	0.21	0.52	0.15

Table 1 show that initial understanding ability of students in class experiment 2 is better than students in class experiment 1. The distribution in class experiment 2 is higher than in class experiment 1. Hence the initial ability of class experiment 2 is higher but the difference among students is much higher than students in class experiment 1.

The posttest and n-Gain revealed that level of data distribution is shifted. The mean of posttest on understanding ability of class experiment 2 is higher than class experiment 1, but the distribution in class experiment 2 is lower than in class experiment 1. Similar result yielded by n-Gain, standard deviation of class experiment 2 is lower than class experiment 1. Thus, treatment applied in class experiment 2; the Hasweh cognitive conflict has lessen the gap of understanding ability among students in the class. Since the test result on student initial ability of mathematics understanding is different, the n-Gain was employed to examine the influential difference of both treatments on student understanding enhancement. Descriptively, on table 1 we can see that mean of the n-Gain of both classes are similar in qualification, which is middle qualification. Mean of n-Gain for class experiment 1 is 0.49; and for class experiment 2 is 0.51. Table 2 show details of mean distribution of n-Gain of students understanding ability in both classes.

Table 2 Distribution of n-Gain Qualification of Mathematics Understandings Ability

Class	n-Gain Qualifications (g)	Number of students
Experiment 1	High (g > 0.7)	6
	Middle (0.3 < g ≤ 0.7)	28
	Low (g ≤ 0.3)	7
Experiment 2	High (g > 0.7)	5
	Middle (0.3 < g ≤ 0.7)	32
	Low (g ≤ 0.3)	2

On the table we can see that number of student distribution of both classes on each n-Gain qualification is relatively homogenous, with the curve tendency towards n-Gain small. This is proven by the result data normality test, class experiment 1 distribution is not normally distributed. This result implicate that the test the difference of both classes use non parametric test, the Mann Whitney U. The result of Mann Whitney U Test is  $Z = -1.243$ . The Z value is not sufficient to reject the null hypothesis on significance level of 0.05.

The following discussion focused on ability of student mathematics connection. Table 3 show

descriptive statistics of connection ability of both classes.

Table 3 Descriptive Statistics of Mathematics Connection Ability

Test	Class Experiment 1		Class Experiment 2	
	$\bar{x}$	S	$\bar{x}$	s
Pretest	3.42	3.02	5.59	2.92
n-Gain	0.48	0.28	0.57	0.27

The descriptive statistic of mathematics connection ability resembles the descriptive statistic of understandings ability. Mean of initial connection ability class experiment 1 is lower than class experiment 2, but distribution in class experiment 2 is higher than class experiment 1. Data of n-Gain in both classes are slightly different, mean of n-Gain of connection in class experiment 1 is lower than class experiment 2. This also occurs in data distribution, where n-Gain of class experiment 1 is low but slightly higher than class experiment 2. This result is concomitant with findings on students' ability of understanding that students are familiar with problems related to mathematics application in other subjects and daily life. However, from the data distribution is apparent that Piaget cognitive conflict is able to lower gaps among students. This is very rational, because cognitive conflict built in Piaget is initially introduce to the environment or context used as tool to learn mathematics matter. According to NCTM (2000), real world context provide opportunity for the students to relate what they learn with their mind. In addition, it is suggested to deliver students to questions such as: What made you think that? Why does that make sense? Where have we seen a problem like this before? How are these ideas related? Did anyone think about this in different way? How does today's work related to what we have done in earlier units of study?

The following is result of mathematic connection enhancement test from n-Gain data. The test used non parametric statistics Mann Whitney U Test. The selection of this test caused by one of n-Gain distribution data, which is class experiment 2 is not normally distributed. It is gained with probability of null hypothesis rejection only 0.113. Since the probability less than 0.05, and then the null hypothesis do not rejected. It means there is no difference in students' mathematics connection enhancement through both learning.

The findings described above revealed that Piaget or Hasweh cognitive conflict did not result in significant difference on enhancement of understanding as well as mathematics connection. The non existence of difference from both treatments might be influenced by cooperative activity in the phase of cognitive conflict strategy. According to Johnson & Johnson (2000), in cooperative strategy, interactions, sharing and collaboration of students in group brings success to all students. This occurs by sharing of resources ability and encouragement from each group member. There are significant cognitive

activity and interpersonal dynamics so that every student is encouraged to learn.

Consistency of this result needs to be followed by research that concern on factors influence cognitive conflict. As cited by Kang et. al. (2005) that success of cognitive conflict strategy is highly depending on various factors, such as willing and ability of students to recognize conflicts. Thus, Kang et. al. suggest to take logical thinking ability, learning style—classified into dependent/independent fields, and learning approach into considerable factors.

#### 4 CONCLUSION AND REKOMENDATION

Conclusions of this study are as follows:

1. Development of subject matter with Piaget or Hasweh cognitive conflict base is descriptively able to enhance students' ability of mathematics understanding and connection. The enhancement is at middle qualification.
2. Inferentially, there is no significant difference of understandings enhancement between applications of Piaget or Hasweh cognitive conflict. As well as mathematics connection, even descriptively learning with Hasweh cognitive conflict slightly higher, but statistically did not show significant difference.

From the conclusions above we posed some recommendations:

1. The subject matter of Piaget or Hasweh Cognitive conflict can be developed and used by teachers in mathematics learning, so can enhance students' ability of mathematics understanding and connection.
2. The development subject matter for both cognitive conflicts partially is not easy. Hence it is suggested to develop both conflict cognitive collaboratively and concurrence with characteristic of the matter to be taught.

For future research, it is possible to develop qualitative study in development of subject matter through didactic pedagogic theory that accommodate students' learning difficulties and related to other mathematics competency.

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## Teacher's Learning on Seating Arrangement: A Case Study of Assessment in Learning

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**Abstract:** Assessment of learning is often a difficult thing for teachers, one hand a teacher must pay attention to each student's competences will be assessed, while on the other hand it should be kept to facilitate the learning process. Some teachers who are not satisfied that the assessment in learning can be done after it by using teacher's memory on students activities, start to find their own strategy that allows to recognize students from their seating arrangement. This paper examines a junior high school science teacher who modifies seating arrangement during 5 months learning to obtain the most optimal seating arrangement that allows her to conduct an assessment in learning. The teacher has been experienced with lesson study since last 4 years ago. The strategy might be internalized from a case study of student activities in the classroom, but teacher sense and competencies could be developed through learning activities of interaction with colleagues in the teacher professional development activities such as lesson study. Field notes for 5 months during her teaching period in a half academic year on 36 students are investigated and analyzed. How teachers' learn in finding most reasonable seating arrangements for recognizing students learn also discussed here.

**Keywords:** Assesment in Learning, seating arrangement, Lesson Study.

### 1 INTRODUCTION

West Java government did dissemination of Lesson Study for 10 regencies in three years starting in 2011 until 2013. This forum found some teacher's problem in learning process, especially in assessment. According to government law no 19, 2005, one of teacher's duty is assessing of learning. Several reasons found related to how hard teachers to doing some assessment process, i.e. the assessment format is too rigid, difficult to be filled, teachers do not have enough time to assessing, and how hard teachers to be facilitator in learning and to pay attention in student's competence assessment at the same time. That is why teachers did assessment after learning process be done rely on their memory. Meanwhile, in science learning, teachers have to doing assessment in learning process. It is useful to help students get the learning purpose. That is why assessment has to be done together or along with, in learning process either after learning be done.

Regarding to this learning way, it is analogous with Curriculum 2013 in Indonesia which is

emphasizing process, so that teachers must doing assessment in learning process. There are three assessment aspect that must be fulfill in learning: knowledge, attitude and skill. Assessment process can be done in learning process including attitude and skill aspect. In learning process, teachers can assessing student's attitude to get student's attitude profile along with conducting them to change the negative attitude (for example: apathetic, passive, rely on the other team members, etc.) to the positive one. In additional, when learning process is going on, teachers can assessing skill aspect too, such as intellectual skill or psychomotor skill.

Teachers do realize there are some difficulties to do assessment process. Therefore, teacher must learning to find a new strategy which is can helping teacher's duty to be easier to do assessment process. This teacher's ability of course cannot be occur by itself, but through long and continuous process in certain vessel, such as Lesson Study. As an impact of dissemination of Lesson Study, teachers is accustomed to always made some daily notes in learning journal form. Based on this learning journal, teacher can find a new simple strategy to

make process assessment easier to do by utilizing student’s seating arrangement

## 2 ASSESSMENT PROCESS FORMAT WITH SPECIAL TABLE

When learning is taking place in the class, generally teacher stand up in the center of the class. He/she try to be able to see, observe, and communicate with the students during learning. From the teacher’s point of view, teacher can understand which student who achieved the competence and who is not yet. Usually teacher will approaching the problematic students and help them. But this condition is really rare to described in teacher’s finding note and be written in process assessment note. The main cause of this condition is the teachers are not adapting yet to write whatsoever during learning process.

This matter has been a case study in State Secondary School of 52, Bandung. The science teacher who had been teaching for the last seven years, and active in Lesson Study community tried to apply the Lesson Study’s habit in their class. She started to sketch the seating arrangement to identified student’s learning characteristic on the science learning journal. The alteration in this note is keep going on but it always describe the student’s seating position in the class.

When the learning is taking place, surely some point of assessment must be filled up based on anything teacher’s found out in the class. Generally, teacher decide which aspect will be assessed along with it rubric, then teacher will preparing an assessment table which is appropriate with its rubric. Just like explained in Table 1.



Table 1. Process Assessment Format in Force Measurement

Assessment Rubric:

Assessed Aspect	3	2	1
Scale reading	Student’s eyes is exactly in front of the scale	Student’s eyes is not properly enough in front of the scale	Student’s eye is forming a big angle with the scale (Parallax)
Stating the result of measuring	The scale measuring is sketched and marked. The result is exactly valid	The scale measuring is sketched and marked, but the result is not enough valid	Students drew dynamometer scale carelessly, the scale measuring is unmarked, the result of reading measurement is wrong

Table 2. Assessment Documentation Type

Name	Scale Reading			Stating the measuring result			Score	Mark
	3	2	1	3	2	1		
ALDI SURYA K.								
ANDI RAMDANI								
ANITA SETIAWATI								
ANWAR SAEPUDIN								
ARFAN HAMID								
And so on..								

Assessment format above at a glance looks like easy to do and ideal. But actually, this format is difficult to apply. Just imagine if there are 30 more students in one class which is the student’s name had already filled on the list. It makes consequence when the teacher doing some observation and assessing, the teacher need to find student’s name on the list while observing him/her, so that the teacher needs more time to fulfilled the format. This matter makes a problem if the assessing process going on learning process on one table which is prepared to be fulfilled to getting student’s profile. Meanwhile in one meeting, the teacher have to assured the

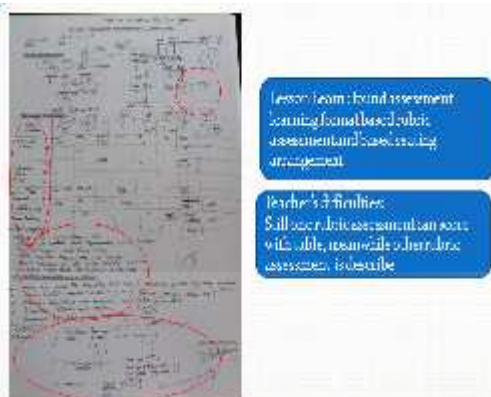
achievement of learning purpose, facilitated the students, and assessed.

The goal research is to describe how teacher find out most appropriate assesment input strategy that allows to recognize students from their seating arrangement as part of her “pushed-out” innovation .

Based on the problem above, teachers need a new strategy to do process assesment, such as attitude assesment, skill process, as well as product assesment in special form. The purpose of this format creating is to help teacher do easier way to filling the assesment data practically just in one paper format for one meeting, and it can be fulfilled in a shorter time along with learning process. Hopefully with this format creation, the teacher can get student’s profile learning, and can be used for whoever need this format without try to finding student’s name in the table of assesment beforehand which is waste more time.



Practically format which is mentioned before means to doing assesment process in the class with sketch of student’s seating arrangement and its “Special Table”. Student’s seating arrangement need to be made because it help the teachers easier to



observing. This sketch is appropriate with the class condition in that meeting. If the seating arranged classically, the sketch drew classically too, then teacher mark the line seating, so that the filling of special table can be observed: which student act active or passive based on the seating line. If the seating arranged as group activity, so the sketch drew appropriate as that condition as well, then mark the group name as necessity. This group seating arrangement sketch help the teacher to observe easily, not only observing the student’s group activities, but also student’s individual activity. Moreover, the special table as mentioned before is containing with some information of assesment aspect and its criteria, along with the student’s name. The teacher named it ‘special table’ because this table can be used teacher’s necessary of assesment for anything: skill process, attitude assesment, or product assesment. The form of assesment process can be seen in appendix part.

How to filled that format?

1. Firstly, make sure the student’s seating position in classically or grouping condition, then draw the sketch, mark the group’s name or line.
2. Make the special appropriate based on teacher’s necessity aspect. It made by teacher’s rubric which is had to be applied.
3. To filling the special table, concern about teacher’s observation aspect. Write down the student’s name, but only the students in 3 category or 1 category. If in one group indicating the same ability for all members, give the checklist mark due to its assesment category. This way make the assesment be more practicable and not wasting much time for assesment in learning.
4. If the raw data in special table had fulfilled, it means assesment process is finished
5. For getting student’s individual assesment, move the data to the process assesment format

The trial of assesment format with the special table above had been done in five months for 6 classes which is consist of 36 students. The result pointed out that, the format is really helping teacher to do assesment process. As a product, this special table also has excellence and weakness reviews. The excellence one is reviewing bellow:

1. Simple, quick, practical, and easy to be fulfilled in the class during learning process
2. Synergy with teacher’s performance
3. Can describe the class’s profile generally
4. Flexible for anything assesment, such as attitude or skill aspect during observation on going



As for the weakness of this format is not describing student's individual score assessment, so that the teacher has to move the data to the basic assessment format.

### 3 CONCLUSIONS

Teachers have to keep learning from the problems which is appeared in learning process. Assessing skill also must be owned by the teachers to do their duty in the class. The assessment process format with the 'special table' can be used by the teachers to help them assessing during learning process.

Assessment process format with special table is a product created from teacher's learning process to do the assessing process easier by using student's seating arrangement. This alteration is important to do as impact of Lesson Study activities for all teachers, especially from dissemination of Lesson Study in West Java, Indonesia.

### ACKNOWLEDGEMENTS

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**APPENDIX 1**

**Assessment Documentation Type**

Class : 8.4  
Day/date :

No.	Name	Scale Reading			Stating the measuring result			Score	Mark
		3	2	1	3	2	1		
1	ALDI SURYA K.								
2	ANDI RAMDANI								
3	ANITA SETIAWATI								
4	ANWAR SAEPUJIN								
5	ARFAN HAMID								
	And so on..								

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**Bandung, January 2014  
Teacher,**

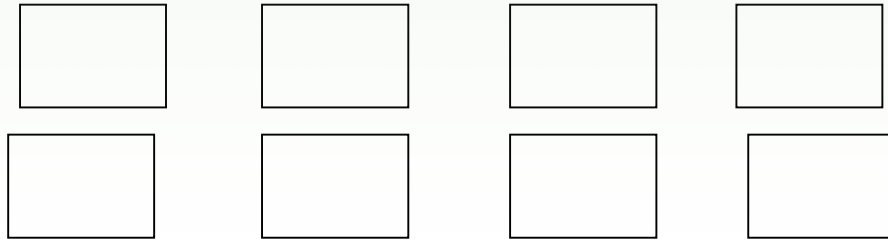
**Titin Supriyatin, S.Pd.  
NIP. 198306272009022002**

**APPENDIX 2**

Day / date :  
Class :

Absence student list :

**Seating arrangement sketch: (this is the example for group activity)**



**Finding in learning process:**

Assessing aspect		1 <sup>st</sup> Group	2 <sup>nd</sup> Group	3 <sup>rd</sup> Group	4 <sup>th</sup> Group	5 <sup>th</sup> Group	6 <sup>th</sup> Group	7 <sup>th</sup> Group	8 <sup>th</sup> Group
	3								
	2								
	1								
	3								
	2								
	1								

## EMPOWERING PRIMARY TEACHERS on CREATING SUB-THEMS of INDONESIA “2013 CURRICULUM”

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### Abstract

In the year 2013 there was a changing curriculum for primary and secondary education in Indonesia, that named “2013 Curriculum”. Due to the curriculum for Primary School, students should be learned through thematic integrative models of teaching. That means the curriculum gave 8-9 main themes for first to fourth grades, and 5-6 main themes for the fifth and sixth grades. Teachers have difficulties in creating sub themes from the particular main themes given in the curriculum, because in ordinary they teach based on topics in seperated subject matter. Teachers training program have been created to solve the problem. The training used focuss group discussion. The discussion meet some rules to create the sub-themes based on subject matter of Mathematics, Science, Social Studies, and Indonesian Language that should be integrated to make the particular main themes, combined with standard competencies and essensial competencies, that deal with learning schedule. The training involved 20 primary teachers from Bandung, Cianjur, and Subang. Result show the training could empowered teacher in the competency to create the sub themes for each lesson plans that could be implemented in schools on each class. It was hope the primary teachers had new competencies in splitting sub themes from the particular main thematic integrative themes to write their new lesson plan models.

**Keywords:** empowering, primary school teachers, sub-themes

### 1. Background

Indonesia’s 2013 Curriculum for Primary School is a new currilum. To create the new curriculum there were many challenges. As internal challeges there should be completed the eight challenges of National Educational Standard, that consist of content standard, process standard, assessment standard, output competency standard, management standard, budget standard, educator and educational staff standard, building and equipment standard. The growth number of Indonesian productive age people on 2020 -2035 will be the next challenge to be a development capital. To change the uncompetent peoples there should be a good education. Therefore the curriculum should be change.

There are many external challenges consist of the next era of globalization : WTO, ASEAN community, APEC, CAFTA, environmental problems, increasing of ICT, the convergent of science and technology, scientific-based economy, emergence of cultural and creative industry, the move of world economy strength, the influence and impact of technoscience, quality, investation, transformation of educational sectoral, matter of TIMSS and PISA. The other external challege from community perception is too stressing in cognitive aspect, too heavy the students load, less of character laden. At the same moment there are development of knowledge and paedagogy that are neurology, psychology, observation based or discovery learning and collaborative learning.

The future competence that should be mastered are communication skills, clear and critical thinking skills,judging ability of moral in the problem, responsibility of citizenship, ability to understand and tolerant to other view, ability to live in global community, ready to work hard, responsibility to enviroentment, have an intellegent according to interest and talent. There were also some negative fenomena, like student fighting, drugs, corruption, plagiarism, examination cheating, social unrest. To face of the challenges the Competency-based Curriculum at 2005 and the Unity Level of Education Curriculum at 2006 should be change. The changes will answer the internal and external challenges, national education goal, and addition of rearrange in thinking profile, management, depth and width of matter, strengtning process, and agreement load. The new curriculum created is the “2013 Primary School Curriculum”.

## 2. The 2013 Curriculum of Primary School Characteristics

The differences of the 2013 Curriculum with the 2006 Curriculum are the competence standard based on the students needs; the content standard refers from the essence competence (KI) that free from lesson; all lessons should contribute to the creation of attitude, skill, and knowledge; the lesson derived from the competence that will be reached; all lesson tight of the essence competence of each class.

In the process of education there are strengthening in scientific approach, using science learning to activate all lesson. Guiding students to discover something, stressing in language in communication skills, bringing knowledge and logical, systematic, and creative thinking. In the evaluation measure level of student's thinking from lower to higher order, stressing on question that need deep thinking (not only recall), measure students' process of working, on only yield of work, using portfolio of students' lesson.

On the primary school the teacher only using teachers' book, thematic integrated approach on one book for all lessons in harmony, using Indonesian language as communication tools and carrier of knowledge. Therefore teachers should not constucting syllabi, looking for book according to lessons, teaching many subjects, using Indonesian language to drag on other lesson to make it harmony, using science to become a discussion.

On the other hand students should not learn many lessons in different way, buy many books and students worksheet. Government have prepared students book for them. The graduate competence of primary schools increase and ballance in the soft skills and hard skills included attitude, skills, and knowledge. All lessons' content derived from competences and using thematic integrated model, therefore all lessons interelated each other and have basic competence binded through essence competence, through scientific approach (observing, questioning, experimenting, associating, and communicating) in cross curriculum or integrated curriculum. The level of students competence are first level of competences for grade 1 and 2; second levels of competences for grade 3 and 4; and third levels of competences for grade 5 and 6.

## 3. The implementation of 2013 Primary School Curriculum

Based on regulation letter of Indonesia Minister of Education and Culture number 57 / 2014 about the implementation of the '2013 Primary School Curriculum' included several issues that describe further.

There are essential competence (KI) included: essential competence of spiritual (KI 1), essential competence of social attitude (KI2), essential competence of knowledge (KI3), essential competence of skills (KI 4); The essence competence is formulated to create basic competence (KD);

Other issue was there are two groups of lesson, i.e. lesson of group A and Lesson of group B. Lessons of group A consist of : Religion and Natural Ability Education, Pancasila and Civics Education , Indonesia language, Mathematics, Science, Social Studies. Lessons of group B consist of : Art Culture and Manual labour learning , and Sport and Healthy Education;

Lengh of study for 1 lesson hours (lhs) is 35 minutes. In grade I there are 30 lh/week , in grade II there are 32 lhs/week, in grade III there are 34 lhs/week, but in grades IV, V, VI there are 36 lh/ week. For grade I- V lesson task minimum 36 weeks effective per year, except on the VI grade is 34 weeks effective/year.

All syllabi are in thematic integrated approach, exopt of the Religion and Natural Ability Education syllabus. Application of the 2013 Primary School Curriculum using thematic integrated approach that integration competence of several subject matters into several themes. In grades I- III compose 8 themes, for each theme formulating 4 subthemes. For grades IV – VI compose 9 themes, which formulating into 3 subthemes. The themes for grade I – III can be seen in table 1 and themes for grades IV – VI can be seen on table 2.

In grade I, II and III Indonesian language role as a carrier of other lesson, basic competence of Science included in Indonesian language and Mathematics basic competences, although social studies was placed in Indonesian language basic competences, to make more contextual (interdisipliner integration).

In grade IV, V, and VI using interdisipliner approach. Basic competence of Science and Social Studies also can be applied by integration with local content. Similarly basic competence of local content also can be integrated to Art Culture and Manual Labour learning, and Sport and Healthy learning.

Table 1. List of Themes for Grade I, II and III

No	Grade I	Grade II	Grade III
1	Myself	Union of life	Propagation of animal and plant
2	My hobby	Playing in my environment	Technology development
3	My activity	My everyday tasks	Changing of nature
4	My family	Me and my school	Environment attention
5	My experience	Clean and healthy life	Traditional play
6	Clean, healthy and orderly environment	Water, world and sun	Beautiful friendship
7	Things, animal and plant on my surroundings	Take care of animal and plant	Energy and its changes
8	Natural phenomena	Safety at home and journey	Earth and space

Table 2. List of Themes for Grade IV, V and VI

No	Grade IV	Grade V	Grade VI
1	Beautiful gathering	Things in the environment	Save the life
2	Always energy retrenchment	Phenomena in life	Unity in differently
3	Care of live environment	Union of social being	Prominent figure and inventor
4	Several work	Health is important	Globalisation
5	My hero	Proud as Indonesian	Enterpreneurship
6	My beautiful country	Human and animal organs	Public health
7	My ideal	Indonesia civilization history	Organisation around me
8	My house	Ecosystem	My earth
9.	Our health and nutritive food	Our invironment friend	Journey to space

In order to search primary teacher idea in applying the 2013 Primary School Curriculum, a study have been done especially in determining the subthemes from the themes prepared. The study have been done using focuss group discussion of 20 teachers from public schools at Cianjur, Subang and Bandung, and also a private primary school at Bandung. The teachers as a group of lesson study with a goal to implement the new Curriculum correctly. The lessons that have been discussed consist of the first semester in grade II and grade V. They have been chosen because the lessons have been implemented at the first time in 2014. In the beginning of discussion there was found that Bandung group teachers only teaching the A group of lesson, and the contrary with teachers of Cianjur and Subang group that teaching the whole groups of lesson (5 subjets in grade II and 7 subjets in grade V). Because of the differences, the whole group of teachers determined to discuss only the A group of lesson on the both grades.

The activity was based on the 2013 Primary School Curriculum manuscript, Teachers’ Guide Books, and students’ Books. In grade II of the 2013 Primary School Curriculum there are 8 themes for a year. Each themes implemented on 4 weeks. Because each themes consist of 4 subthemes, therefore each subtheme implemented on a week. In grade V Primary School there are 9 themes and each themes consist of 3 subthemes. Therefore each themes implemented in 3 weeks plus a week for enrichment or project/ application skills in project-based learning (PjBL). On the first semester there were 5 themes, and on the second semester 4 themes. The subthemes of each theme for can found on table 4 and table 5.

Table 4. Themes and subthemes for first semester on grade II

No	Themes	Sub-themes
1	Union of life	1.1. Union of life at home
		1.2. Union of life with my friends
		1.3. Union of life at school
		1.4. Union of life in society
2	Playing in my environment	2.1. Playing at home
		2.2. Playing in my friend’s home
		2.3. Playing at school
		2.4. Playing in the tour ground
3	My everyday task	3.1. My task at home
		3.2. My task at school
		3.3. My task as religion people
		3.4. My task in social life
4	I and my school	4.1. My task at school
		4.2. My extracurricular
		4.3. My school environment
		4.4. My school prestation

Table 5. Themes and subthemes for first semester on grade V

No	Themes	Subthemes
1	Things in the environment.	1.1. Phase of matter and their characteristics
		1.2. Changing of phase of matter
		1.3. Man and environment
2	Phenomena in life	2.1. Several event of life
		2.2. Important events
		2.3. Man and natural events
3	Union of social being	3.1 Union of life
		3.2 Union of life advantage
		3.3 Care of union of life
4	Health is important	4.1 Importance of own health and environment
		4.2 Profile of health in life
		4.3 Environmental health
5	Proud as Indonesian	5.1 My Indonesia, a wealth nation
		5.2 My Indonesia, a cultured nation
		5.3 My Indonesia, a peace lover nation

The analysis of discussion results on grade II and V, show that for Mathematics lesson all themes and subthemes were relevant. Paralelly with Mathematics lesson, for Indonesian language lesson there were relevant

on themes and subthemes; but mostly some subthemes were not explicit on the basic competence, especially on the texts.

On the contrary in the Pancasila and Civics Education lesson on grade II there were many mismatch of each subthemes, except on subtheme 1.4. The mismatch also exist on the themes 2 and 3, about themes and the basic competences, especially on the basic competence in the subtheme 3.1. The same case also found in the basic competences 3.1, 4.1 for sub-subthemes 3.2 to 3.4. Tema 4 show the same mismatch on the basic competence 3.1, 4.1 for subtheme 4.1 dan 4.3. Many basic competence were find mismatch also on the grade V.

Science lesson on the grade V showed the unpaired of basic competence on subthemes 2.1 to 2.3. For Social Studies lesson on grade V also found many mismatch. Analysis result of the social studies lesson showed the mismatch of basic competence 3.1, 4.1 on every subthemes on the 1 to 5 themes. The result of many mismatch propose the rearrange the subthemes to make the lesson contextually better understanding by the students. Choosing of many subject matter that compose the subthemes ideally by correlated with the basic competence that will be reached by the student. Teachers have to give attention to the depth of the subject matter especially on the grade II, because they were only learn about the factual knowledge. Many difficult concepts had been found in the students' books. Although the fifth grade students learn the conceptual knowledge, they have limitation on reaching the learning resource.

In the implementation of thematic integrated lesson in primary school many integrated models of teaching should be combine not only the content but also included the students' emotional and skills. Based on the teachers' opinion there were two integrated models could be choosen, the webbed model on grade V and the integrated model for the grade II. On each model there should be scientific approach with various activity to make students engaged tightly and develop their cognitive, affective and psychomotor aspects.

#### 4. Result and Discussion

Teachers determined to discuss only the A group of lesson on the both grades. Therefore the lesson plan only consist of 3 subjects for the grade II and 5 subjects of the grade V, Results of study showed that sometimes subthemes greater than the themes. Such as the fourth subthemes on the grade II were greater than those themes. On grade V subtheme 'Several event of life' most greatest than the theme 'Phenomena in life', such as 'Union of life advantage' and 'Care of union of life' to 'Union of social being' theme. These phenomena was not agree with the theory of creating subtheme of the theme (Fogarty, 1991).

There were subthemes not agree with the theme such as 'Phase of matter and their characteristics' and 'Changing of phase of matter' from the theme 'Things in the environment'. Besides there were too philosophical subthemes like 'My Indonesia, a wealthy nation', 'My Indonesia, a cultured nation', and 'My Indonesia, a peace lover nation' that support 'Proud as Indonesian' theme in the grade V. The theme and subthemes likely choose for the higher grade of education according to students' cognitive development, although on the grade V student may be arrived at the operational formal thought agree with students' cognitive development at those ages. (Wadsworth, 1995). This was also not agree with the former idea in the 'Curriculum 2013 for primary school' development that also fit to child cognitive development and the idea on implementing scientific thinking, also critical and creative thinking (Robertson, 1999; 21st century skills, 2008; Dyer et al, 2009; Voogh and Roblin, 2010).



## 5. Conclusion

The 2013 curriculum of Primary School should be applied thematically. Teachers should be empowered to choose the right subject matter and approach to make students learn meaningfully for each grade, especially on grade II and grade V. Twenty primary teachers at Bandung, Cianjur and Subang had been discuss to analyze the agreement of subthemes content with the basic competence. They agree to reorganized the subthemes and choose two kind of thematic models, e.i.webbed and integrated models. In those kinds of teaching models, teachers integrate cognitive, affective and psycomotoric domain, in their lesson plan. The content of students' book should be revised to decrease the depth of the subject matter.

Based on the analysis it should be repaired the teachers' ways of thinking to make students learn meaningfully in the primary school, through creating the new set of subthemes better.

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## The Implementation of Students Achievement Division (STAD) Combined With Lesson Study-Based Mind Mapping in General Biology Course to Improve Motivation and Concept Comprehension of Students in University of Muhammadiyah Malang

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**Abstract:** STAD (Student Teams-Achievement Division) is effective to improve student learning motivation, because STAD gives significance to reward structure as reinforcement towards what have been done by students. The reward is one aspect to increase motivation. Mind mapping is a method to manage information holistically. Mind mapping may be used to: restore information, organize information, make priority, learn to comprehend information within context, conduct a review on learning material, and retain information completely. In order to answer concept comprehension problem, the writer tried to combine STAD model with Mind Mapping. This study aimed at: (1) improving students learning motivation in general biology course at University of Muhammadiyah Malang, as well as (2) improving students' concept comprehension in general biology course at University of Muhammadiyah Malang. This study was a Classroom Action Research (CAR) Lesson Study (LS) based with two cycles. The study result showed that: 1) the implementation of STAD combined with Mind Mapping had a high learning feasibility with these steps (Plan, Do, See) derived from LS that were used for betterment in each meeting, 2) the implementation of STAD combined with Mind Mapping was proven to increase motivation and concept comprehension. For further research, the combination of STAD-Mind Mapping requires clear instructions and a better time management.

**Keywords:** STAD, Mind Mapping, Learning Motivation, Concept Comprehension

### 1. INTRODUCTION

Teaching is about delivering knowledge to students. As the consequence of this definition, students are passive because they tend to only receive information given by their teacher. Therefore, it is a teacher centered teaching (Sardiman, 2001:45). Teachers are aware of their role when they meet their students. To improve the teaching and learning quality, teachers are expected to have skill to select and apply teaching method for effective teaching (Hamalik, 2001). Hence, teachers are seen as agents of modernization in every field of life. The main effort from teacher is through education program for students.

Based on this statement, teaching quality is directly linked to the use of optimal teaching model which means in order to achieve high quality teaching, each education course or subject has to be organized with suitable organizational strategy. In addition, the knowledge should be delivered with proper strategy (Berg in Prayekti, 2006:2).

According to the survey result and the interview with the lecturer of general biology course in University of Muhammadiyah Malang held on September 16-19, 2013, it was concluded that students' activeness and participation in learning process was quite low. There was also a lack of

motivation to do self-learning; students were less motivated to study biology. Studying biology was considered boring because it required a lot of memorizing and complicated processes. Besides, students were likely to become passive and silent during the lesson. When the lecturer asked questions, students gave minimum response. Students had difficulty to connect theoretical concept of biology to the pragmatic application of the knowledge in daily life. When biological problems were introduced, students could not solve the problems. Students' various background study also influenced the knowledge acquisition, as they might come from vocational school majoring in cooking, sport, and so on.

One of the cooperative learning models which have broad application is STAD (Student Teams-Achievement Division) model. STAD is the easiest cooperative learning model compared to the other models of teaching. STAD is proven to be effective to improve students' learning motivation because STAD focuses on reward system as reinforcement tool. The reward itself may function as a motivation booster.

Mind mapping is a teaching method used to manage information thoroughly. Holistically, mind mapping can be used to: keep information, organize information, make a priority, comprehend information in its particular context, review

material, memorize information holistically, therefore, to answer the problem regarding concept comprehension, the writer tries to incorporate the STAD model and mind mapping.

STAD cooperative learning model would be implemented by the use of mind mapping teaching strategy. The aim of this corporation is for students to gain chances to have class discussion in solving the problem in students’ work sheet. Another benefit of using mind mapping will be seen by the time students explain their mind map designed by their group in front of the class. By presenting, students are expected to overcome their low learning motivation and strengthen their concept comprehension. Students are more interested in creative writing technique with colors rather than the boring one. By this collaboration, it is expected that students’ learning motivation can be increased so that their learning outcome improves as well.

Based on this assertion, the writer was interested in conducting a Classroom Action Research (CAR) on the basis of Lesson Study (LS) under the title of “the implementation of student achievement division (STAD) combined with lesson study-based mind mapping in general biology course to improve motivation and concept comprehension of students in University of Muhammadiyah Malang”.

## 2. RESEARCH METHOD

This study was a Classroom Action Research (CAR) based on Lesson Study (LS), conducted in two cycles. In this context, a cycle means a whole set of activities ranging from planning, doing, observing, and reflecting.

The combination of CAR and LS design can be seen in Table 1 as follow:

Table 1. Combination of CAR and LS

CAR	LS	Activities
<ul style="list-style-type: none"> <li>• Planning</li> </ul>	Plan	<ul style="list-style-type: none"> <li>• Identifying problem and its cause</li> <li>• Designing lesson plans/study scenarios</li> <li>• Creating research instrument in the form of observation sheet</li> <li>• Making Mind Mapping scoring rubric</li> </ul>

		<ul style="list-style-type: none"> <li>• Preparing evaluation tool and authentic assessment</li> </ul>
<ul style="list-style-type: none"> <li>• Action</li> <li>• Observation</li> </ul>	Do	<ul style="list-style-type: none"> <li>• Conducting activities as written in lesson plans</li> <li>• Observing students activities as the form of the researcher treatment during the learning process</li> <li>• Using research instrument to measure the achievement in each step of the activities:                             <ul style="list-style-type: none"> <li>- Study achievement sheet of STAD and Mind Mapping</li> <li>- Monitoring sheet for (Plan, Do, See) Lesson Study</li> <li>- Observation sheet of students motivation</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Reflection</li> </ul>	See	<ul style="list-style-type: none"> <li>• Analyzing the observation result based on reflective discussion and collected instrument</li> <li>• Offering feedback from the observer for lesson plan betterment and for further cycle improvement</li> </ul>

This study was conducted in Biology Education Department, University of Muhammadiyah Malang, Academic year 2013-2014, on odd semester, September-November 2013. The study subjects were students of B offering who were

taking General Biology course in Biology Education Department at University of Muhammadiyah Malang academic year 2013-2014. The total participants were 42 students.

This study was a Classroom Action Research-Lesson Study that was conducted collaboratively. Cycle I consisted of two meetings and each meeting comprised *Plan, Do, See* stages. Cycle II consisted of two meetings and each meeting also comprised *Plan, Do, See* stages.

The data collection techniques were observation, motivation questionnaire, and concept comprehension scoring rubric.

The data analysis technique was a descriptive quantitative based on the available formula as below:

a. Observation Analysis

The data from the observation were analyzed by describing the activities done during the lesson.

b. Students' motivation questionnaire analysis

Students' motivation was measured by motivation questionnaire, where the scoring criteria involved:

- Absolutely Agree
- Agree
- Disagree
- Absolutely Disagree

The total score derived from the students in the scoring rubric for creative thinking would be converted in percentage, by applying the following formula:

$$\% \text{ motivation} = \frac{\text{obtained score}}{\text{total score}} \times 100\%$$

c. Concept Comprehension Scoring Analysis

Students' concept comprehension was measured by essay test and mind mapping result; the following was the scoring criteria:

$$\% \text{ concept comprehension} = \frac{\text{Test Score per cycle} + \text{Mind mapping}}{\text{total score}} \times 100\%$$

### 3. RESULT AND DISCUSSION

The CAR Lesson Study based activities were conducted in two cycles, cycle I and II, where each cycle consisted of two meetings. Cycle I was done in two meetings on Tuesday October 8 and 16, 2013. The main learning material was Bio-molecule and living creature characteristics.

On Tuesday October 8, 2013, the study was conducted in 3 x 50 minute period. In the first meeting, the introduction began with exploring the knowledge of human origin, about living bio-molecule through probing and staging questions. The lecturer played a video on biological molecular

structure and function, and then he/she showed a picture on his/her PowerPoint slides about macromolecular while asking “What is this picture about?”, “Why do scientists study macromolecular?”

The lecturer asked students to sit in groups as many as 6 groups. He/she distributed the work sheet and asked students to conduct group discussion and to answer the problem in a mind mapping. During this activity, the lecturer observed the learning of each group and guided them in discussion part. When the group discussion and mind map drawing finished, they pasted the mind mapping on the white board. Afterwards, the lecturer chose one mind mapping which represented the most comprehensive concept to be discussed all together. The next phase was question and answer session among the groups based on the presentation. The following activity was a game in which students were asked to directly answer the questions delivered by the lecturer.

The lecturer provided conclusion for the given material and informed students the following week's material on making resume about living creatures. The observation result showed that students were quite able to follow the lesson, they were enthusiastic, and they were also highly motivated due to the use of game during the lesson. Students were able to study appropriately, however, some students sitting at the back row seemed to be busy while following the lesson stages; they still gossiped to each other. The predicted cause of the behavior was that students had covered the material before; therefore, one of the suitable efforts for the lecturer to overcome this problem was to give more strict instruction or warning so as students followed the activities more seriously. The lecturer should be able to control the class. Another point was that the use of mind mapping could improve students' motivation to stay focus during the lesson. Time management should be considered by the lecturer as well.

In the second meeting, the class was conducted similar to the previous week that was to divide the class into groups, to discuss the material in groups, and to draw a mind map based on the discussion result. In the second meeting, students were identified to be more focused; only some groups did not stay focus. Students' motivation was increasing; students were used to making the mind map. The following description was the observation result from the second meeting: the 'do' activity had been conducted smoothly; students were motivated in following the lesson. It was proven by students' willingness to bring textbooks related to the lesson, their willingness to work in groups, and they were more focused on studying although some students did not fully fit the proper condition. By

video broadcast and mind mapping, it was expected that students were helped in comprehending materials. In the beginning of the cycle, students might be less passionate due to the extra assignment loads from other subjects.

In cycle I reflection, students were highly motivated. This condition was correctly predicted since they were semester 1 students, so that their passion to join and participate in activities during the lesson was quite high already. Hence, the model lecturer should find a suitable assignment construct to give more motivation during apperception or whilst activities. In this stage, students' concept understanding was quite low but their creativity for mind mapping was excellent. Therefore, the solution for the model lecturer was to manage time allotment to give proper concept emphasis on the material. In order to comprehend the resume assignment concept, structured or outlined assignment points should be previously determined to keep the students' focus in understanding the concept. Students had enough courage to express their opinions, but they often felt in doubt and were afraid of making mistakes. It was a job for the model lecturer to motivate students to eliminate their doubt and improve confidence to state their opinions.

Cycle II of CAR-Lesson Study based was conducted in two meetings; they were on October 23 and 30, 2013. In the third meeting, apperception activity was to be the focus, so as to motivate the students. The writer also paid more attention to time allotment and game which was designed for the whole groups, not only for several groups. The model lecturer applied STAD combined with Lesson Study-based mind mapping.

In pre-activities, the lecturer greeted the students while asking if they were ready to start the lesson. Some students indicated their less readiness to receive material as they were busy doing some assignments from other lecturers. The model lecturer kept on motivating students to follow the lesson. In the next step, the lecturer delivered materials and broadcasted a video as a-perception; the broadcasted video was about cell movements from various kinds of cells. The lecturer asked some questions, “What can you find from the video? What kinds of activities you notice? Explain the definition of cells based on your understanding related to the previous video”. It was expected that students answered all the questions thoroughly and the lecturer proceeded to explain the objective of today's lesson.

The lecturer asked students to sit in groups as many as 6 groups and distributed the work sheet to each group. They started the discussion and drew their answers in mind mapping. During this period, the lecturer observed students' work and guided

students in discussion session. The group which finished the mind mapping might paste their work on the white board; the lecturer chose the most appropriate mind mapping and appointed the group to lead class discussion and question and answer session. Afterwards, students played game by answering some questions from the lecturer directly.

In the third meeting, students gained focus towards the materials, there was an increase in group work, they were enthusiastic to follow the lesson but there were some students who were still passive and lack of seriousness in designing a mind mapping. The predicted cause was the lack of class control from the lecturer; more strict treatment and distributive control should be performed by the lecturer. The reflection result from that meeting gave the writer plenty of lessons on the importance of motivation for students as well as the significance of time management in a course.

In the fourth meeting in cycle II, the material was about cell division. In this session, the lecturer paid more attention to students' concept comprehension by presenting a video with appropriate time duration to avoid boredom. The result showed that students comprehended the concept more after the video broadcast and there was also an indication of creativity improvement.

The reflection result showed that apperception was required to motivate students to join the lesson and to assert the material concept.

Learning implementation reflection captured the achievement of STAD learning combined with mind mapping. The reflection proved that this combined teaching method could increase students' motivation and their concept comprehension. The most highlighted point was to witness students' self-improvement through the implementation of the combined method. This success could be achieved with the help of other lecturers as observers who always gave constructive suggestions and criticisms.

### **a. Students Learning Motivation**

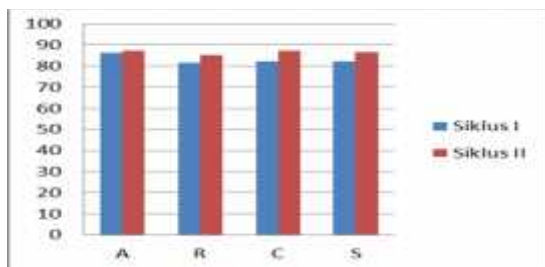
The data of students learning motivation was derived from learning motivation questionnaires that were designed based on motivation improvement strategy (ARCS model). The analysis was done by calculating the score of each aspect, and after the calculation, the scores were classified into five categories; very poor, poor, fair, good, very good. By the end of the calculation process, classical scoring classification was performed to find out classical score for holistic assessment of motivation. The questionnaire result after the treatment in cycle I and II for B class, Biology

Education Department, University of Muhammadiyah Malang can be seen in Table 4.1.

Tabel 4.1 The Mean Score of Motivation Aspect (%) per-cycle and its improvement for students of B class, Biology Education Department, University of Muhammadiyah Malang.

Motivation Aspects	Cycle I	Cycle II	Improvement (%)
A	86.2	87.4	1.2
R	81.73	85.38	3.65
C	82.17	87.40	5.23
S	82.27	86.63	4.36
Categories	Very good	Very good	

Based on table 4.1, there was significant improvement for classical students' motivation by the use of STAD model combined with mind mapping. The analysis result of students' motivation questionnaires showed that, in every aspect, students' motivation grew and increased, in line with the expected achievement set by the researcher. The expected achievement was a cooperative learning activity through STAD learning combined with mind mapping to increase students' motivation in learning biology. The increase of students' motivation can be drawn in a graph in Picture 4.3.



Graph 4.1 Students' Motivation Improvement from Cycle I to Cycle II

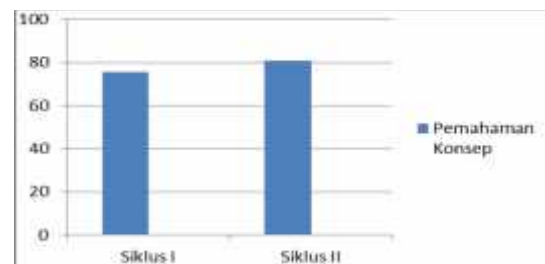
### b. Students Concept Comprehension

STAD learning combined with mind mapping could increase students learning result. This concept understanding can be derived from the test score in Cycle I and II.

Tabel 4.2 Percentage Data of Students Concept Comprehension for B Class, Biology Education Department, University of Muhammadiyah Malang

Objectives	Cycle I	Cycle II	Improvement (%)
Concept comprehension	75.5	80.6	5.1
Score conversion	B+	A	

Based on table 4.2, it was stated that the improvement percentage was 5.1 %; however, if it was converted into score, the improvement was significant especially for concept comprehension. The analysis result based on concept comprehension scoring rubric showed that the result was in line with the expectation of the researcher. Cooperative learning activities by the use of STAD learning combined with mind mapping would increase students' motivation in learning biology. The improvement of students' concept comprehension can be described in Graph in Picture 4.4.



Graph 4.2. The Improvement of Students' Concept Comprehension from Cycle I to II

## 4. CONCLUSION

- Based on the implementation of STAD combined with mind mapping, there was an increase in students' learning motivation for B class, Biology Education Department, University of Muhammadiyah Malang with the following details: Attention improvement (1.2%), Relevance improvement (3.65%), Confidence improvement (5.23%), and Satisfaction improvement (4.36%).
- Based on the implementation of STAD combined with Mind mapping, it was concluded that this method could increase students' concept comprehension, especially for B class, Biology Education Department, University of Muhammadiyah Malang with the following details: Cycle I: 75.5, and Cycle II: 80.5; therefore, there was 5.1 increase in comprehension.

## 5. SUGGESTIONS

Based on the conducted research, several suggestions need to be proposed:

### a. For Lecturers

The implementation of STAD combined with mind mapping needs clearer instructions in order to be easily understood by the students for meeting the effectiveness purpose.

### b. For Students

Students should work in team and minimize individual work. Students should submit the group work results on time. Students should not feel shy and in doubt to ask questions if there is any information they do not understand during the activities.

### c. For Further Researchers

The implementation of STAD combined with mind mapping should be improved; in this study, only two cycles were performed by the researcher with a lot of changings in developing mind mapping; hence, it is recommended that lecturers or teachers be more creative in designing mind mapping.

If this combined method is implemented, it is better for the researcher to pay more attention to time management.

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## Do Students Really Performed Like a Scientist? *Using Students Feedback to Improve a National Curriculum*

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**Abstract:** There is a gap frequently found among curriculum at national level with its implementation in to the classroom. Japanese lesson study as an activity for teacher to learn more about students' learning might also be utilized as teachers' media to formulate a feedback to improve implemented curriculum from classroom activities. The paper studied a case of the implementation of the new science curriculum in the junior school classroom during six months in Indonesia which started the wave since 2013. The research focusing on one of striking point new science learning according new curriculum i.e.: adopting how scientist works using a scientific approach. A science teacher with 5 years experienced of lesson study voluntarily to teach as what is recommended in the student and teacher books. A total of approximately 27 daily classroom learning videos obtained, transcript and analyzed. Focus group discussions which emphasized on students response conducted after analyzing each video, read the transcript, and looks back at the student book and teacher book used. Feedback from teachers regarding how scientific approach should be should be presented at each meeting is categorized to gain the concepts of teacher feedback from students' response to the national curriculum. Suggested results in one semester to the student and teacher's book then analyzed and discussed here.

**Keywords:**

### 1 INTRODUCTION

Formal learning in school is one of the most important part in the development of human resources. Learning activities in Indonesia is guided by a curriculum that is updated regularly and the results of the previous curriculum evaluation. Currently, renewable curriculum which is being implemented in Indonesia is the Curriculum 2013.

Curriculum 2013 is designed to strengthen students' competencies in terms of knowledge, skills and attitudes intact. The competency of curriculum 2013 on the domain knowledge using the scientific approach is characterized by the presence of the 5 M, observe (Mengamati), ask (Menanya), try (Mencoba), reasoning (Menganalisis), and presents/concluded (Menyimpulkan). The curriculum requires students to actively participate in the learning process. Learning activities brought near the student center, which overall was students who actively participate in learning activities and the teacher acts as a facilitator only. So that students are required to learn on their own, but in accordance

with the scientific attitude. To strengthen the scientific approach, the government prepared a syllabus-based learning and books disclosure/research (discovery/inquiry learning) with a textual approach. The 2013's book curriculum consists of student's books and teacher's book. This handbook is given by the government as a reference implementation in the classroom.

Scientific approach is needed to foster students' ability to think, work and scientific attitude and communicated as an important aspect of life skills, application integrated in various models, strategies, methods and approaches to match the characteristics of science learning. Its application can be through operational process skills such as Finding problems, formulate hypotheses, designing the study, collecting data, analyzing the data, and make conclusions. All of this in the form of government is preparing the syllabus and books in order to equalize the minimum learning throughout Indonesia.

Lesson plan prepared by the government is a new thing in Indonesia, so will many shortcomings findings when its execution. So the government help



the learning implementers to provide suggestions for improvements and suggestions to improving the quality of teacher and student book, it is mentioned in the preface to the book the teacher.

This research was carried out by implementing the learning process in science subjects in accordance with the teacher and the student handbook, 2013. Implementation of curriculum learning process according to the book of teachers and students is done for the purpose of reviewing how far the influence of learning made by the government and the influence of the use of the book teachers and students to the scientific attitude is formed on students.

## 2 RESEARCH METHOD

This research was conducted in grade VII in one of the Junior High School in West Bandung regency, precisely in SMPN 1 Lembang 7G's class where students tend situation and characteristics kinesthetic, noisy and do not want to silence, the number of students in class is 41 people consisting of 18 men and 23 woman. The study was conducted during the first half of the subjects of Natural Sciences. Video analysis of qualitative descriptive study conducted by researchers as the main data of scientific research on students' attitudes formed through the implementation of the student book and teacher books based curriculum 2013. Interviews and deployment of instruments into one of the data. The results of this study are expected to provide an overview and make a recommendation to the teacher books and book-based curriculum students in 2013.

## 3 RESULTS AND DISCUSSION

The Implementation of the student's book and teacher's book based on the curriculum in 2013 has made the students learn actively. While the function of the teacher is as a facilitator to help the students to engage in inquiry-based learning or discovery learning. As well as the first chapter in a junior high school science teaching materials about the scientific method that helps students improve the ability of observation, interfere, and communicate. However, the scientific attitude in students formed uneven in every aspect. Scientific attitude of students was very evident during the learning process in the form of experimentation.

The dominant scientific attitude that formed in students is observed, student curiosity it high when

it comes to this process. Usually, High curiosity make student do experiments out from the procedure that given by the teacher, they do in order to get results that can expand their knowledge or even otherwise only hinder the time because according to age is still happy to play that instrument or experimental material was used as a toy. As an example when the teacher forbids to taste acidic and alkaline materials when teaching acids and bases (video lesson # 17), most of the students want to know the taste of sour taste or not, and the end of the lesson students easily determine other fluids whether acid or base based on the taste of the liquid. Students were very enthusiastic when observing like When The learning is to observe the nature of plants, flower's Fahmi is dismantled in order to see the flower like petals, pistil, petals etc., But there are students who are not enthusiastic when observed, it is because the instruction book is assigned only use a magnifying glass to see it. Ask very rarely seen, most will ask only for clarity of experimental procedures or tasks to be performed in the study. Besides, ask the student will still be covered content. Besides, the learning goals of students to asking are still not very visible so that teachers should continue to provoke so that students dare to ask, especially in the preliminary event. Average courage students inquire correctly emerging in core activities, both at the time of the experiment or group discussion, there is a student who dared to ask when the teacher approached the group discussion, there are some students who shouted from his seat serviced immediately ask the question, even exist also students who without hesitation toward the teacher to ask about things that are poorly understood. That is because the habit when elementary school students to ask still lacking and very difficult students can ask well only in short implementation time.

Scientific attitude tried very rarely done, because some experiments require a measuring instrument and the object to be measured as well as the preparation of teachers to be mature. But the increasing scientific attitude trying is easily to be seen, it can be seen from the students who do not shame if he did or not, most of the students are embarrassed because the number of students who pay attention, but when the group season, the student is not depressed because being seen for those students. Overall the students are not shy to try out

when most students are grouped and embarrassed when trying to forward.

Reasoning is a scientific attitude depends on the learning process, Fahmi who usually just playing around but actively answer can answer "for oily hair mam" for question "why hair shampoo give lemon extract?" where other students are not answered correctly, such as vitamins D, dust, dander, and others. While hard scientific attitude to be formed during the process of implementation of teacher and student books book is conclusion. Most students still difficult to draw conclusions from the activities that have been carried out. So in conclusion, the role of the teacher in learning is very dominant, and students get conclusions from the guidance of a teacher who is constantly striving to direct for students to get conclusion from the results of its activities. The process of making inferences during the discussions is stuck because of many opinions of members of the group but which the student confusion ensure proper to be taken as a conclusion on theirs group, so they need for consultation to teachers, at this time that teachers act as servants both for individuals and groups. In some activities of the students scientific attitude, the form of presenting the results of experiments that have been done or the results of observations that have been observed, is still dominated by certain students who already have a degree of confidence that more than any other of his friends, so it looks still students that the same thing the scramble appear communicate study results.

Thus the role of the teacher as a facilitator is needed to direct that such students can be facilitated to re-focus on the purpose of the current study was to without prejudice to the sensation for fun (found in video # 5, Fahmi damage the flowers that should be used to analyze the body part of interest) that on materials or tools is can be played but by meaning as learning.

Additional notes found in interviews and dispersive instrument with a question:

1. How is the experience when learning science during the semester in grade 7?
2. How comment each chapter, the most difficult and the most easy to learn?
3. How do students of teachers in the teaching material during the semester chapter 1?
4. What makes the students do not want / trouble to ask questions to the teacher during the lesson?

5. What factors make it difficult if you have to summarize the results?
6. What advice / do you think about the last semester book?

We obtain results of student responses as follows:

Nu mb	Good Responds	Bad Responds
1	<ul style="list-style-type: none"> <li>➤ It helps much</li> <li>➤ Easy to learn</li> <li>➤ Feels happy</li> <li>➤ Found so many new things from the games and video</li> <li>➤ Feels happy when studying in Laboratorium</li> <li>➤ It contains a lot of formula that can helps to solve a problem</li> </ul>	<ul style="list-style-type: none"> <li>➤ It is bored</li> </ul>
2	<ul style="list-style-type: none"> <li>➤ Bab 1 (The Object of Science and its observed) is easy to learn</li> <li>➤ Bab 2 (The Classification of Object) is easy to learn</li> <li>➤ Bab 3 (Classification of Living Things) some of the picture is unclear so it's hard to learn. But for some student it's still easy to learn</li> <li>➤ Bab 4 (Life Organization system) some student said that it is hard to learn, and the rest of it said that it is easy to learn.</li> <li>➤ Bab 5 (The Changing Matters) is easy to learn.</li> <li>➤ Bab 6 (Energy) some student said that it is hard to learn, and the rest of it said that it is easy to learn.</li> <li>➤ Bab 7 (Temperature and its change) some student said that it is hard to learn, and the rest of it said that it is easy to learn.</li> <li>➤ Bab 8 (heat and its process) some student said that it is hard to learn, and the rest of it said that it is easy to learn.</li> <li>➤ Bab 9 (Environment interaction) some student said that it is hard to learn, and the rest of it said that it is easy to learn.</li> </ul>	
3	<ul style="list-style-type: none"> <li>➤ Easy to understand</li> <li>➤ A lot of experiment</li> <li>➤ Exciting</li> <li>➤ The teacher is exciting</li> </ul>	<ul style="list-style-type: none"> <li>➤ Unclear</li> <li>➤ The experiment is hard to understand</li> <li>➤ Sometimes the explaining of teacher is hard to understand</li> </ul>
4	<ul style="list-style-type: none"> <li>➤ Lake of concentration</li> <li>➤ Lake of confident</li> <li>➤ I don't know what to answer</li> </ul>	

Nu mb	Good Responds	Bad Responds
	➤ Too noisy	
5	<ul style="list-style-type: none"> <li>➤ Add the materials</li> <li>➤ It's not clear</li> </ul>	<ul style="list-style-type: none"> <li>➤ Got the disturb from others student</li> <li>➤ Failed in the experiment</li> <li>➤ Sometimes, it's hard to understand</li> <li>➤ The formula</li> <li>➤ Too much steps on experiment</li> </ul>
6	<ul style="list-style-type: none"> <li>➤ It has been completed</li> <li>➤ Easy to learn</li> <li>➤ Makes happy</li> <li>➤ Make it clearer</li> <li>➤ It's better to give an answer sheet in the book</li> <li>➤ Too much formula</li> </ul>	<ul style="list-style-type: none"> <li>➤ It's big</li> <li>➤ It's heavy</li> <li>➤ The pictures it not clear</li> <li>➤ Too much formula</li> </ul>

From the results of student responses, can be analyzed that:

1. Learning in accordance with the teacher guide book / the government suggest, can be said to be good, fun, easy, and invite curiosity to know.
2. Any material that is easy or difficult by all students or easy and difficult for most students is a normal, because every student has an interest different. Difficulties students will not require a material change material, but can be changed from the model or method of learning. But for that chapter 3, where the picture is unclear and incomplete is important for repair.
3. Student responses will be "teachers sometimes do not understand" and "not clear" can be nothing if the existing teaching materials to teachers book complete and clearly written.
4. It clear that students are not familiar with asking skill. The process needs to be sharpened continuously ask, so that at the next level, students are used to question.
5. Similar to ask activity, concluded looks students are not familiar with this activity.
6. For a physical book, students is hard to bring the book because it size and weight. the image must be fixing by student responses "suggest clarified again" and "the picture is not clear", while student comments "many formulas that do not understand" probably because students do not understand the material.

#### 4 CONCLUSION

Based on the study findings, we suggest:

1. Observing not only observe from the outside (see picture / movie), but observed by holding directly and do something immediately. Students may be assigned to carry the tools / items available daily life in accordance with the content of these subjects.
2. ask is not easy to be improved, there needs to be a long process and just need to give a clue to the trigger. Such as flowers after the observation, the teacher gives the clue "look at the flowers" and students are expected to ask about what was found in the flowers.
3. Trying is not only at the time of the experiment course, students are guided to try everything, like trying to move forward, trying to ask, trying to be the leader of that nature can be reduced afraid to try.
4. With the questions according to the context of learning and life, students are expected to think with his reason.
5. Remind the students that the conclusion is the answer to the problem.

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## The Lecturer Assistant in Student of Midwifery Clinical Practice of Yogyakarta Midwifery Academy in The Year of 2013

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**Abstract:**

Clinical practice for midwifery students aimed to achieve nine midwifery competencies. The process of consultation on practice field is very important for students. Yogyakarta Midwifery Academy innovate the consultation model of clinical practice to help students' learning process in practice field. Students receive consultation from Clinical Lecturer Assistant in giving midwifery care. The evaluation of students' consultation process by Clinical Lecturer Assistant is needed, as a tool to improve learning quality of clinical practice in the practice field. This study aims to find out the consultation process that has been done by Clinical Lecturer Assistant, to find out students perception about Clinical Lecturer Assistant, includes: The important of Lecturer Assistant for student, the students' comfort that consulted by Clinical Lecturer Assistant, and the easiness for students on the consultation process in practical field. The research method is quantitative and qualitative method with case study plan and descriptive. The analysis part is education institution Diploma of Midwifery. Research conducted in Yogyakarta Midwifery Academy in the area of Bantul district. The subject of research is 120 students. The sampling method is simple random sampling. The data collection are questionnaire and Focus Group Discussion (FGD). 90.83% students said that the Clinical Lecturer Assistant appearance convince, 85.83% students said that the consultation model is very clear, 95% students said that they always conduct feed back for students, and 92.5% students said that Clinical Lecturer Assistant are regularly monitor students' attendance during practice process. Based on the interview, some students said that Clinical Lecturer Assistant is very important in assisting process during practical learning in field, learning process in field, solve problem if there any problem found in practice field, and students are easier in conducted report consultation process of midwifery care.

**Keywords:**

Lecturer Assistant, Midwifery Clinical Practice

### 1. INTRODUCTION

Based on data from the Indonesia Demographic and Health Survey (IDHS) in 2007, the number of MMR numbering 228 people out of 100,000 births. This figure is 20-30 times higher than the MMR in Malaysia and Singapore. Based on IDHS 2012, the average maternal mortality rate (MMR) was recorded at 359 per 100 thousand live births. Mortality rate is much increased compared to the results of the IDHS 2007 reaching 228 per 100 thousand.

In order to focus on accelerating the achievement of MDG 5 of improving maternal health, it takes efforts effectively, efficiently and consistently from all stakeholders to come together in its efforts to accelerate the reduction in maternal mortality rate (MMR). To achieve that aim, the Indonesian Ministry of Health arranges the Action Plan to Accelerate MMR Decline years 2013-2015, with the purpose of: describe the vision, mission, and programs are guided by the President and the

National Long Term Development Plan (RPJPN) 2005-2025.<sup>1</sup>

Midwife is a woman who has graduated from a midwifery education recognized by the government and professional organizations in the territory of the Republic of Indonesia and has the competence and qualifications to be registered, or certified and legally licensed to practice midwifery.<sup>2</sup>

In Indonesia, the scope of practice, authority, and competencies that must be mastered by midwife are very extensive. Midwives have a responsibility in health services for mothers and newborns, family planning, child health and primary health care. So the midwife has a very big role in efforts to accelerate the reduction in maternal and infant mortality.

Yogyakarta Midwifery Academy Midwifery is intended to imprint professional midwives and independent. According to Diploma of Midwifery curriculum, students are prepared to become professional midwives who have the intellectual ability, attitudes and skills, so that they can provide

safe midwifery care and satisfactory for mother and baby, their families and communities. In line with these objectives, the teaching and learning activities carried out by the method of learning theory, lab, and clinical practice in the field.

Teachers commonly called faculty is one of the main factors that directly contribute to improving the quality of student. Faculty workload includes the main activities, plan teaching and learning, implement learning process, an evaluation of learning, guiding and training, conduct research, perform additional duties, and community service.<sup>3</sup> The number of workloads that taken by lecturer causing lecturer can not focus in doing every single work, especially in teaching and learning process in obstetrics clinical practice on field. Therefore, Yogyakarta Midwifery Academy has innovation to assist the faculty by recruiting alumni to become an Assistant Lecturer. During the implementation process of learning Midwifery Clinical Practice, students get guidance of Assistant Lecturer in midwifery care act. Field guidance process is very important for students to achieve midwifery competency that has been determined and listed in nine midwifery competencies, so it is necessary to evaluate the guidance process by Assistant Lecturer, as a means to increase or improve the implementation process of clinical practice in order to give better guidance for students.

From this study it can be proven that lecturer assistants are able to give guidance for students during midwifery clinical practice, students have a very good perception to lecturer assistant, and feel more comfortable and easier in clinical midwifery practice guidance on field.

## 2. RESEARCH METHOD

The method that used in this research are quantitative and qualitative methods using a case study design and descriptive nature. The experiment was conducted in the month from October to November, 2013, at the Yogyakarta Midwifery Academy. The unit of analysis in this study is the fifth semester student of Yogyakarta Midwifery Academy.

The subjects were 120 students. Data were collected by simple random sampling using a questionnaire, and through Focus Group Discussion (FGD).<sup>4</sup> Qualitative data analysis was done by using explanation (eksplanasi building), presenting a summary of the data population data in tabular form.<sup>5</sup>

## 3. RESULT

### 3.1 Guidance process for the midwifery clinical practice students done by field lecturer assistant

The guidance process for the midwifery clinical practice students done by the lecturer assistant can be seen on table 1 below:

Table 1.1 Frequency Distribution of Student Answers to the Process Guidance taken by Field Lecturer assistant

No	Questions	Answers (n=120)	
		Yes	No
1	The lecturer assistant was looked convincing in delivering guidance	109 (90,83%)	11 (9,1%)
2	The way or method given by the lecturer assistant during the field guidance gave me a clear view	103 (85,83%)	17 (14,16)
3	The lecturer assistant was always gave evaluation after the guidance by giving suggestion about our field clinical practice that we have done	114 (95%)	6 (5%)
4	The lecturer assistant monitored my presence during the field practice and asked me about problem that we had	111 (92,5%)	9 (7,5%)

### 3.2 The importance of faculty assistance

Most students assumed that the lecturer assistant is needed in field clinical practice. Lecturer assistant was considered very beneficial in the field learning process, especially in providing guidance for action obstetrics. Lecturer assistant always have discussions with students and evaluate any actions taken by students, so that students know the advantages and disadvantages of the current practice. According to students, this is important because the results of the discussion and evaluation of results provided by the teaching assistant can be used to make improvements in the next field practice. As expressed by the following respondent:

*I think it is very important to have a lecturer assistant, of course that she/he is very helpful in guiding us in clinical practice learning. Lecturer assistant are also very attentive to us. More discussions, and always give a complete evaluation at each visit to us, so we know the point that we do not understand, and that we make as input for further action during our practice”*

Other respondents said that the teaching assistant was also gave a better supervise to the student during practice. During this field clinical practice, the students lack of monitoring from the supervisor. Respondents also said that lecturer assistant are very helpful in the implementation of the comprehensive exam, in which students are required to perform this test care to pregnant women, maternal and mothers during childbirth. As expressed by the following respondent:

*“Alright, lecturer assistant were also more able to monitor us, because the supervisor lecturer was just like a brief-monitoring, now we have more time. Besides when we conduct comprehensive exam are easier and faster, because assistant lecturer have more time than lecturer. In fact more time is now right? Moreover, when we want to do a comprehensive exam, it is more easily and quickly for us to do that because the more time that lecturer assistant gave to us. Sometime it was very hard to make a appointment with lecturer, even sometime we faced into annulment. You know, students and lecturer have different times or activities, something like that”*

### **3.3 Students’ pleasure in lead lecturer assistant**

Comfort becomes very important in terms of the guidance in field midwifery clinical practice. Students feel more comfortable with the guidance given by lecturer assistant than with lecturer because there is no awkward feeling as if doing counseling with the lecturer or supervisor. Students feel freer recounts, because age is not too different between the lecturer assistant and students. As expressed by the following respondent

*“Obviously that it is easier to talk with the lecturer assistant because our ages are not too different. Of course the things going so different if we have guidance from our supervisor. Sometimes we are afraid or shame, so for me, it is much more easier to face the lecturer assistant than the supervisor”*

### **3.4 Ease of Doing Tutoring in the Field**

Ease of students during guided by the lecturer assistant is in taking the time for field test, the ease in terms of time to provide guidance for action in the field, the ease in planning field practice, convenience in terms of time to provide guidance for action in the field, the ease in planning practice in the field, and ease of troubleshooting during on the field. Problems often arise in the field is related to the factor of communication between the student practitioner with the patient. In addition, communication between the owner of the clinic with the student, another difficulty is unqualified students in understanding the actions and maneuvers were performed in providing midwifery care to patients. As expressed below:

*“I think it is easier in almost everything, because you know, they (lecturer assistants) have time for tutoring, field exam; especially comprehensive exam will be more easier either, and the ease of troubleshooting during on the field.”*

## **4. DISCUSSION**

### **4.1 Tutoring process taken by lecturer assistant**

Lecturers are professional educators and scientists with the main task of transforming, developing, and disseminating science, technology, and the arts through education, research, and community service.<sup>3</sup> The definition of lecturer assistants is a person who helps a person perform his professional duties, so that the sense of teaching assistant is a person who helps a lecturer in performing professional lecturer duties.<sup>6</sup>

In a study of the practice of midwifery clinic, lecturers should provide a strong rationalization to students in the learning process, helping them determine what they need to learn, helping them set up and make what should be learned by students, ensuring that students participate and get involved, make the teaching and learning environment to be exciting and fun, giving plenty of opportunity to practice the students and tell the students about the progress they have achieved.<sup>7</sup>

Based on the results of the study, most of students said that the lecturer assistant gave evaluation/feed back against actions made by a student against the patient. The feedback will give you the ability to monitor students on himself with success, have higher aspirations for further achievement, greater personal satisfaction, and higher performance overall, so that feedback be improved naturally.<sup>8</sup> Feedback should give the

students an explanation of what they are doing right and what wrong they did as well as just in time, because the feedback is given with much-needed immediately in order to give the most effective benefits.

#### 4.2 Importance of lecturer assistant

The number of tasks that burden the responsibility of lecturer cause the focus in doing any work, especially in the field of education and the teaching practice of obstetric clinics in field. The current practice of indicating conditions students need the opportunity to earn the assessment and feedback when they integrate and implement the knowledge, skills, and new behavior. So as to achieve the goals of learning and applying new skills, required a conducive environment practices. One way to help improve conditions and the lecturer, lecturer assistant is required to help the professional duties of a lecturer in clinical obstetrics practice learning delivers on the field.

Based on the results of the interview, discussion in the process of clinic learning is very important because students can find out shortcomings and advantages as well as adding knowledge about various actions or case that founded by students during practice. Approach to guidance clinics approach can help students adapt to integrate theories in health services, developing competency clinics, build confidence and develop the professionalism by means of exchange of knowledge and skills with tutors<sup>9</sup>

#### 4.3 The Convenience Of The Students Guided by Lecturer Assistant

Results of the study mentioned that the student more comfortable guided by lecturer assistant because there is no sense clumsy as if done with the guidance of faculty mentors. Students feel more freely recounts his/her experiences, because age lecturer assistant are not much different from the student.

Yogyakarta Midwifery Academy has the innovation to help lecturers by recruiting alumni to become an Assistant Professor. Assisting lecturer Program is an alternative solution to improve the skills of students by engaging students and alumni as a peer educator/peer educators.<sup>10</sup> Expected with peer educator can provide a more effective approach on students.<sup>11</sup> The advantage of learning with peers is more open communication, so a sensitive issue can be discussed openly and searchable troubleshooting.

#### 4.4 Ease for Students in doing the guidance in the field

Communication is a message delivered to recipient of the communicators (source) through certain channels either directly/indirectly with the intent to give effect to the recipient according to what communicator wants. Thus, communication is the process of delivering the message or information from a person to another person.

Communication is very important because it is the primary method of communication in the process of implementing the education or action. Midwives need to understand and apply the concepts and process of communication to enhance the relationship of mutual trust with clients that will help change the behavior of the client in a positive direction. Communication with a midwife can deliver and receive messages so that the purpose of the midwifery can be succeeded.<sup>11</sup>

Based on the results of the interviews, the students found that it is difficult to communicate, either by the patient or by field supervisor. This can be caused by barriers of culture and language,<sup>12</sup> that one of the obstacles in conducting communications is due to cultural background.

The practice of midwifery obstetrics clinics by Yogyakarta Midwifery Academy held in the Special Region of Yogyakarta and Central Java, Yogyakarta Midwifery Academy students and come from various regions in Indonesia. At the time of the clinic practice in the field, students who come from outside of Java is often difficulty in terms of communication because of language used in contrast to communities in Java. The presence of lecturer assistant ease students in communicating with the client or with the pembimbing in the field and provide guidance in carrying out actions that have not been mastered by midwifery students, thus helping students achieve competencies should be owned by a midwife in providing midwifery services in order to be able to provide high-quality service.

### 5. CONCLUSION

Lecturer assistant at clinics need to be maintained to increase its quality. Practical learning in the classroom needed to use lecturer assistant as learning practice in the field so that students learning more convenient and easier to understand practical-learning material.

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## Class Management and Teacher Analysis: *An Action Research Lesson Study*

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**Abstract:** Action Research is “of the teachers, by the teachers, for the teachers,” where teachers need to analyse their own personalities and practice tendencies from specific concepts and a situation theory. It is important for self-analysis action research to examine teacher’s specific qualities, because each teacher has their own educational style and effective skills or techniques.

**Keywords:** Action research, Self-analysis, One’s own specific, Practice tendencies, Intermediate theory

This is a very typical example of action research which focused on self-analysis. The bottom line of action research is that even though you have the same theory and same teaching plan among teachers at your school, the effectiveness of each classroom must be slightly different. This is because each teacher has his/her own specific personality and professional skills.

In this study, I needed to analyze one’s own specific teaching character. The methodology of the action research contained two data analyzing strategies. One involved text mining through software called Word-Miner, the other was the KJ method which was an inter-subjective analog strategy.

Firstly, I was an 8<sup>th</sup> grade homeroom and mathematics teacher, surveyed my impression on the students and parents without their identification in order to analyze their true answers.

The questions were;

- 1) What do you think of me as a teacher? (both students and parents)
- 2) How do I associate with each individual student? (both students and parents)
- 3) What do you think of me as a person? (only students response, not parents)

I collected 133 respondent’s answers, which consisted of 31 first level students (as a classroom teacher), 43 second level students (as a mathematics teacher), and 38 third level students (as a mathematics teacher of 9<sup>th</sup> grade). I also gained responses from 22 parents (only from the 8<sup>th</sup> grade classroom).

The factors sampled from the teacher’s specific characteristics were “fairness,” “flexible sociological

distance between myself and the students,” “eagerness,” “great observant sense,” and “aspiration.”

It is important for self-analysis action research to examine the practitioner’s specific factors because each practitioner has their own educational style which is effective for their students, even though many teachers may have used the same educational theories, teaching materials and strategies.

Therefore, the important characteristic of the model (Figure F-7) below is that it included my own specific factors and genuine classroom management theories. Furthermore, it is necessary in order to develop the personal intermediate theory of classroom management as one of the action research strategies.

The small steps of intermediate theory play an important role in helping students recognize the connection between themselves and the whole class in order to improve classroom settings. In other words, these small steps emphasize the integration between students’ interests and the whole classroom needs.

As shown in the explanation of my classroom management style, it is the teaching and learning method that integrates students’ interests with classroom needs to increase both students’ personal/social skill development under classroom culture. Each micro step in Step 1 (cooperation) and Step 2 (independence) are essential to make students aware of their roles and their ability to cultivate their classroom climate. When students understand the connection between themselves and classroom problems, they become active partners and are

highly motivated to accomplish their classroom tasks. These small steps are part of the process of developing individual tasks from the main theme of classroom project. This process helps students identify their vital connection with each other.

Through the use of this process of classroom management, common classroom problems become relevant as a personal problem to each student. Therefore, it is possible to say that the micro steps included in Step 1 (cooperation) and Step 2 (independence) are valuable in helping students identify their personal classroom problems, to positively engage them in classroom volunteer work, and to promote the development of students' self-esteem. Step 3 (autonomy) engages students in performing classroom volunteer/positive work, which is the foundation of building democratic responsibility in the classroom. Students' correct understanding of problems facing the classroom and their appropriate reactions to improve their classroom are ways for them to become responsible students. Step 4 (reflection) is the best method to make students realise their efforts and improve their self-esteem.

The intermediate theory with the self-analysis method above was developed from action research which has proven to be beneficial in promoting self-esteem and building democratic responsibility in junior high school society. This action research successfully integrated students' interests with the issues of their own classroom. In this action research, one's specific factors were core elements combined with other analyzed elements. The issues of classroom management were genuine and meaningful. I had a strong "connection" to my students. Through their involvement in volunteer or positive work, the students had the opportunity to meet their individual needs. Their volunteer or positive work was not only meaningful to the classroom management but also relevant to themselves. The issues of classroom management gradually became personal tasks to students when they recognized their roles in the process of improving the classroom.

In this study, when students are engaged in classroom volunteer work students have the opportunity to meet needs that are not being met in an average school environment. Clearly, this contentious idea matched with the case study of action research.

Based on these findings through the analysis of the teacher's specific teaching characteristics, I found that action research succeeded in promoting self-esteem and building democratic responsibility in all students in all cases. Action research involved the students in meaningful classroom volunteer or positive work to help them become valued members of their school and classroom. Students developed a sense of classroom membership and exhibited high

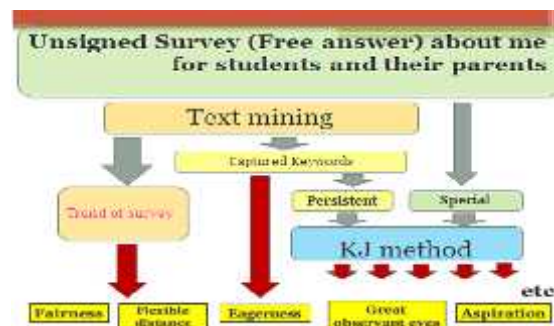
self-esteem through participation in meaningful volunteer or positive work to improve their small classroom society.

Based on the model theory shown above and the practice of action research, I developed an intermediate theory of the classroom that offers potential benefits in promoting self-esteem and building democratic responsibility in junior high school students. The strong connection between students' interest and classroom needs was the key point to create a successful classroom. The value of the intermediate theory combined with self-analysis lead to the development of individual tasks for students.

Conversely, there are some limitations in this research. It is essential to keep in mind that the intermediate theory was developed solely on the case study of action research.

However, to conduct action research procedure, it is imperative to understand the process itself. The reason why academic research and educational practice do not combine well is due to the cognitive distance between them. Therefore, the most important strategy for improving action research is to build an intermediate theory to connect academic theory and educational practice.

This is especially important in action research which is "of the teachers, by the teachers, for the teachers," where teachers need to analyze their own personalities and practice tendencies from specific concepts and a situation theory. In conclusion, it is important for self-analysis action research to examine practitioner's specific qualities, because each practitioner has their own educational style and effective skills or techniques.



## Teacher-Student Collaboration in Solubility Product Constant and Colloid Concept in Chemistry Learning of Senior High School

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**Abstract:**

The tendency of low interaction between teacher and student became the background of this study. The aim of this study is to analyze teacher-student collaboration in solubility product constant and colloid concept of chemistry learning. The subject of this research were one chemistry teacher and 27 students of XI IPA 2 SMA Laboratorium UPI. The type of this research was descriptive qualitative. The instrument that used in this research were observation sheet, video recorder. Ten times lessons were recorded by handy-cam and observed using observation sheet, and then made lesson transcript based on video lesson. Teacher and student's responses and questions analyzed using Hendayana lesson analysis framework to see the collaboration between teacher and student to improve pedagogical competence of teacher. The result of this research showed that the tendency of teacher response in solubility product constant lesson were INT (teacher interruption in group asking result and progress), MMR (teacher asking student to do something/procedure) and LJW (teacher answer student question directly). The tendency of teacher response in colloid lesson were MMR (teacher asking student to do something/procedure), LJW (teacher answer student question directly), and RPI (teacher answer by scientific question). Lesson analysis can be used to improve pedagogical competence of teacher especially to answer and response student's question and answer. It is importance for teacher to increase scientific question and reduce interruption to increase teacher-student collaboration.

**Keywords:** teacher-student collaboration, solubility product constant, colloid, chemistry learning

## 1 INTRODUCTION

In education there is interaction between learners and educators, the interaction of learners and educational resources that can take place in a situation of education, teaching, training, and guidance (Sukmadinata, 2006: 24). The importance of interaction between learners with educators will affect the learning process that can improve the quality of learning. To improve the interaction among students and student-teachers honed through experience and the establishment of collaborative learning community, that can be the vision and philosophy of the school reform. Learning community guarantees the right of every child's learning without exception, improving the quality of learning and the simultaneous achievement of quality and equity of learning but not only students but also teachers in the classroom (Sato, 2012: 19). Teachers collaboration to plot or no plot other subjects in order to improve the quality of learning to form a learning community. In the activities of learning community, according to Sato (2012: 19) there are three systems of collaborative learning in the classroom which are professional learning community and collegiality in the staffroom and participation of parents and communities. Building the learning community is to build a culture that facilitates its members to learn from each other,

mutual correction, mutual respect, mutual trust, mutual restraint ego. Building a culture of no moment, take a long time.

According to Vygotsky (1978: 32) the process of learning can occur in two phases: the first phase occurs when collaborating with others, and the second stage is done on an individual basis in which a process of internalization. During the process of interaction among teacher-students and among students, the following capabilities should be developed: mutual respect, test the truth of the statement the other hand, negotiate, and each adopted the idea that developing. The first stages of learning Vygotsky was started by a student who could not solve the problem alone, and then he had to ask the other students (Masaaki, 2012: 29). Teachers should be able to enable students to each member actually has a role in the group.

Each group should be given the opportunity to think for themselves, to work alone without any intervention from the teacher, if students are having difficulties, there will be collaboration between them. Thus, there will be a good and close relationship so that each student will be free to think and absorb the material without too much under pressure. The system can encourage students to collaborate for mutual learning (mutual learning)

in the classroom learning community in the learning community (Hendayana, *et. al.* 2013: 12).

Learning occurs when children work or learn to handle tasks that have not been studied, but the tasks are still within range of ability or the task is in the Zone of Proximal Development (ZPD / region proximal development) (Vygotsky, 1978: 34). The zone of proximal development is defined as the distance between the actual development and potential development. Vygotsky believes that higher mental function in general appears in the conversation on cooperation between individuals, before the higher mental functions were absorbed into the individual. How long it takes to build a culture of learning community has no limits (Hendayana, *et. al.* 2013: 11). In a learning community, communal reflection takes place so that the teacher can see for themselves how the learning is done during the learning process.

Lesson analysis developed by several experts including lessons according Fernandez analysis where the analysis focuses on teacher learning and student responses in learning. Previous lesson development analysis focussed on students in the learning phase. Matsubara's lesson analysis by focusing on the student's response and analysis by Hendayana and Hidayat lesson focuses on the interaction of teachers and students' responses (Hidayat, 2013: 7). In this study, researchers used variant of lesson analysis developed by Hendayana and Hidayat, this because in accordance to the characteristics of the class in Asia for self-reflection in order to identify the teacher-centered to student-centered.

In the subject matter that must be studied colloidal students, especially students of class XI second half, has the characteristics of a concept based on the concrete meaning can be expressed in real life, especially the application of the concept of colloid in everyday life, but also has the characteristics of colloidal material abstract with concrete examples. Students should be easier to understand this matter, but in fact the students have difficulty in understanding the colloidal material associated with many concepts and examples, as well as not being able to build relationships between existing concepts (Mutiasari, 2011: 3). Same with that said Oktariani (2011: 2) that, in the students' learning colloidal material has been unable to reconstruct the concept and the learning process is still dependent on the student's ability to memorize briefing information is then followed by doing exercises without being followed by the ability to understand the information that is memorized and connect with everyday life. This makes students' understanding of the material be comprehensive. Many students struggle to study chemistry, but often to no avail. This is because many of them do not build a proper understanding of the basic concepts of chemistry based on the

educational experience of students (Nakhleh, 1992: 192). The learning process chemicals also tend to emphasize aspects of any product without any aspect of the process. The nature of chemistry not only covers aspects of the product just like hooking facts, concepts and principles of chemistry. Chemistry is essentially also a process that involves scientific process skills and attitudes that are useful to acquire and develop knowledge of chemistry. In chemistry learning process, students and teachers involve in a series of activities in the order: observing phenomena and learn the facts, understand the models and theories, develop reasoning skills, and test chemical epistemology (Ahmad and Baradja, 2012: 6). One success key of the learning process variable is a qualified teacher. Teacher as educator is the figure who most associate and interact with the students compared to other personnel in the school. The teacher is responsible for planning and implementing the learning process, assessing learning outcomes, conduct guidance and training, conduct research and studies, and open communication with the public. Background of the above problems to tackle the problem, then it is time for teachers to try to make learning more fun in class two-way communication between students and teachers. So that students liked the chemistry lesson without being burdened with the collaboration of teachers and students in the material solubility product and colloidal systems in chemistry learning.

## 2 RESEARCH METHOD

Research method that is being used in this research is descriptive qualitative research methods. This research is focused on study about student-teacher collaboration on the solubility product constant and colloid concept in chemistry lesson. The research was conducted in there steps: 1). Analyzing instructional videos about solubility product constant and colloid concept in ten times of learning; 2) Analyzing the learning transcript's videos based on implementation in learning for student's responses analysis and anticipating teachers to the student's responses; and 3) Analyzing learning process based on the Hendayana's model framework to analyze the characteristics of collaboration among students and students-teachers. Subject on this research is students SMA Laboratorium Percontohan UPI class of XIIPA2, year 2013/2014 as initial respondents. There are a chemistry teacher and five researchers who becoming the observer. The instrument that used in this research consist of three kinds instruments: (1) Observation sheets, (2) Handycam, (3) Lesson analysis sheets. This observation sheets is done to obtain direct interaction between teacher and student, interaction and participation students during learning process. In addition, it is to

obtaining the data and the facts about the difficulties of respondents in concept of chemistry related to solubility and colloidal system of subject matters. Patterns of interaction and participation present on the format of observations. This format is referenced from research conducted by Dukmak (2009:271).

According to Hendayana (2013:9), lesson analysis is a method that is used to analyze the characteristic of learning process in the class in Indonesia, characteristic of interaction in the classroom with a student-centered learning and more to teacher self-reflection. In addition, according Matsubara (2012:40), lesson analysis is a method for analyze the learning process by using transcript that focus on students responses and learning situation.

Verbal data will be transcribed into written data. All the entire lesson videos that was recorded during implementation of learning process transcribed and refined to obtain the basic text from learning process that was observed. That basic text later used in coding step to obtain data of learning activities, interaction among students, interaction between students and teachers that would be appears during implementation study of solubility product constant and colloid subject.

### 3 RESULT AND DISCUSSION

The result of this research shows learning process that has done in solubility product constant and colloid subject matters based on Hendayana lesson analysis framework focus on analyzing the collaboration between students and teachers on the group session. The first lesson shows that the interaction and collaboration of teacher-student not good enough, it can be seen from the results of analysis lesson. Interaction is mostly done when the teacher-student grouping session is, the categorization LJW have not seen teachers interact with students. It can be seen from the following photo.



Figure 1. Teachers answer student's question directly.

In the second study was increasing and the difference pattern teacher-student collaboration is evident MPR from the frequency 81 categorization, categorization RPI occur with 61 frequency that is

pretty good compared to the collaboration of The first lesson but still not significant.

In the third study in group interaction and collaboration sessions conducted teacher-student looks more to the MPR categorization of the frequency 58. This shows that based on the results of this analysis lessons seen an increase in the pattern of teacher-student collaboration on categorization RPI where teachers more 31.

In the fourth lesson, the common ion effect and the effect of ph on solubility concept did not shift the pattern of interaction and collaboration are very significant, but the reduction of the pattern in which the teacher so teachers can do self-reflection on the categorization LJW of the four learning collaborative learning has yet trend still teacher-centered learning.



Figure 2. Teacher answers students question through scientific question.

In the fifth and sixth learning increased teacher-student interaction patterns are caused by the MPR characteristics of the material colloidal system is enough to give a fairly good collaboration patterns and students are doing and find experiment result without always guided teachers that learning tendencies already towards student-centered.

On learning the seven visible increase teacher-student interaction patterns on TPS categorization with frequency LJW categorization and the increased MPR and RPI, but generally occur fairly good collaboration between teachers and students in learning so that learning more focused on the students (student-centered). This is evident from the way students interact in a group when the presence of the teacher involved.



Figure 3. Teacher does interruption for students observation result.

In the eighth study showed an increase and shift pattern of significant collaboration on the categorization of the Assembly with the RPI, but the frequency of INT and MJL category sodium

absorption ratio change significantly and includes patterns of interaction and collaboration are rarely performed teachers.

In learning to nine looks learning has been highly increased more significantly in the presence of a more effective learning between teachers and students where the teacher is to answer the questions asked by the students to return scientific questions for this is the level of teacher-student collaboration categorization is quite high.



Figure 4. teachers instruct students to do something procedures

On the tenth learning occurs collaboration and interaction is excellent between teacher-student learning so that trend more towards student-centered with the categorization of MMR and the RPI is still increasing and categorization LJW and INT were increased also in the last lesson of 10 times the learning undertaken by of the transcript of the video, the lesson by lesson analysis Hidayat & Hendayana occur fairly good collaboration between teacher-student.

#### 4 CONCLUSIONS

Lesson analysis could be used to increase the competence of teacher's pedagogy, especially to answer student's question and making anticipation for student's responses. This is important to teachers to develop any scientific questions and limit the interferences thus, collaboration between teachers and students in the chemistry lesson could be increased especially, and for the RPI category those are teachers answer the scientific question and present presence of good communication patterns between teachers and students.

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## Realizing Learner-Centered Lesson through Lesson Study: *Zambian Experience in African Context*

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**Abstract:** Zambian government has put a strong focus on the Continuing Professional Development (CPD) of in-service teachers. Under this policy, the Ministry of Education, Science, Vocational Training and Early Education introduced lesson study practice of teachers into primary and secondary schools in the country. This paper shows an outline of workshop presentation on how government of Zambia introduced and modified lesson study practice of teachers in primary and secondary schools in order to promote learner-centered lesson in science and mathematics. The first part describes methods of implementation of lesson study in Zambia together with its effects and challenges. Though the practice contributed the improvement of teachers' skills and students' performance, there could still be quality issues to be improved in conducting lessons and lesson study activities. The second part shows how Zambian teachers understand learner-centered lesson with sample results of questionnaire. It was found that teachers understanding on learner-centered lesson are still superficial; therefore, it is necessary for them to continuously try conducting problem solving or inquiry lessons based on Kyozaï-Kenkyu (intensive study of teaching and learning materials) practice in the lesson study at schools.

**Keywords:** Continuing professional development, Learner-centered lesson, African context

### 1. INTRODUCTION

The Ministry of Education, Science, Vocational Training and Early Education (MESVTEE) in Zambia has put a strong focus, in its policy, on the Continuing Professional Development (CPD) of in-service teachers at primary and secondary schools to improve the quality of teaching and learning at classroom (GRZ, 2011). As the policy recommends implementation of demand-based, continuing small-sized teacher training (MoE, 1996), the Ministry has been conducting School-based CPD (SBCPD) programme since 2005. This programme enables all the teachers at primary and secondary schools in the country to have opportunity to continuously learn from each other at school level. In SBCPD, the institutionalized framework called “School Programme of the In-service for the Term (SPRINT)” provides a platform for teachers to continuously have meetings and trainings at school and zone level. Using this framework, the government introduced lesson study practice of

teachers in Central province in 2005 with technical cooperation of Japan International Cooperation Agency (JICA). In 2007, the practice was extended to Copperbelt and Northwestern provinces, and in 2013 it was introduced in all the provinces in the country. As of June 2014, 2,682 schools out of 8,500 are conducting lesson study with a participation of 41,243 teachers in total out of 85,000 (MESVTEE, 2014). The aim for introducing lesson study is to improve the quality of lessons at primary and secondary schools, especially in science and mathematics subjects, with a focus of enhancing learner-centered lesson at classroom.

### 2. OBJECTIVE

Based on the lesson study practice and experience in Zambia, this workshop is organized with objectives below.

- 1) To introduce how primary and secondary school teachers in Zambia are conducting lesson study at school level with its effects and issues

2) To share experiences and challenges of Zambia in promoting learner-centered lesson through lesson study

The workshop consists of three parts. The first part is an introduction of lesson study conducted in Zambia. The second part is a presentation on how learner-centered lesson has been promoted in Zambia through lesson study. The third is an open discussion and exchange of ideas. Visual and descriptive aids are used in the presentation.

### 3. LESSON STUDY IN ZAMBIA

#### 3.1 Features of Zambian Lesson study

Among many African countries, the Zambian government has institutionalized a programme to request all the teachers at primary and secondary school level to conduct lesson study at their schools as CPD activity. Lesson study in Zambia is basically conducted by schools following the Implementation Guidelines prepared by the MESVTEE under the SBCPD programme. The basic features of Zambian lesson study are described in Table 1. When lesson study is conducted, teachers basically follow eight (8) steps of activities shown in Figure 1 (MoE, 2010a). The flow of activities is called lesson study cycle.

Table 1. Basic Feature of Zambian Lesson Study

Factor	Feature
Target level	Both at primary (1-7) and secondary (8-12) levels
Target subject	Science and Mathematics as entry, extended to all subjects
Participants	Teachers at school (by subject group or grade group)
Unit for Implementation	By school or by cluster
Frequency	Once a month (7 cycles per year) by each group
Lesson Study Cycle	8 steps of activities
Planning of lesson	Lesson plan prepared by a group of teachers
Demonstration teacher	Selected by each group
Lesson Observers	Fellow teachers, Head teacher, Deputy head teacher
Resource person	Trained Lesson Study Facilitators

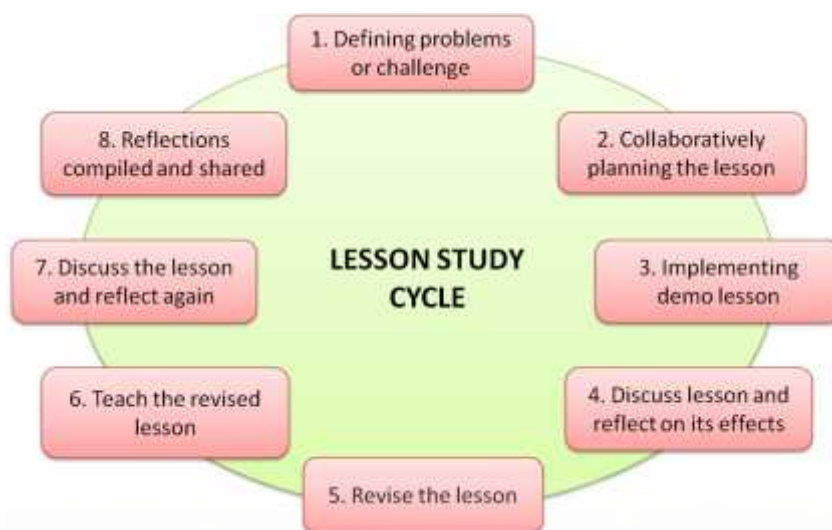


Figure 1: Lesson Study Cycle



In the eight (8) years of implementation, Japanese practice of lesson study has been modified to fit the Zambian system and situation. For example, Zambian lesson study cycle has two demonstration lessons and post-demonstration discussions. This is to ensure that the improvement of a lesson takes place in the second lesson. Another unique feature is that planning of the lesson is usually done by a group of teachers instead of individual teacher, so that each teacher can feel ownership on the lesson and does not need to criticize a particular person. In the same manner, teachers are careful of making comments on the lesson in the discussion to have better critiques for improvement instead of criticizing a demonstration teacher. In addition, in parallel to lesson study activities in schools during school terms, stakeholders such as head teachers, deputy head teachers, education officers and resource center coordinators gather at workshops to be held at provincial, district or zone level in every school holiday to make implementation reports of

lesson study and to share outputs or difficulties. Further, experienced or eager teachers are appointed as “lesson study facilitators” who are given special training and requested to make technical inputs to lesson study activities in schools. These modifications were created in trial and error according to the situations and cultures in Zambia.

### 3.2 Effects of Lesson Study

To assess the effects of lesson study, the Ministry conducts surveys before (baseline) and after several years of lesson study implementation (endline). The survey consists of observation of lessons and administration of questionnaire to students on the impression of the lesson. Below are the sample results between 2008 and 2010 in Northwestern province which show the changes of teachers’ skills and impression of students, though the changes of students were still minimal (MoE & JICA, 2010).

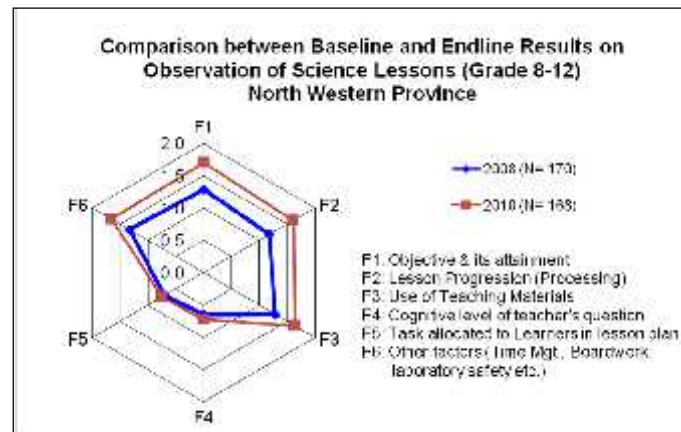


Figure 2: Comparison of science lessons observed in 2008 and 2010 in Northwestern province

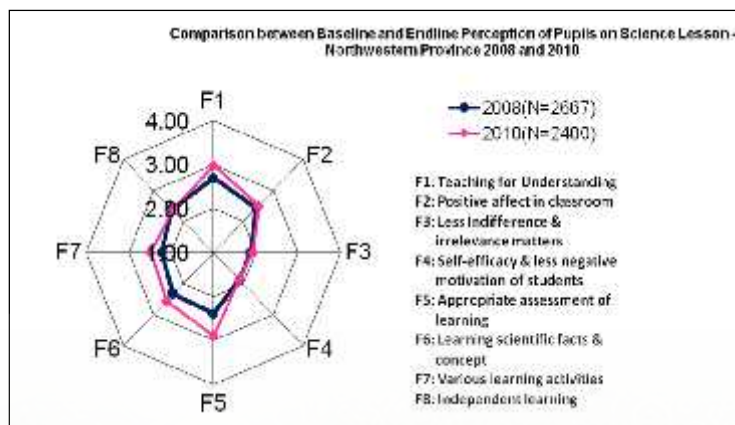


Figure 3: Comparison of students’ impressions on science lesson in 2008 and 2010 in Northwestern province

After five (5) years from when the Central province started lesson study, an impact survey was conducted in 2010 to assess the effect of lesson study on the students’ performance. The graphs below show the changes of Grade 12 students’ pass rate at national examination in science (physics & chemistry) and biology. Comparing with students in the provinces which had not started lesson study, it was found that examination pass rates increased after lesson study was introduced (MoE, 2010b).

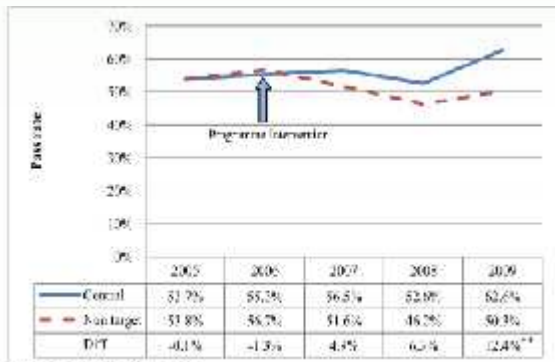


Figure 4: Examination Pass rate for Science

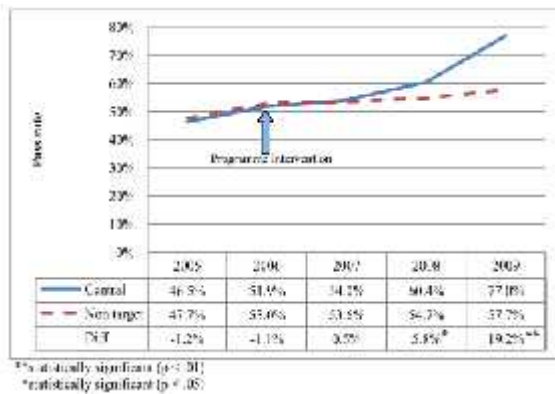


Figure 5: Examination Pass rate for Biology

### 3.3 Issues on the implementation of lesson study

The impact survey in 2010 revealed that teachers’ heavy workloads, having extra classes and high pupil-teacher ratio were hindering factors in implementing lesson study, while existence of trained facilitator and availability of teaching materials were found as enhancing factors. In the monitoring at some schools, the following issues were found as main challenges for the implementers

to overcome.

#### [Management issues]

- Some teachers and headteachers still show negative attitudes to have CPD activities and lesson study. Lesson study could be a kind of routine work of teachers without having effectiveness.
- In some schools, understaffing of teachers and their heavy workloads make it difficult for them to find time to have lesson study.
- In rural schools, teachers have difficulties to get reference books and information for the improvement of the lesson.
- Some schools cannot get support of a facilitator or resource persons. As a result, extent in the improvement of a lesson is limited.
- Schools are scattered in vast area of the country. Geographical location of schools makes it difficult for education officers to monitor and assist teachers periodically.

#### [Contents issues]

- Quality of lesson delivery is still an issue. Teachers generally appreciate the methods which are considered to enhance learner-centered lesson such as problem solving and inquiry methods; however, it is still difficult for them to apply those methods in their lessons. They easily go back to teaching in their traditional way of teacher-centered teaching.
- In lesson study, most of the teachers still focus on how they teach and not on how students learn.
- Teachers do not always have ideas for improvement of lessons in lesson study. It is difficult for the school especially in rural areas to have technical inputs from resource persons.

## 4. LEARNER-CENTERED LESSON AND LESSON STUDY

In Zambia, one of the crucial aims for conducting lesson study is to promote learner-centered lessons in the classroom. Among the implementers in the MESVTEE, it is considered that, firstly, teachers need to understand the fundamental principles and practices of learner-centered education, although the

ultimate aim is to ensure that learners are developed holistically in the lessons. Learner-centered education is defined in Zambia with some key features like, 1) The learner’s thought process takes the center stage, 2) The teacher provides support as well as challenges to the learner, 3) Learners express their own thoughts, and 4) Learners have dialogue and debates. To promote these ideas to the teachers, implementers of the programme found that various approaches, such as problem solving, inquiry & discovery, ASEI-PDSI (Activity, Student-centered, Experiment, Improvisation – Plan, Do, See, Improve) as well as the concept of subjective learning (active learning) and Kyozaï-Kenkyu practice (intensive study of teaching and learning

materials), could be disseminated to improve the lessons in schools through lesson study. Therefore, the sessions on these knowledge and skills are conducted for facilitators and teachers in many opportunities of workshops and meetings to enhance the introduction of these approaches and practices.

In the process of introducing and deepening lesson study practice in schools, implementers of the programme periodically conduct a small assessment to the teachers on the understanding of learner-centered lesson using a questionnaire prepared by the programme implementers (Annex). The questionnaire includes 20 questions on the general features of learner-centered lesson.

No	Explanation	Agree (%)	Disagree (%)
1	It is generally easier for teacher to organize learner-centered lesson comparing to organizing teacher-centered lesson.	49	51
2	To conduct a good learner-centered lesson, it is recommended for a teacher to always prepare activity sheet for students.	80	20
3	In learner-centered lesson, students understand a problem with an assistance of teacher.	64	36
4	If a lesson has experiment or activity by students, it is a learner-centered lesson.	63	37
5	In learner-centered lesson, sometimes lesson topic is not told at the beginning of lesson.	78	22
6	In learner-centered lesson, teacher should put more attention to groups of students than individuals.	16	84
7	Learner-centered lesson focuses thinking process of students.	98	2
8	Achievement of lesson objectives is not very important in learner-centered lesson.	10	90
9	Interaction among students is one of the important factors in learner-centered lesson.	84	6
10	Whenever preparing activity sheet for a lesson, detailed prescriptions for students has to be written.	54	46
11	Teacher should manage a lesson so that students don’t have wrong idea in a development process of a lesson.	76	23
12	Wrong idea of students has to be corrected immediately by a teacher.	58	42
13	There is no perfect lesson even if a lesson is learner-centered.	68	32
14	Teacher has less work in conducting learner-centered lesson, because students can work by themselves.	69	31
15	Problem given to students is a key to conduct learner-centered lesson.	95	5
16	Teacher needs to plan a good introduction of a lesson to start learner-centered lesson.	96	4
17	If a teacher attends a special training on learner-centered lesson, he/she would be able to conduct learner-centered lesson immediately after the training.	58	42
18	There is no uniform definition of learner-centered lesson.	69	31
19	Learner-centered lesson put more focus on the development of varied abilities of students than memorizing knowledge.	98	2
20	Learner-centered lesson cannot be conducted without equipment.	17	83

Figure 6: Sample result of questionnaire on understanding of learner-centered lesson

Figure 6 is a sample result of the assessment conducted in July 2014 for randomly selected 100 teachers at secondary schools in the country who teach science or mathematics. For example, on question No. 1 (It is generally easier for teacher to organize learner-centered lesson comparing to organizing teacher-centered lesson.), 48% of teachers think that it is easier to organize a learner-centered lesson comparing to organizing a teacher-centered lesson. They might think that a learner-centered lesson is easy to be conducted because learners can study by themselves. On question No. 10 (Whenever preparing activity sheet for a lesson, detailed prescriptions for students has to be written.), 54% of them answered agreeable to the sentence which recommends teachers to always put detailed prescriptions on students' sheet, without having an idea that teachers sometimes do not need to give detailed instructions in order to foster students' thought and creations. On question No.12 (Wrong idea of students has to be corrected immediately by a teacher.), 57% of them agreed with this sentence, even though teacher can intentionally use students' wrong idea for deepening their discussion and understanding in the process of lesson. Further, on question No. 17 (If a teacher attends a special training on learner-centered lesson, he/she would be able to conduct learner-centered lesson immediately after the training.), more than 50% of teachers agreed with the sentence. This makes us consider that teachers think they can easily master how to conduct learner-centered lesson and realize it in the classroom. In summary, it is revealed, from some of these results, that teachers understanding on learner-centered lesson are still shallow and superficial, thus, quality issues described in prior chapter were observed in lessons and lesson study activities. It also tells us that changing teachers' idea and understanding on learner-centered lesson may take a more time, since they need to deepen their idea through the continuing study and practice as their CPD. Therefore, it is necessary for the implementers of the programme to continuously provide the teachers with ideas and hints based on approaches and practices mentioned above for improving their lesson study.

## 5. CONCLUSION

Since lesson study was introduced to the schools in Zambia, almost ten (10) years have passed. In the ten-year period, the practice has been quantitatively extended to more number of schools in the country; however, there could still be qualitative issues in terms of implementing learner-centered lessons which are the aim of lesson study practice. It is known that certain period of time is required to change the understandings of teachers on how to conduct lessons, because the implementers always do trial and error in selecting better methods of teaching or conducting lesson study. Based on the practice in Zambia on the conduct of lesson study and promotion of learner-centered lesson, information and experience are shared in this paper. Considering a long-term effect of lesson study, the daily efforts to improve lessons and lesson study activities are important for implementers as their CPD activities.

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Performance and Skills (STEPS) project, July  
2014, Lusaka, Zambia*

Annex:

**Questionnaire on Learner-centered lesson**

Province: \_\_\_\_\_ District: \_\_\_\_\_

Name: \_\_\_\_\_ School: \_\_\_\_\_

Sentences below explain general understandings of learner-centered lesson. Please write **A** if you **agree** with a given explanation, write **D** if you **disagree**.

#	Explanation	Agree or Disagree
1	It is generally easier for teacher to organize learner-centered lesson comparing to organizing teacher-centered lesson.	
2	To conduct a good learner-centered lesson, it is recommended for a teacher to always prepare activity sheet for students.	
3	In learner-centered lesson, students understand a problem with an assistance of teacher.	
4	If a lesson has experiment or activity by students, it is a learner-centered lesson.	
5	In learner-centered lesson, sometimes lesson topic is not told at the beginning of lesson.	
6	In learner-centered lesson, teacher should put more attention to groups of students than individuals.	
7	Learner-centered lesson focuses thinking process of students.	
8	Achievement of lesson objectives is not very important in learner-centered lesson.	
9	Interaction among students is one of the important factors in learner-centered lesson.	
10	Whenever preparing activity sheet for a lesson, detailed prescriptions for students has to be written.	
11	Teacher should manage a lesson so that students don't have wrong idea in a development process of a lesson.	
12	Wrong idea of students has to be corrected immediately by a teacher.	
13	There is no perfect lesson even if a lesson is learner-centered.	
14	Teacher has less work in conducting learner-centered lesson, because students can work by themselves.	
15	Problem given to students is a key to conduct learner-centered lesson.	
16	Teacher needs to plan a good introduction of a lesson to start learner-centered lesson.	
17	If a teacher attends a special training on learner-centered lesson, he/she would be able to conduct learner-centered lesson immediately after the training.	
18	There is no uniform definition of learner-centered lesson.	
19	Learner-centered lesson put more focus on the development of varied abilities of students than memorizing knowledge.	
20	Learner-centered lesson cannot be conducted without equipment.	

## Interpreting Knowledge Creation in Lesson Study

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**Abstract:** This presentation discusses the dynamic nature of knowledge creation of teaching and learning within Lesson Study context in Indonesian primary education. By drawing on the case of innovative partnership between a private primary school and Indonesia University of Education, I highlight how these collaborating organizations exploit pedagogical knowledge. In doing so, I use the notions of SECI model, Ba and Knowledge Assets (Nonaka and colleagues., 1998; 2000) to articulate the spiral action and interaction of participating teachers involved in mathematics Lesson Study workshops enriched by didactics perspective. Hence, I describe such a workshop in terms of Ba as providing shared time and space in transcending existing ontologic and organic boundaries. It then leads to depict the interacting nature of tacit-explicit knowledge conversion through SECI model moderated by specific knowledge assets called Didactical Design Research (DDR) and metapedadidactic (Suryadi, 2013). Finally, I discuss the challenge to interpret such educational partnership in the teacher education and development field from the knowledge creation stance.

**Keywords:** Knowledge creation, SECI model, Ba, Didactical Design Research, Lesson Study.

### 1 INTRODUCTION

In Indonesian context, the interrelationship between school improvement and professional development is best represented by Lesson Study (LS). It has been introduced since 2000s through technical cooperation between Japan International Cooperation Agency (JICA) and three Indonesian leading teacher education institutions, e.g. Universitas Pendidikan Indonesia (UPI). Its development has shown key important stages: 1) capitalising university-school partnership by applying collaborative action research; 2) establishing subject teacher group-based and school-based LS as to promote reflective practice among partnering teachers; 3) developing district-wide subject teacher groups and school-based LS in promoting learning community and school reform; and 4) dealing with challenges to bear on practice of improvement and sustainable leadership (Suratno, 2012).

The Indonesian Lesson Study movement resembles, to some extent, four phases of school improvement as described by Harris and Chrispeels (2006). As LS has been established through partnership, it might contribute to the establishment of the fifth phase of networked learning communities. Reaching such stage, though, is indeed

challenging. Suratno (2012) describes such key issues as: 1) dealing with contrived collaboration and collegiality; and 2) leading practice of improvement: system learning, capacity building and cultural change. Chrispeels and Harris have underlined of keeping balance between: 1) individual initiative and system change; 2) internal and external resources and ideas; 3) pressure for accountability and support for change; and 4) independence and collaboration. Therefore, I would argue that dealing with challenges need organising theme underpinning methodological approach for inquiring both professional learning and school improvement.

Our experience has suggested that it should be centered on improving teacher knowledge about the nature of teaching and learning. Therefore, this study is based on practical knowledge of Japanese Lesson Study (NASEM, 2011) and theoretical stance of European tradition of didactics (Kansanen, 2003; Brosseau, 2002). In addition, we also consider the notion of Deweyan extensive knowledge and adaptive expertise of teachers (Darling-Hammond & Bransford, 2005; Darling-Hammond, 2006) as well as practice-based professional education (Ball & Cohen, 1999) that might be developed expansively through activity systems (Engestrom, 2001).

## 2 BA, SECI MODEL AND KNOWLEDGE ASSETS

In their seminal works, Nonaka and colleagues (1998; 2000) underline the importance of *ba* in knowledge creation. The notion of *ba* can be defined as shared context for learning in which knowledge is embedded. As knowledge is intangibly placed in the individuals or groups physically, virtually and mentally, it will be best acquired through direct experience or reflection on the experience of others. To grasp the knowledge one should transcend one's own limited perspective and explore the boundary between rationality and intuition. Hence, as the foundation of knowledge and frame for knowledge activation, *ba* needs organic concentration: sharing knowledge should be focused at defined space and time.

Knowledge creation occurs when two kinds of knowledge, i.e. tacit and explicit knowledge, interact. Explicit knowledge can easily be expressed in various forms and transmitted between individuals as we read for example the text book or manual. On the contrary, tacit knowledge is invisible and inexpressible as it is rooted in one's action and experience. Tacit knowledge includes technical skills or know how and cognitive dimension such as belief system and mental model that shape how one perceives the world.

There are four patterns of knowledge conversion largely known as SECI model: 1) socialization in which individuals share tacit knowledge directly; 2) externalization that requires articulation and translation of tacit knowledge to which it is understandable by means of dialogue; 3) combination that systemizes explicit knowledge to be communicated and distributed in the sophisticated manners; and 4) internalization which is the conversion of explicit knowledge into organization's tacit knowledge, for instance through practical training.

Central to knowledge-creating process is knowledge asset as specific resource creating value that consists of inputs, outputs and moderating factors. There are four types of knowledge assets: 1) experiential mode in which tacit knowledge is shared through common experiences; 2) conceptual mode in which explicit knowledge is articulated through cultural signs; 3) systemic mode in which explicit knowledge is formalize and packaged; and 4) routine mode in which tacit knowledge is embedded in actions and practices.

## 3 TEACHER KNOWLEDGE, LESSON STUDY AND DIDACTICS

How these three element of knowledge-creating process be interpreted to explain the creation of knowledge base of teaching and learning through Lesson Study? As Jackson (2006) has noted that inquiry for educational change implies informed reorientation around interventions and associated knowledge management (Nonaka & Takeuchi, 1995). Reading research on teacher thinking and learning may shed light on knowledge development approaches: 1) knowledge for practice (i.e. subject matter, pedagogy, and theories of learning); 2) knowledge in practice (i.e. practices of curriculum, instructional and assessment); and 3) knowledge of practice (i.e. accumulated theoretical and practical knowledge) (Hammerness et al., 2005).

Capitalizing thinking may establish teaching culture and promote teachers' capacities as having both curriculum developer lens and students lens to dig out the vision of powerful lesson, motivation to put knowledge into purposeful practice, as well as personal and collegial qualities that support learning (Fernandez & Yoshida, 2004). In the context of lesson study, it may also lead to our understanding related to how we manage system thinking and create pedagogical knowledge.

Managing both teacher knowledge and thinking through lesson study is both important and yet difficult. Literature review has shown that the notions of expansive knowledge (theoretical vs. practical), adaptive expert (efficiency vs. innovation), practice-based professional education (analysis of disequilibrium), knowledge creation theory (tacit vs. explicit knowledge) and activity theory (analysis of contradiction) all discuss about discrepancies in terms of thinking (cognitive) process and content of knowledge. Hence, dialogue of different point of views and networks might provide spatiality and temporality for transfer and application in the workplace learning. Therefore, neo-Vygotskian views that knowledge and expertise are generated through vertical and horizontal dialogue. Hence, promoting thinking culture within professional learning community requires dialogic inquiry (Wells, 2004).

Through dialogic inquiry on interrelated perspectives, our research team has further developed the thinking tool called Didactical Design Research (DDR) introduced by Suryadi (2010; 2013). It represents the very nature of teacher thinking regarding: 1) how teachers develop relationship directly with students (pedagogical relation) and



relation mediated by teaching materials (didactical relation); and 2) how teachers design, implement and reflect on teaching-learning processes.

According to DDR framework, one of key issues to be studied is the relationship between teacher's and students' thinking from which teachers could develop their teaching sequences and strategies. Therefore, analysing teaching-learning should focus on key features of didactical design: 1) didactical situations; 2) learning obstacles; 3) learning trajectories; and 4) didactical assessment.

Brousseau (2002) conceptualises teaching sequence as interconnected situations. The notion of situation is dialectic in nature that mainly involves thinking interactions through information exchange, action and feedback. Relations among situations constitute a mental model that might be represented as strategy, representation and argumentation. Hence, didactical situations consist of three important features: action, formulation and validation situations. Action situation is when student develop implicit mental model as strategy for solving problem. Formulation situation is when students make communication and exchange of information particularly feedback from the milieu. In this stage, students make reasoning and argumentation as represented in their language as to indicate their formulation model that is accessible for one another. Finally, validation situation is when students share their mental model and formulation model to validate each other as to promote conceptual construction such as a theorem. This stage links action and formulation situations. By utilizing feedback, it may give rise to students' awareness, for instance, learning from mistake. Therefore, designing didactical situations should consider their interconnected sequences. Moreover, the overall situations that acted upon and handled by students constitute a milieu in the way that didactical situation approaches learning as thinking.

Brousseau also identifies learning obstacles as epistemological, ontogenic and didactical. In short, ontogenic obstacle relates to the gap between the level of student thinking and internal logic embedded in the didactical design presented by teacher. Didactical obstacle results by the way teacher design the lesson that hampers the learning trajectories of students. Epistemological obstacle represents limitation of student understanding that hinders him/her to expand understanding to wider context. Meanwhile, didactical assessment comprises of students' interest and affect, mathematical or scientific thinking, representational skills or inquiry skills, and conceptual

understanding. Finally, learning trajectories represent logical sequences of previous, current and future content to be taught. Therefore, teacher should consider the interrelated mental processes embedded in the teaching materials.

DDR framework provides teachers a critical reflective practice. First, reflection for action which is undertaken by a teacher before the lesson conducted. In doing so, teacher does prospective analysis by means of recontextualisation and repersonalisation the content to be taught as to make curriculum analysis. Second, reflection in action in which teacher analyses didactical situations as to base his/her pedagogical decisions. Third, reflection of action is conducted after the lesson finished. In this way, teacher might involve other colleagues to do retrospective analysis by means of comprehensive inquiry about what was designed and what was happen in classroom. In doing so, teachers can discuss the interrelation of didactical design, didactical situations, learning obstacle and learning trajectory, as well as didactical assessment.

Furthermore, Suryadi (2010; 2013) introduces the notion of metapedadidactics as framework for teacher argumentative reasoning. It is argued that basically teacher thinking processes happen before, during and after the lesson. The overall processes are complex in nature. According to metapedadidactics point of view, a good quality of teaching-learning should achieve the following criteria: 1) unity (of situations); 2) coherence (logical sequence of situations); and 3) flexibility (dealing with students' learning obstacles and trajectories). It is through such key ideas teacher can base his/her reasoning in dealing with the complexities of teaching and learning.

Basically, there is no perfect lesson but there are rooms to improving teaching and learning. DDR puts such premise in scrutinising teaching culture by means of teacher thinking. DDR analysis starts with any current didactical design through both recorded and/or lived observation. The analysis has many foci, it may focus on learning obstacles, learning trajectories, didactical situations or metapedadidactics. The results of analysis may produce alternative didactical design that can become current didactical design for further analysis.

To engage teachers experiencing DDR analysis, we stimulate their thinking process by means of what so called as Socratic Questioning. This tactic promotes teachers to do what so called as repersonalisation. For instance, we scrutinised what is mathematics, how we learn it and then how we

teach it. In doing so, we intentionally engage ourselves to interrogate and inquire our practice. Hence, our dialogue generated diverse point of view which in fact represents tacit knowledge. Through such reflective and argumentative dialog we analyse practice of improvement in terms of networked knowledge and expertise between primary school and teacher education institution. It provides the knowledge vision is to develop and promote sharing of knowledge assets, create and energise ba, and enable and promote the continuous spiral of knowledge creation.

#### 4 KNOWLEDGE CREATION IN LESSON STUDY

This study is part of collaborative inquiry between a group of UPI's faculty members and a private primary school that has been conducted since September 2012. Promoting thinking culture in professional learning and school improvement through lesson study is our central theme of inquiry.

Lewis et al. (2006) suggest that to improve instructional core requires intervening changes in terms of teachers' knowledge and beliefs, professional community and commitment, and teaching-learning resources. Hence, reflecting from LS experience, UPI's faculty members and the primary school leaders strategised series of workshop centering on developing teacher thinking as to create.

Firstly, the workshops, for example with group of math teachers, focused on three important questions regarding the concept to be taught: What is the volume of cube? How we learn it? Then how we teach it? Through dialogic inquiry, we tried to extend knowledge of math teachers about teaching and learning the volume of cube as to improve their meta-knowing of pre-lesson planning. Secondly, the activity system for DDR was developed as to recontextualise the plan-do-see cycle of LS. Compared to ordinary LS which tended to focus on classroom observation and immediate post-class discussion (Hendayana et al., 2007), our approach is to focus on preparation phase and employ delayed post-class reflection. The reason is to provide more space and time for us to think deeply about mathematical teaching-learning. Therefore, we engage them with the repersonalisation, i.e. teachers were asked to experiencing the way they think and learn what they are going to teach.

One of key vignettes is the math lesson of the volume of cube and rectangular. The objective of the

lesson was that children are be able to formulate the volume of cube and rectangular by their own with help of manipulative.

Teacher started the lesson by presenting the following situation: "I have many books. If I would like to put those books into book shelf and this small container, which one can contain more books?" As it was predicted, children could easily imagine the difference. It aimed to introduce concept of volume in terms of 'contain'. Teacher then showed a volley ball and a tomato and asked: "Which one is having more" and students could imagine the difference as well. Finally teacher asked students to prove two different sizes of rectangular in which students filled in it with set of cube units. At the end of this apperception stage, students could prove which one is having more. They seemed to be interested by discussing their prediction. At this point, teacher intended to show relation among shapes, sizes and contain.

When entering to core instructional activity, teacher then asked students to count and compare three rectangular with different sizes by using pictorial model. It was then followed by asking students to determine how many cube units within a cube of  $5 \times 5 \times 5$  and how many cube units of several rectangular with different sizes. Finally, teacher asked students to formulate the volume of cube and rectangular. At this stage, we observed that children could do all tasks, including counting, comparing and determining how many cube units within a rectangular. They seemed enjoying these sessions and actively used manipulatives. These stages aimed at pointing out children to the idea of volume. However, we were curious of what happened in the end of the lesson. When teacher asked children to make abstraction of volume, most students were confused how to formulate it.

During post-class discussion, mostly participating teachers viewed that the lesson run well and equipped with rich teaching materials. Children were considered as having joyful and active learning. However, model teacher sensed that children had difficulty and lost focus when asked to formulate the volume of rectangular. We analysed that students were dealing with didactical obstacles as represented by the ways teacher develop teaching sequence. Since it was started, the lesson tended to engage students with comparative thinking between two or more different sizes of cube or rectangular. At beginning, it was appropriate to present the idea of contain. However, next steps kept comparison as ways of thinking. Children felt confuse because they spent time to perform tasks of comparing. Therefore,

children had image that the aim of the lesson is comparing volume, not formulating volume. It was the reason why children lost focus. In addition, we identified that the lesson only applied action situation which clearly explained why students were in difficulty to make mathematical formulation. We then shared our finding as well as our hypothetical didactical situations of the lesson.

Such vignette provided space for conceptual difference, a kind of disequilibrium in our dialogic inquiry. It stimulated us to think more in terms of how we design and analyse the lesson. Immediately we found the ideas such as “acting like students”, “predicting and anticipating learning obstacles and learning breakthrough”, “hop-jump-step” to incorporating action-formulation-validation situations”. Such pedagogic discourse with specific articulation represents both epistemological and ontological dimensions of knowledge creation in specific context of primary school improvement. In what follows, we are discussing such practical notions.

**4.1.1 Acting like students**

We exercised the notion of acting like students by asking teachers to clarify what is the very nature of volume of rectangular or cube. We then asked teachers to use manipulatives and make comparison of the volumes and questioned them “Does it help you to make formulation?” Then we went back to the question of what is the volume of cube of rectangular. We finally discussed that the formula is a multiplication of three variables of  $p \times l \times t$ .

By doing such acting like students we intended to give rise teachers’ awareness about what would happen from what we delivered and presented to students. It would promote teachers’ sense making of their students’ thinking as to find ways of focusing their thinking into the idea of multiplication. It also would help teachers to make prediction and anticipation of students’ learning.

**4.1.2 Predicting and anticipating student learning**

One of key feature of mathematical thinking in this lesson is counting skill. We did prediction and anticipation of student learning by presenting a cube with 64 cube units. We asked teachers to find out how to count that resulted in 64 units. Figure 1 illustrates teachers’ predictions. By considering

students’ ways of thinking, teacher can make anticipation to support their learning in practice.

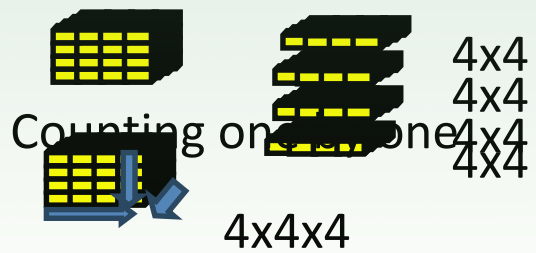


Figure 1. Predicting students’ thinking

**4.2.3 Hop-Step-Jump**

We will illustrate the notion of hop-step-jump through our analysis to the observed lesson. This teaching tactic aims to engage students thinking for all. In short, hop stage is intended to invite all students to learn by experiencing a necessary to think. In this stage, teacher presents the core problem, for instance, “There are 64 cube units of a cube. Explain how you find out way of counting them?” It is assumed that teacher will find students’ ways of thinking as predicted in Figure 1. Step stage aims to provide opportunity for slow learner to think appropriately; for instance, those who make counting one by one. Teacher may present the problem as follow: “Explain how you find out way of counting 8 cube units of a cube!” By making a reduction, we intend to promote the exchanges of ‘counting language’ among students that lead them to find out the idea of multiplication of three variables. Finally, we engage all students to apply previous thinking or to jump. Teacher may ask: “Explain how you find out way of counting 60 cube units of a rectangular!” Figure 2 illustrates the arrangement of hop-step-jump approach as it is assumed to promote formulation and validation situations.

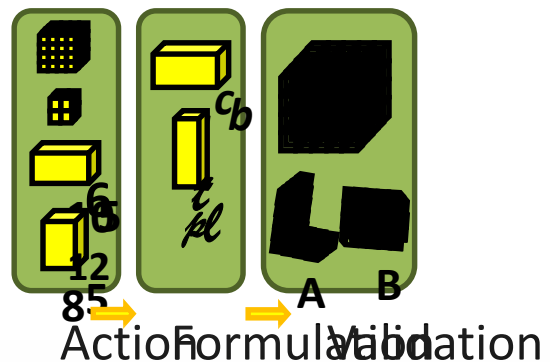


Figure 2. Arrangement of hop-step-jump that promotes formulation and validation situations

## 5 CONCLUDING REMARKS

Based on observed lesson, children faced didactical obstacle by which teacher design the lesson that could inhibit mental action of students as it was expected. We call it the problem of unity by means of logical arrangement of didactical situations of action, formulation and possibly validation could not fully be structured. The tactic of hop-step-jump which is based on the practice of acting like students and predicting and anticipating students' thinking may shed light on how we design such lesson. Although this is a hypothetical design based on reflection of the observed lesson of the volume, DDR and metapedadidactic framework provide thinking tools for teachers to analyse didactical situation and the criteria of unity, coherence and flexibility by focusing on critical mathematical thinking taught. In addition, hop-step-jump tactic is designed to promote collaborative learning by considering possible learning obstacles (particularly for slow learners).

Our experience reveals harbinger of knowledge-creating process of teaching and learning through lesson study enriched by DDR and metapedadidactic framework. The framework and its associated thinking tools (such as didactical situations; learning obstacles; learning trajectories; and didactical assessment) constitute knowledge assets. Hence, series of DDR workshop, that promote Socratic questioning, repersonalisation, dialogic inquiry, classroom observation and reflective practice, provide a powerful ba.

Establishing a team of mathematics teachers that work together with teacher educators promote four types of ba that support and speed up the process of knowledge creation: 1) originating ba is where individuals socialize to share feeling, ideas, belief, care and commitment; 2) interacting ba is the place within which individuals establish specific team and make productive dialogue to reveal explicit knowledge; 3) cyber ba is the place for virtual interaction in combining explicit knowledge; 4) exercising ba facilitates the conversion of explicit to tacit knowledge through real life application: lesson design, classroom practice, observation and reflection.

The workshops also indicate how knowledge conversion through SECI model is enacted: 1) socialization is facilitated by Socratic questioning; 2) externalization is promoted by dialogic inquiry; 3)

combination is strengthened by using thinking tools; and 4) internalization is actualized by examining three pedagogic discourses found. Finally, the hypothetical design starts the new cycle of knowledge creation.

Such lesson study sessions enriched by DDR and metapedadidactic framework as ba provides teachers argumentative-reflective practice for knowledge exchange and transformation through the SECI model. It is a dynamic process undertaking by a series of self-transcendental from which ba provides integrating conceptual metaphor, such as the notions of acting like children, predicting and anticipating student response and hop-step-jump. To sum up, knowledge-creating process involves three elements of SECI, ba and knowledge assets. Nonaka and colleagues (2000, 22) conclude that “Using its existing knowledgeassets, an organisation creates new knowledge through theSECI process that takes place in ba. The knowledge createdthen becomes part of the knowledge assets of the organisation,which become the basis for a new spiral of knowledge creation”.

Our approach to knowledge-creation through lesson study is based on our believe that improving teacher knowledge and expertise might be seen from bit by bit development in understanding the whole range of students' learning, i.e. their thinking. It is incremental in nature though it is hard to be sensed by most of teachers. However, it underlies the development of teacher's cognition and intuition. Therefore, teachers' expertise in making sense of students' learning and development from time to time is of paramount important. Spillane, Reiser and Reimer (2002) suggest that teachers as sense-makers are influenced by values, emotions, and motivated reasoning as well as by social environment. The dynamics of LS practices enriched by DDR and metapedadidactic framework insist that knowledge is created and shared between and within agents across time and materials.

Our attempt suggests that integrating school improvement and professional learning by focusing on teacher thinking for knowledge-creating process may be facilitated by means of: 1) repersonalisation to the curriculum that students study; 2) based on lively classroom setting; and 3) connected to several dimensions of teaching and learning (e.g. didactical situations and learning obstacle-trajectory). It is common that in the process of analysis there will be a contradiction among observers; however it is a trigger to the teachers' realisation towards the recontextualisation on the situation they encounter. This is the key factor that encourages teachers to

keep thinking and improving that grounded from collective efforts.

We would argue that the interconnection of professional expertise and knowledge underlie the key role of schools as the real learning place for everyone. Little (1999) asserts the needs of organizing schools as learning community to establish the culture such as ‘norms of collegiality and experimentation’, ‘collaboration and innovation’ and ‘collective work in trusting environment’ that engages teachers to dig into students’ learning and put together shared responsibility among them.

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## A Lesson Study Network in Bandung: Focusing on Designing Teaching and Learning

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**Abstract:** One of key challenges in enhancing the quality of lesson study in Indonesia is the fact that most participating teachers facing difficulties in creating a meaningful lesson. This presentation discusses a lesson study network developed specifically for transforming its members' conception and belief system about designing teaching and learning through critical reflective practice. The network consists of faculty members and student teachers from a teacher institution along with a group of teachers from a private primary school in Bandung. The aim of the network is to develop the framework of teacher learning in order to promote dialogic inquiry in the field of teacher education and school improvement.

**Keywords:** Lesson study network, lesson design, teacher education, school improvement.

### 1 INTRODUCTION

In Indonesia, there are several types of lesson study conducted by various agencies and networks. Subject teacher-based (LSMGMP) and whole school-based lesson study (LSBS) are considered as a classic example. Both were formally arranged and structured in the context of partnership or cooperation between teacher education institution, local education office, subject teacher group and school. Meanwhile, a so called Lesson Study Club (LSC) was established voluntarily by a group of committed teachers and educators across educational institutions that embrace powerful and meaningful learning community. In fact, they are participants of LSMGMP and LSBS but they are eager to understand lesson study better so as to improve their practice. Therefore, teachers from various schools work together informally and flexibly to enhance their sense making towards student's learning.

### 2 THE CONTEXT OF STUDY

This study reports a different network of lesson study that promotes collaborative inquiry between teacher education institution and school that has been initiated since 2012. Such limited and informal partnership involves three faculty members, a group of student teachers, a group of teachers and leaders of a private primary school. The school has conducted a self-initiated lesson study since 2009

with very limited network and access to lesson study experts.

There are several reasons why we undertake small scale collaboration. First, as teacher educators we are seeking a school that is committed to learn together; and vice versa. The school is also seeking a committed partner to improve the quality of lesson study. Second, such collaboration is intended to promote transformation in teacher education and school, particularly the culture of thinking, working and interacting in upbringing children and next generation of teachers. Third, we are learning together by focusing on developing framework for teacher thinking and knowledge base of teaching and learning by dealing with teacher belief system in order to make progressive change. To articulate such change, narratives of experiences representing teacher educator, teacher, principal and student teacher will be discussed in the presentation.

### 3 CONSTRUCTING THE NETWORK

We develop the network as a shared context for learning in which knowledge base of teaching and learning is embedded. As knowledge is intangibly placed in the individuals or groups, it will be best acquired through direct experience or reflection on the experience of others. As Nonaka and colleagues (1998; 2000) argue that in creating knowledge it needs two kinds of knowledge, i.e. tacit and explicit

knowledge, interacts. Explicit knowledge can easily be expressed in various forms and transmitted between individuals as we read for example the text book or manual. On the contrary, tacit knowledge is invisible and inexpressible as it is rooted in one's action and experience. Tacit knowledge includes technical skills or know how and cognitive dimension such as belief system and mental model that shape how one perceives the world.

Considering research on teacher thinking and learning may shed light on knowledge development approaches: 1) knowledge for practice (i.e. subject matter, pedagogy, and theories of learning); 2) knowledge in practice (i.e. practices of curriculum, instructional and assessment); and 3) knowledge of practice (i.e. accumulated theoretical and practical knowledge) (Hammerness et al., 2005). However, managing both teacher knowledge and thinking through lesson study is both important and yet difficult. Literature review has shown that the notions of expansive knowledge (theoretical vs. practical), adaptive expert (efficiency vs. innovation) (Darling Hammond, 2006; Darling Hammond & Bransford, 2005), practice-based professional education (analysis of disequilibrium) (Ball & Cohen, 1999), knowledge creation theory (tacit vs. explicit knowledge) (Nonaka & Takeuchi, 1995) and activity theory (analysis of contradiction) (Engestrom, 2001) all discuss about discrepancies in terms of thinking (cognitive) process and content of knowledge. Hence, dialogue of different point of views and networks might provide spatiality and temporality for transfer and application in the workplace learning. Therefore, neo-Vygotskian views that knowledge and expertise are generated through vertical and horizontal dialogue. Hence, promoting thinking culture within professional learning community requires dialogic inquiry (Wells, 2004). Therefore, we construct the network as presented in the Figure 1.

#### 4 INQUIRING THE DESIGN OF TEACHING AND LEARNING

One of key challenges in the implementation of lesson study in Indonesia is the fact that mostly teachers could not create a powerful lesson. This issue is related to the notion the design of teaching and learning. It will be difficult for teachers to reflect on a lesson without a well designed preparation. In fact, it is our network's concern in which our work is focusing on developing framework for the design of teaching and learning. We would argue that in Indonesia to improve the quality of lesson study is to improve the quality of lesson designing.

Through dialogic inquiry on interrelated perspectives, our team has further developed the thinking tool called Didactical Design Research (DDR) introduced by Suryadi (2010; 2013). It represents the very nature of teacher thinking regarding: 1) how teachers develop relationship directly with students (pedagogical relation) and relation mediated by teaching materials (didactical relation) (Kansanen, 2003); and 2) how teachers design, implement and reflect on teaching-learning processes.

One of key issues to be studied is the relationship between teacher's and students' thinking from which teachers could develop their teaching sequences and strategies. Therefore, analysing teaching-learning should focus on key features of didactical design: 1) didactical situations; 2) learning obstacles; 3) learning trajectories; and 4) authentic assessment. According to Brosseau (2002) there are three learning obstacles as epistemological, ontogenic and didactical. In short, ontogenic obstacle relates to the gap between the level of student thinking and internal logic embedded in the didactical design presented by teacher. Didactical obstacle results by the way teacher design the lesson that hampers the learning trajectories of students.

Epistemological obstacle represents limitation of student understanding that hinders him/her to expand understanding to wider context. Meanwhile, authentic assessment comprises of students' interest and affect, mathematical or scientific thinking, representational skills or inquiry skills, and conceptual understanding. Finally, learning trajectories represent logical sequences of previous, current and future content to be taught. Therefore, teacher should consider the interrelated mental processes embedded in the teaching materials.

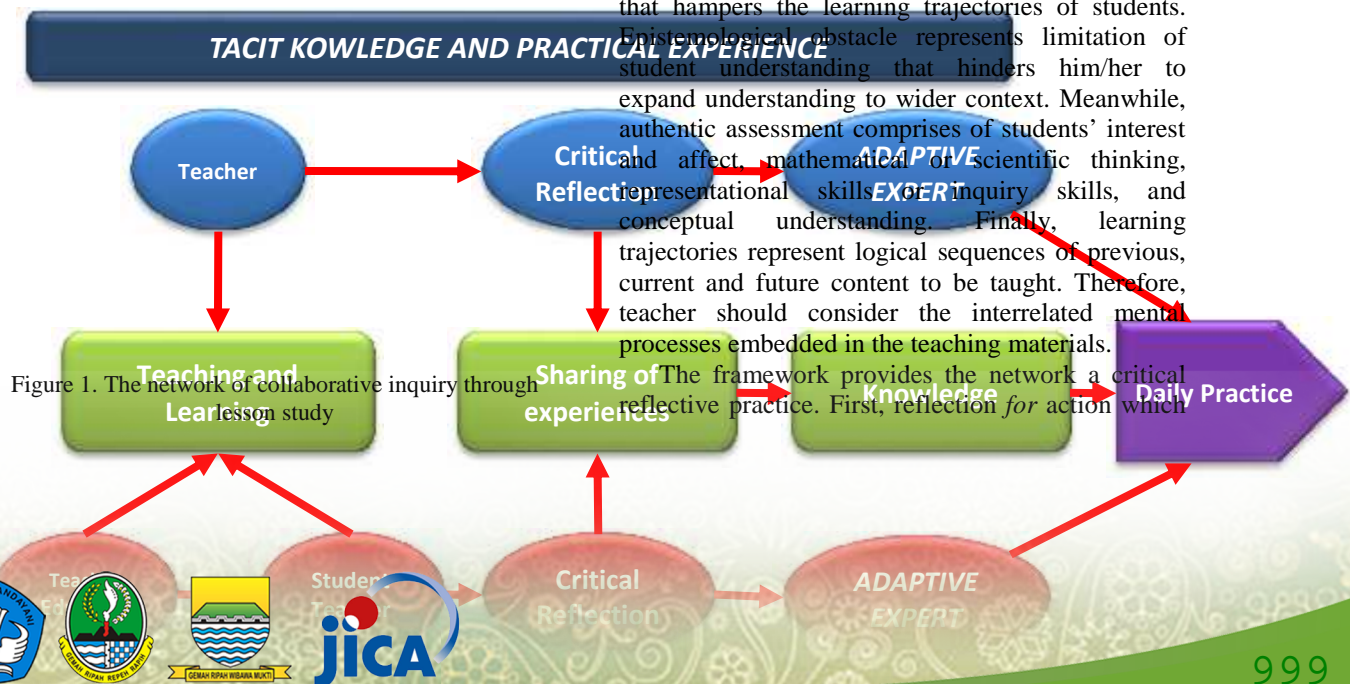


Figure 1. The network of collaborative inquiry through lesson study

is undertaken by a teacher before the lesson conducted. In doing so, teacher does prospective analysis by means of recontextualisation and repersonalisation the content to be taught as to make curriculum analysis. That way, teachers think and act as if they are students. Second, reflection *in action* in which teacher analyses classroom situations as to base his/her pedagogical decisions. Third, reflection *of action* is conducted after the lesson finished. In this way, teacher might involve other colleagues to do retrospective analysis by means of comprehensive inquiry about what was designed and what was happen in classroom. In doing so, teachers can discuss the interrelation of didactical design, didactical situations, learning obstacle and learning trajectory, as well as authentic assessment.

As teacher thinking processes happen before, during and after the lesson, the overall processes are complex in nature. We would argue that a good quality of teaching-learning should achieve the following criteria: 1) unity (of situations); 2) coherence (of logical sequence of situations); and 3) flexibility (in dealing with students' learning obstacles and trajectories). It is through such key ideas teacher can base his/her reasoning in dealing with the complexities of teaching and learning. In the presentation, a highlight of lesson designing activity will be discussed.

## 5 CONCLUDING REMARKS

Lesson study undertaken collaboratively, besides being able to produce a change in culture of thinking, working and interacting, can encourage the establishment of a community of educators, lecturers, teachers and prospective teachers in the context of teaching and learning endeavour. Such synergy is mutually empowering academically in building a socio-cultural context of teacher education and school reform. Experiences of faculty, students, principals, and teachers in lesson study activities bring impacts of change in mindset and practice of education, thus far in terms of the design of teaching and learning.

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## LESSON STUDY: A NON-INSTANTANEOUS VALUABLE EXPERIENCE

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**Abstract:** Teaching is easy for teacher, but creating a lesson which enables all students to learn and understand is another story. Moreover, if students' characters in a class are so heterogeneous, it would take particular sense from teacher to facilitate their learning. Through lesson study, teacher could enhance and sharpen their competence so that they could develop better sense toward students' heterogeneity. However, such competence could not be achieved instantaneously. It would take a long process and strong commitment from teacher.

**Keywords:** Lesson Study, teacher competence, personal journey.

### 1 A FLASHBACK TO THE FIRST TIME KNOWING ABOUT LESSON STUDY

When I heard about lesson study for the first time in 2006, there were a lot of questions running in my mind, such as: “Another new project, *huh?*”, “How long is it *gonna* last?”, “Is it another new teaching model?”, “Can it enhance students' understanding in Math lesson?”, “How is it different to previous programs?”. At that time, the three steps in lesson study, i.e. plan-do-see, were explained. I said to myself, “Ah, what is so special about it?” All this time lesson always go through those three steps anyway, it is planned, done, and reflected afterward.

It was still awkward at the first meeting for plan session with MGMP teachers (subject matter group of teacher). I felt nothing special. We made a lesson plan that was going to be implemented in a class after choosing a model teacher. How the model teacher was chosen was interesting in a way because all teachers were reluctant, including myself. It is not easy to be observed while teaching and it also feels like an invasion to your privacy. At that time, Mr. Zaenal agreed to be the first person to “sacrifice” himself and chose the summation of common terms as the topic.

The first time being an observer, I was confused of what to observe and what to record. Once in a while, my friends (other teacher) chatted with me, hehe (giggle). Most of the time, I focused on observing the model teacher who was sweating so much. He might be panic, but he obviously looked so nervous. I got very little note on students, and that was not even clear.

After “watching the lesson”, there was a reflection. This session is a whole new thing to me and I had no idea what to say. More to it, Mr. Dadang Juandi and Bu Entit Puspita, lecturers from UPI who support MGMP teachers in our area, kept reminding observers not to criticize the model teacher. During the reflection session I thought, “Ah, even this reflection is so flat”, and I said to myself again, “nothing special to it”.

The first round of MGMP Lesson Study passed just like that without any significant impression on me until another round came up. I had to join the MGMP for the plan session again, and oops! Model teacher will be selected again! “Ah, this is not fun”, I thought. This is just a waste of time! The model teacher for this second round was Mr. Oih from SMP Plus Al Aqsha and ...ME! I said to myself, “Ah, whatever, I'll just do it no matter what”.

Compared to the previous time, I was more serious since I would be the model teacher. Mr. Oih picked the area of circle as his topic, and I picked application of Phytagoras Theorem. I thought I had picked an easy topic, because I just have to pose the problems without explaining the concept. During the plan session, a lecturer informed us that one of the open lessons would be visited by JICA expert. I was terribly shocked and I regretted my decision to be the model teacher.

The time for Mr. Oih to open his class finally came. As it was planned, the JICA expert who came to visit was Mr. Masaaki Sato. I was extremely happy. Thank God it's not my class to be visited. Just like other previous model teachers who were reluctant to be visited, I felt the same way too.

Mr. Oih conducted his lesson step by step, started with determining the center of circle. Students were asked to make a circle from any

circular things and then cut it. The circle cut is folded into two equivalent parts. The fold is then opened and folded the same way on different side. It turned to be a way to find diameter, central point, and radius. It might be simple but it's very important for students to know. Students were divided into several groups of 4-5. They were given a task chosen from a lottery game, which was to shape a plane from cuts of pie from the circle. For the next step, students who got the task to shape a parallelogram and triangle divide the circle into 16 equivalent pies. The students had no particular difficulty doing this part. To the group who got the task to shape a rhombus, they have to cut the circle into 20 equivalent parts. Model teacher remind the group to use a protactor to make the pies with central angle of  $18^\circ$ . This part was a bit difficult because some students were not able to do it since they were not used to the protactor. Model teacher intervened students' learning several times, so it made the lesson seemed so tiring. Students were seemed not confident with their work, and always longing for model teacher to come over and ask. Just like the first time being an observer, I still haven't got any clue of how to observe students.

## 2 VALUABLE EXPERIENCE DURING REFLECTION

The reflection of this lesson also started with the same comments as before, it was flat and nothing special. As a matter of fact, I said to myself repeatedly, “why should they give comment about my lesson? What benefit would it do to me?” I didn't give any comment because I had no idea what to talk about. My heart was so restless and I couldn't wait to end the meeting until Mr. Masaaki spoke. Between the desire to go home and curiosity, I forced my self to stay. Accompanied by the interpreter, Mr. Masaaki spoke in front of us while showing some pictures taken during the lesson. At that time, I was like “Aaaaah...” I was so amazed by Mr. Masaaki's comment. How could he observe students who were just playing around during the lesson and those who were yawning or daydreaming. Our MGMP teachers also burst into laughter while looking to those pictures. Ah, so this is what it means to observe a lesson, it is about to see students who were learning and were not. Mr. Masaaki also showed some pictures of students' bright faces at the end of lesson, which was just a few. So that was it, beside looking for those who were not learning, to observe also means to look for students who were smiling at the end of lesson. I set my heart at that time. When I become the model teacher next time,

that is what I have to prepare: how to make students smile happily.

The plan for my open lesson had to be revised, but there was no time left for MGMP. Then, it was decided to be discussed with fellow teacher, particularly with Mrs. Endang, the facilitator for our homebase. Mrs. Endang suggested me to implement Numbered Head Together(NHT) method for the open class so there will be no opportunity for students to play around. Besides, this could be a good opportunity to introduce NHT method to other teachers. Mr. Dadang from UPI also reminded me to prepare all tools required. I felt like a fool, I just followed their instructions without asking further about how students would react to it. I just thought that I have to teach and many people will observe me, and it has to be fun.

One thing which came from my own initiative, and because it has become a habit to me, I prepared “kartu curhat”, a card to share students feelings that I have always used. At the end of lesson, students were asked to write on those cards about their understanding or their feeling toward the lesson then I would give my comment to it. The cards serve its function more as a tool for communication between me and my students.

## 3 THE FIRST OPEN LESSON AND REFLECTION

I conducted my first open lesson as it was planned and I thought of it as a fun activity. During reflection, it was revealed that the students seemed to have fun in the 2-hour lesson but the reason to it was not clear. There were only 2 problems completely solved in the class. It turned out they were talking about the football team from Bandung (PERSIB) who was going to have a match in the afternoon. Besides, there were some misconceptions among the students regarding algebraic operation and in applying Phytagoras theorem. More to it, the tools that I prepared to support the lesson didn't support students learning. I finally came to a conclusion that teaching is not only about helping the students to have fun or smile. I found myself misinterpreting what Mr. Masaaki said earlier about creating smile at the end of lesson. It is not merely a smile, but a bright expression which indicates satisfaction from being able to understand the lesson well.

In that reflection, I also learned from previous reflection that some colleagues were busy mentioning students A and B were not learning. All was just like observation reports only. Teachers were still giving report of who were being active and who were being quite. This way of reflection last for

quite a while, we were reporting that the quite students didn't learn repeatedly. During that time, most of us were still thinking of the open lesson as a teaching show, so it should be different from daily lesson. Despite these facts, I found myself feeling excited to ask Mrs. Endang for latest information every time she got back from facilitator training.

#### **4 BECOME A FACILITATOR IN JATINANGOR**

Early in the third year (2009), there were some positive movements from the MGMP in our area (Jatinangor, Sumedang). For instance, Math teachers in our MGMP were more open in discussing problems encountered in daily lesson and how to deal with students. We started thinking about what tools or media would be suitable for certain topics. However, in observing students, we haven't done much to it. We still discussed about seating arrangement, number of LKS (students' worksheet) whether it should be given for each students or group, and we keep saying that the quite students didn't learn at all.

In the same year, there was a historic day in my learning journey about lesson study. Our facilitators (Mrs. Endang and Mr. Tandi) told us that according to Educational Office (Dinas Pendidikan) for Sumedang District, there had to be a replacement for facilitator. Mr. Sirodjudin (our principal and the head of MGMP for our homebase) asked me to run for it. Mrs. Endang also agreed with the idea. I started to doubt myself, "should I go for it?" The same question kept running in my head, I was totally confused. Because Mr. Sirod (this is how we call our principal) was so persistent in asking me, I finally agreed to be nominated as a facilitator. I tried to calm my nerve by keep thinking that this is not final yet.

On the day where facilitator would be chosen, Mrs. Endang reminded us that according to the instruction from Dinas Pendidikan, there should be two facilitator, one from public junior high school and one from private. The process was just like how a chairman in class was chosen. Mrs. Endang led the voting, she asked everyone in the room to write two names for candidates who fit the criteria from Dinas Pendidikan. It was beyond my expectation that major vote chose Mr. Deni from SMP PGRI Parakan Muncang (private) and ME, by only one vote difference. Finally, it was decided that there is no need for further voting. I said to myself that my friends had made the wrong choice, because both Mr. Deni and I belong to the out-of-the-box kind of teacher. But my heart kept telling me that I have to

be reliable, my friends put their trust in me so I must take this seriously. Moreover, I started to fall for lesson study. I really liked it, especially as a place to meet my colleagues and share ideas with them besides visiting other schools.

#### **5 FACILITATOR TRAINING: SUPPLEMENT TO ENHANCE MY ABILITY TO-LESSON-STUDYING**

I grew fond of Lesson Study as time went by, especially every time I joined facilitator training. Just a special supplement, this training gave a kind of power to learn more about lesson study.

I felt a little bit awkward at the beginning. Why there is no lecture about theories of doing Lesson Study and how to improve our competence in the facilitator training? Instead, why would we have to open the lesson, see how the lesson runs, and then reflect on the lesson just like what we did in base camp? (Oya, basecamp is the area of MGMP meeting in Sumedang). In Sumedang, there are 8 basecamps and my school is the central location of MGMP activity in basecamp A. I was confused of open class that we had in basecamp and in the training but I found more to learn there. I was trained to sharpen my ability to observe. I found a new community, the facilitators from eight basecamps whose observation ability way much better than observers in my basecamp. I learned a lot from their comments during reflection. And what is more valuable for me is that in every training, there was always JICA experts who came to enhance our knowledge in observing and reflecting. I also became more motivated to learn about Lesson Study.

#### **6 LESSON LEARNED FROM OPEN LESSON**

We could learn many things from every open lesson. Since I know about lesson study, I have been a model teacher for several times. From one open lesson to another, I got a lot of things to learn especially after I heard observers' comments. At least, the most obvious improvement that I can tell is that I have changed from being reluctant to be a model teacher to being a volunteer.

My first open lesson has been discussed earlier, which was full of doubt and very inefficient in time management. My second open lesson was when Mr. Masaaki Sato from JICA expert came to visit our school. On the day before at 4 pm, I was told to open

my class. Even though I wasn't nervous at first, the sudden notice quite made me restless. Just based on what I was supposed to teach tomorrow, I prepared my lesson alone with the topic of Arithmetics and Geometric Sequence. During reflection, I learned that in choosing the problem, we should consider putting the problems in order, from the easiest to the most difficult. At that time, one evaluation problems that was considered far from the lesson was how to determine the number of piece of paper when it is divided into two equivalent parts for five times. Mr. Masaaki suggested that the problem should be posed during the lesson because it was related to the main concept. The reason behind this suggestion was that there were many students got confused about the problem but they couldn't ask to their friends since they were in evaluation.

My next open lesson is more likely to be called a disaster (haha...). In August 2010, Mrs. Kikuchi from JICA came to our school to observe Science lesson. Perhaps, she intended to see the daily lesson in our school because after the open lesson finished, she visited my class. Of course I had no preparation about it and the lesson ran as it was. The topic was multiplication and division of fraction. During reflection, Mrs. Kikuchi commented of positive thing that I did, which was giving a lot of opportunity to students to create alternative solutions to each problems so that the students were challenged to think continuously until they got the answer. Another interesting from Mrs. Kikuchi is that how I chose money as learning media, which enable students to get into the lesson easily. However, Mrs. Kikuchi also expected me to prepare more various problems for the topic that can be challenging enough for the students to solve it.

At the beginning of 2011, there was a facilitator training in my school. Automatically, the teacher from my school has to open her or his class. What is interesting from this open class is that the preparation was supported by Mr. Ryo Suzuki from JICA and Mr. Encang Jana from SMPN 1 Tomo. I learned a lot from both of them. There are surely a lot of things should be prepared to design a lesson that really can help students to learn. In other words, a teacher should be able to facilitate students' learning. The topics at that time were intersection and union of sets and how to draw Venn diagram.

Usually, lesson about that topic requires two until three periods. The first period started with the definition of set intersection until determining the intersection of two sets, definition of sets until determining the union of two sets. In the second meeting, the students could learn about drawing Venn diagram and the law of de Morgan which is related to the intersection and union of set, which usually confuse the students until the next meeting.

Based on this experience, I was doubtful when Mr. Ryo suggested that the topic of set intersection to be taught together with the union of two sets even with the drawing of Venn diagram included.

In that plan session, I was introduced to how to design a lesson for the first time. Lesson design (LD) which is more likely to be recognized as lesson plan (RPP), is much more difficult to create than what I imagined. The steps to create a lesson design are started with choosing a topic, planning the evaluation, thinking of how the students should learn the topic, and formulating the learning objectives. There are two type of learning objective, the objective that teacher expects and the objective to help the students focus on and be challenged to learn the topic. The most difficult thing in creating a lesson design is to predict students' answers, to predict students' difficulties, and anticipation from teacher to those difficulties. I was like trapped in confusion so I couldn't answer questions from Mr. Ryo fluently. Even choosing learning tools is not easy, I should really think of how to make the tools to be really helpful in lesson, and not turning into another problem.

Each step that we've been through was always tested with little simulation among ourselves. Here, I learned again that trying to put ourselves as students who don't have any understanding of the concept being taught, is really something I have never done even for once. Mr. Ryo also reminded us to be more patient in giving students time to think. I was startled. I realized how I have wronged my students because I have always thought that they could always keep up with my thought. It seems like all this time the students were forced to follow teacher's thought, tough it is teacher who should be able to follow students' thinking. Another valuable experience is that after everything is prepared, Mr. Ryo suggested the design to be implemented in other class be reflected afterward. The result from that reflection could be used to improve the real open lesson.

On the D-Day of open lesson, I was highly influenced by Mr. Ryo's suggestion that students should be given time to think. However, because the portion was not so fit, I wasted the time again. It happened when the students were allowed to draw Venn diagram on the small board for too long. (The small white board was one of media for students to discuss in group. Because with the help of the small whiteboard, students could write feely, erase it, write again, and erase again repeatedly until they find the proper concept/answer).

In the reflection, there was a debate which gave me another lesson about the proper portion to let students think with intervention when they faced difficulties. It means, teacher should be sensitive to

this because if this situation is allowed to last longer, it can reduce students' motivation. Besides, this is also important for the sake of lesson effectiveness. This idea was what I can infer from Mr. Koji Sato's comment at the end of reflection.

I had to open one more lesson suddenly when Mr. Masaaki Sato visited our school. At that time, I was going to teach two lines being intersected by other lines. I did the preparation alone according to the topic I was going to teach. During reflection, I got more lessons like in giving name to the lines I should pay specific attention in order not to make students difficult to think. Students would be easier to think if the material is arranged in order, not moving from one to another randomly. Moreover, if it is arranged from abstract to concrete unsystematically, it would really cause the students to be confuse endlessly.

## 6 AN OPEN LESSON THAT GIVES INSPIRATION AND MOTIVATION

The most memorable open lesson to me is when Mr. Manabu Sato visited Indonesia. When I got informed from Dinas Pendidikan to open a lesson which would be observed by Mr. Manabu Sato, I was in doubt. However, thinking that I would get a lot of thing to learn, I finally agree to open my lesson. I believe I will get an opportunity to learn this time.

Just like what I had expected, open lesson this time would involve many people, such as from facilitators, lectures from UPI, and JICA experts. I was so happy because more comments mean more lessons. Even, there were several preparation meetings for this open lesson. During the preparation, the most valuable lesson I learned was when Mr. Masaaki Sato suggested that the lesson should be related to National Exam problems under the topic of Function which I was going to teach. From the problems, he moved back to the material. There should be a way to help students to learn the concept so they can solve those problems. At first, I allocated the two-hour lesson just to cover the topic of relation between two sets because usually the first meeting for this chapter would always have that topic. However, beyond my expectation, Mr. Masaaki challenged me to teach until the students are able to differentiate common relation to function showed by arrow diagram. (Hahaah... how could that be possible? I started to feel pessimist, but I kept trying to understand the way he thinks. This is a challenge, this is a lesson, I kept repeating those sentences in my mind).

The discussion went tough for quite a while. Mr. Masaaki asked me several times, it seemed like he was worried or afraid I might look confuse (as a matter of fact, I was really confused). I immersed myself in that confusion until I grasped the lesson I was going to teach. However my heart still doubtful, will the time be enough? Started from making a set, relating two sets with a relation, naming the relation formed by two sets, and differentiate common relation to function. All these topics normally required three periods (3 x 80 minutes). All I had to do was to challenge myself through the first trial the next day.

The trial was conducted in class 8B, the best class I had at that time. I conducted the lesson as it was planned. It turned out to be different to my expectation, especially about the time. Those many topics were finished in 85 minutes! I thought this was my best record so far since I usually do it longer. During reflection, learning activities which still required much time were discussed, for example: waiting for the students who were low, choosing the right problems for evaluation, and teacher's sensibility in choosing students to perform in front of the class, to be asked, or to be instructed to help other students. The 'help' here is different to what I used to think. I understand "help" is about helping students to solve the problems. In fact, the "help" here could be interpreted in another form. For example, when we choose a low-ability student to do something in front of the class, this could motivate that student to solve the problem. I was like, "Aaaaah... I got another lesson!" Then, a teacher should be sensitive in helping low-students. Instead of asking the clever students to teach the low-ability, teacher should ask those low-ability students to ask other students. Even though the goal is the same, the result would be different because the students who asked usually pay more attention to his/her friend than when they are being taught.

Based on the experience doing the trials and revisions from reflection, I opened a lesson which was observed by Mr. Manabu Sato, JICA experts, officers from Dinas Pendidikan in Sumedang district, lecturers from UPI, and fellow teachers. Surprisingly, I enjoy the lesson as soon as I stepped in front of the classroom. Some turn-outs in class matched our predictions. This is also another lesson I gained, so the plan should be detail in order to anticipate any turn-out in class. And my trial record was broken again, the lesson finished in 75 minutes! Nevertheless, JICA-experts adviced me that I should try to make it only in 50 minutes after having practice like this. I laugh to myself, another challenge. This means, I have to plan a lesson more effectively whenever I am going to teach in class.

The most memorable reflection I had of course the one with Mr. Manabu Sato. He was so detail in observing. Waah, I would really like to be like him in observing students, knowing what students feel during lesson, knowing their difficulty to help they learn (not to help them solving problems). In one period only, Mr. Manabu could notice many things about my students. Meanwhile, I who have met them several times, didn't even notice that much. What a very valuable lesson! What I could still remember vividly in mind is that he counted that I gave 27 questions during the lesson. He counted it! In the beginning, the students were chosen well because those students could answer my questions. However with panic expression in teacher's face, when the lesson was about to end, the teacher was kind of in hurry so teacher tend to pick students who most likely would be able to answer the question. This is another lesson I should apply in my own class. Another thing I should keep doing in my own class is to reduce intervention to students learning. Instead of intervening too often, I should prepare the lesson in detail so that the students could learn and teacher could facilitate their learning.

After knowing and implementing lesson study for a while, I learned a lot. I felt really lucky because there are may be only a few teachers who got the opportunity to learn about lesson study and keep doing it. I also feel lucky because fellow teachers in Sumedang still have the motivation to discuss the lesson through lesson study. If we stop doing it, we are afraid we might have malpractice in teaching without having a chance to revise it. I also feel really lucky to keep doing lesson study even though I doubted I could improve my competence during my first years of lesson study. It is true that the effect of lesson study felt significant after several years of implementation and it also requires consistency and commitment. If you are just joining the activity, you might take longer to feel the effect. In lesson study, everything would not be like “Abracadabra”! From every meeting, you will gain little by little until it builds up to be a whole huge benefit. As a matter, it's better to gain little by little and then followed by implementation, rather than to gain much but limited to theory only.

## Fusion with Children: The Lesson Study Club

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**Abstract:** In Indonesia, there are various forms of Lesson Study. In this presentation, we will highlight the so called the Lesson Study Club (LSC) which is informally and voluntarily conducted by a group of teachers in Banjarbaru, South Kalimantan. The aim of LSC is to improve our sense making towards student learning. Hence, we learned how to comprehend the overall development of student learning so as to enhance classroom practice. In the presentation, we will depict how we conduct LSC, what thinking tools used and what the practice of improvement occurred and distributed among LSC members. We strongly believe that to be reflective practitioners, we should emphasis on ‘what can we learn from students’. It teaches us to learn from and with students and small change in teachers will be a miracle for the students.

**Keywords:** Lesson Study Club, learning from student.

### 1 INTRODUCTION

It was around 2008 – 2009 when teachers in Banjarbaru were introduced to Lesson Study. At that time, Banjarbaru was assigned as one of the new sites for Lesson Study program. Teachers from different schools in Banjarbaru started to implement Lesson Study through MGMP (subject matter teacher group) and LSBS program (school-based lesson study). The MGMP-based and School-based (LSBS) lesson study program is still running in Banjarbaru, especially in SMP Negeri 8 Banjarbaru. Both of us are member of such activities.

Although lesson study is regarded to be relevant to improve teaching practice, mostly teachers perceived considerable obstacles: 1) it required time, energy and solid teamwork; and 2) it demanded support from local education authorities and principals. Such constraints imply that their participation in LS sought to fulfill administrative requirements. They were more focused on matters external to the teaching-learning process, such as incentive and training certificate. Hence, their meetings to accomplish LS uncovered a contrived collegiality. Though in practice the principle focus of LS is on student learning, it was only on the outside surface. We often heard that in the end they experienced boredom and felt exhausted. It seemed to us that they ‘must do’ something that they did not

consider their first priority. We often noticed that most teachers deem LS a ‘teaching show’. It implies a constant barrier to lesson study: teacher concern of having others observing their class and judging their work.

### 2 LESSON STUDY CLUB

In 2010 Japan International Cooperation Agency (JICA) supported the establishment of the Lesson Study Club (LSC) founded by a group of teachers that embraced meaningful learning community. They are teachers who extremely eager to understand lesson study. Therefore, LSC can be run informally and it is attended by teachers who are seriously keen to improve their practice. Hence, the members of LSC were few in number and were, in fact, participants in either LSMGMP or LSBS. The members of LSC were content to follow LS since they acquired insight that they could comprehend, particularly concerning students. This could have occurred because they felt freed from the burden of ‘obligation’ and obstacles pertaining to ‘structural-seniority’ as perceived when they followed LSBS or LSMGMP.

LSC consists of teachers from several schools, but mostly from SMPN 10 Banjarbaru. We conduct LSC flexibly as to avoid formalities because we aim to improve our sense making towards student

learning. One way to develop our sensitivity is to pretend ourselves as student. By doing so, we try our best to be collectively responsible in upbringing our students. It also gives raise our understanding and awareness to take care of students learning and their development above all other matters. How do we do such approach?

In implementing LSC, we use thinking tool called chapter and lesson design that engaged us in mapping out teaching materials and classroom arrangement. We learned it from Mr. Ryo Suzuki. He opened his class for a week in our school, SMP Negeri 10 Banjarbaru. By observing Mr. Rio’s class, it turned out our attention. The way he conducted the lesson and led discussion in the reflection session impressed us a lot. Hence, we started to be more open in doing lesson study. In addition, some other teachers gradually showed their interest to join. We now have committed members comprising teachers from MIPA (Maths and Sciences) subjects as well other subjects such as social studies and languages.

Teaching is indeed uneasy, as well as observing classroom practice. Our strategy is to identify several students who achieved a ‘breakthrough’; namely, those who quickly found the solution. Having predicted that some students would not succeed, we encouraged these students to meet with the ‘breakthrough’ students as to promote collaborative learning. In addition, we are trying to promote active and reflective learning for students in order to deepening their thinking process and connecting to their daily life. It is our concerns to design authentic learning.

In the reflection session, the focus of the discussion was on the identification of learning obstacles and breakthroughs experienced by the students (student-content relation) and of student collaborative work (student-student relation). Such kinds of comments demonstrate our sensitivity in understanding the student learning process. By doing so, we learned how to comprehend the overall development of student learning so as to enhance our teaching practice. We strongly believe that to be reflective practitioners, we should emphasis on ‘what can we learn from students’. It teaches us to learn from and with students as indicated by our motto: Fusion with children.

In the presentation we will illustrate how we conduct LSC. Since a picture worth a thousand words, a brief description of our LSC activities will be depicted.

First, *Plan* activity: the making of Lesson Design (LD), preparation of learning tools and materials, conducting pre-action, analyzing possibilities learning obstacles and trajectories, and reconstruction the overall lesson design, including predicting and anticipating student learning. Second, *Do* activity: description of do’s and do not’s for the model teacher as well as for the observers. Third, *See* session: typical impression from model teacher and observers, how did observer deliver his/her comment and how we shared what we learn from students, and how we redesign the lesson.

### 3 MAINTAINING LESSON STUDY CLUB

It was the willingness and initiative of teachers in LSc Banjarbaru to maintain the activities of LSc. They didn’t join LSc because the principal or vice principal forced them to. They joined the LSc because they had common language about the challenge of dealing with students learning, and the same concern about how to improve the quality of their lesson.

Until now, teachers in Banjarbaru keep on doing lesson study indirectly and informally through small discussions between them or even voluntarily opening their class to other teachers. Some teachers even voluntarily opened their class to fulfill the request from whoever who wants to see how the lesson was going.

In the future, we hope that this small step can be gathered as a one whole intention from all teachers to change little by little for a better lesson since “small change in teacher will be a miracle for the students”.



## Pattern Assessment Learning Science In Lesson Study of West Java and Authentic Assessment Curriculum Development Claims 2013

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Has conducted research on science learning assessment pattern for science teachers in West Java in lesson study activities. This study aims to determine how far the pattern of assessment conducted by teachers in learning science through lesson study. Lesson study as a teacher professional development program, providing a very open space for teachers in the development of learning assessment. Research conducted on a number of science teachers involved in the lesson study activities in West Java. The instruments used were the observation and interview, as well as analysis of product design is developed teacher learning has science in learning through lesson study. The results showed that the pattern of assessment, particularly in science learning, the development is still the dominant pattern in the type of assessment test pattern. Teachers do not use different types and varying assessment tools such as test and non-test. It is not yet able to assess comprehensively to various learning targets such as cognitive, affective and psychomotor accordance with the demands of the curriculum in 2013.

Keywords; The pattern of assessment, lesson study, learning science

### 1. Background

Science education in junior high school has an important role in the formation of intelligence and intellectual personality of the child. Generally, people familiar with science learning as a learning pattern that gives more information about the concepts of materials science in the form of natural phenomena or the environment, and also related to the principles and laws in science. However, if only in the form of learning patterns provide information only, then students can get stuck in a system that only rely on rote learning, so that students tend to get bored with learning system like this. That is why learning and assessment of learning science should continue to be developed in order to favor and interesting for the students to learn. As an integral part of the learning assessment has a strategic role in presenting a challenging learning and encourage students to think and develop different potential students. Therefore, the application of assessment is one important part of a learning process associated with student achievement. Pattern good assessment can provide a positive contribution to the learning process and will affect student learning outcomes (Anderson, 1996).

Based on observations in lesson study activities in the field, especially towards learning science in junior high school, carried out during the assessment

process is generally only emphasizes the mastery of concepts (cognitive) were captured with a written test objective and subjective as a means of measurement. So that this condition causes the teacher to focus less on skill development of children in the learning process.

This reality encourages students to memorize at any time will be held daily tests or test results to learn. Yet according Stiggins (1994) for students at the high school level should come first is how to develop a curiosity and critical power of children to a problem. Phenomenon above shows that the system of assessment used to measure student learning outcomes affects the learning strategy designed and carried out by the teacher. Correct assessment system is of course to be aligned with the goals and the learning process. Science learning objectives in the curriculum in junior high school in 2013, can be summarized into three aspects of learning objectives are mastery of the concept of science, skill development student performance, and planting scientific. Therefore so that student learning outcomes information can be revealed as a whole, it is necessary to measurement of the three aspects mentioned above. So that the objectives of the assessment of learning outcomes in the secondary high school includes all components related to the process and the learning outcomes of students in learning activities can be achieved. Surely needed

alternative assessment tool that is assumed to be able to achieve that include a performance test or performance test and other types of alternative assessments such as product assessment, portfolios, and other assessment called authentic assessment. Where according Stiggins (1994) with the authentic assessment can improve the ability of students with the students the opportunity to connect with the real world, demonstrating its expertise in authentic, and also the teacher can monitor students' abilities through the work - the resulting work students, of course, this is not obtained with tests that rely solely on paper and pencil. By applying the alternate assessment for students, can be collected evidence - evidence of student progress that can actually be used as a material consideration to improve the learning process further. According to Marzano (2007), in the authentic assessment tasks and situations difference given to the students as well as providing opportunities for understanding and truth indicate in the application of knowledge and skills according to the habit of thinking.

By reviewing the data that was collected in the field, reflecting the discrepancy between learning science in junior high with the use of a scoring system, which is the usual assessment process for teachers is only able to describe aspects of student mastery of concepts, so the subjects of Science curricular objectives can not be achieved thorough. It would require a valuation technique that is capable of revealing aspects of a product or process. Assessment system is assumed to be able to meet these demands is the assessment scoring system such as assignment, project valuation, and portfolio assessment are all referred to as authentic asesment. Form of assessment requires the assessment of competence and creativity as well as a broader initiative of students. In addition, the assessment also provides comprehensive information about the students' progress, including strengths and weaknesses. However, the reality in the field are still many teachers who do not understand fully authentic assessment, and also have not been able to implement good planning in designing autentic assessment. Besides the teaching load and the number of students who are not ideal in a classroom can also make it difficult for teachers to implement assessment autentic ideally. One assessment that can be applied to learning, especially learning in junior high SCIENCE is an authentic assessment that can reveal aspects of cognitive, affective and psychomotor student in the learning process. According Arends (2007), authentic assessment is an assessment that requires contextual

conditions, as for examples of what it can be incorporated into the student is autentic assessment tests, performance assessment, portfolio assessment and journals of the work that has been evaluated for compulsory student assignments, tasks duty performance, and work projects such as papers or other assignments made by the students themselves. Therefore, this study was conducted in order to reveal patterns that are generally applied in the assessment. So that by applying an assessment that is expected to accommodate the function, purpose and principles of assessment and also provide input for teachers in designing alternative assessment. The problem will researched in this study is a science teacher assessment in science learning by taking as a reference benchmark authentic assessment.

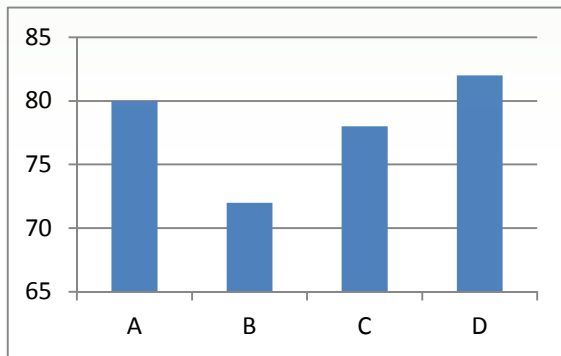
## 2. Research Method

This study aimed to examine the pattern of assessments conducted a science teacher in the learning sains. Benchmark assessment pattern used is the authentic assessment as appropriate to the curriculum in 2013. The research done using qualitative research methods and design case studies. This study was conducted in several secondary schools in West Java in lesson study program. Activities carried out at a school attended by teachers science who gathered in the main school. The activities carried out in 2012 in Bekasi, Subang, Tasikmalaya and Bandung. Research instrument in the form of questionnaire, guidelines for observation, interviews, and analysis of the products of learning the lesson plan in which there is a pattern of assessment developed by a science teacher. The data obtained and analyzed to determine the pattern and profile assessment authentic assessment conducted by a science teacher in science learning.

## 3. Results and Discussion

Based on the results of research conducted shows that in junior high science teacher has been largely understand the concept of a comprehensive assessment conducted. The teachers understand the concept of test, measurement, performance assessment and teacher authentic assessment. However apply the principles of assessment in terms of the application of authentic assessment learning. Only a small proportion of teachers who implement authentic assessment in learning. Teachers have difficulty both in software development authentic assessment, as well as in the application. Lead teachers use assessment test pattern that is easy to

plan and conduct. Pattern tests such as multiple choice tests and essays, is planned, created and implemented and is also analyzed the result. Meanwhile authentic assessment patterns that implement various assessment strategies are very complex and takes a long time in the planning, implementation and analyze. This is which makes the teacher chose a test pattern in any assessment of learning both in and sumatif. Comprehension formative assessment and teacher assessment pattern of the concept of assessment in percent more as presented in Figure 1 and 2 (n = 160).



Note:  
A= Tes, B=Measurement, C=Performance Assessment D=Authentic Assessment

Figure 1; Understanding teacher about the concept of assessment

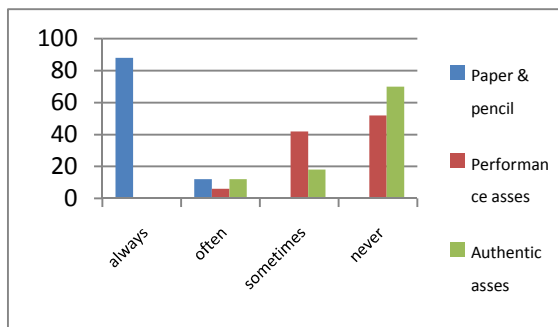


Figure 2; The pattern is applied teacher assessment

The results showed that the teacher has to understand the basic concept of authentic assessment, in which the teacher is able to identify the goals of authentic assessment before applying the science of learning, but it also looks a teacher has to understand the components that will be used in determining the type of authentic assessment, the results of the interview can also be seen that the teacher has has a specific format in determining the selection of authentic

assessments, teachers also have to understand that in the application of authentic assessment should determine the focus of assessment, teachers also have to understand the importance determine assessment criteria that will be used to assess the processes and outcomes of student learning and also have determined the form of reporting that will used to report the progress of students in the learning process to related parties, and the teacher has to understand the importance of the use of authentic assessment in the process of learning, especially learning of Science.

Based on interviews, observation, and documentation study revealed that there are some things that prepared teachers in preparing the planning application of authentic assessment in the learning of Science, of which is to design the syllabus and Learning Implementation Plan (RPP). Where the results of interviews and observations of documentation designed lesson plans teachers indicate that teachers have planned use of authentic assessment at the beginning of the new school year with a syllabus and lesson plans prepared by reviewing the indicators which are suitable for various types and patern authentic assessment, teachers have also developed principles authentic assessment is applied to the openness between teachers and students, and of course authentic assessment has been applied in accordance with the standards of core competencies, basic competencies and indicators of achievement of learning outcomes. From planning is also seen that the teacher has communicated to the use of authentic assessment at the beginning of the semester and also describes the material as well as a graded assignment with authentic assessment that looks at the beginning of the lesson plan activities that have been designed, teachers also have determined the type of bills to be collected and also provides a map as storage tasks that have students collect, at the planning stage teachers also have a selection procedure determines the type and level of assessment that students collect and also have determined that assessment criteria set out in the form of the assessment format is also called the assessment rubric, but the assessment rubrics designed teachers still general not in accordance with the use of authentic assessment indicators.

Based on observations at the preparation stage it appears that teachers in core school and the impact has been identified learning objectives will be assessed with an authentic assessment that can be seen in the early stages of learning. In the preparation

phase is also seen that the teacher has communicated to the implementation of authentic assessment to students and explain the types of tasks that will be used in authentic assessment. The next process looks teacher explains the assessment criteria will be used to assess the students, but the results of observations in the two school teachers explain the impact is not visible to the student assessment criteria. During the implementation phase the teacher is able to distinguish the authentic look assessment individually and as a group, the teacher also has been discussed regularly authentic assessment tasks that must be gathered students and motivate students to produce authentic assessment better. Teachers also have determined sessmen selection process, but teachers do not routinely help students select a task that has been collected, and the teachers do not use authentic assessment in all material science to be learned. Crucial stages of the implementation of authentic assessment is the process of assessment, which is based on the observation shows that the teachers in the core schools have designed assessment instruments well, but the criteria are designed still common. The results of observations on the impact of school looks guru teacher still difficulty in designing an authentic instrument asesmen specifically, especially teachers are still difficulties in designing a special assessment rubric in accordance with the characteristics of science learning.

In the process of learning a very important role of the teacher, the teacher must be able to develop its creativity so that students do not feel bored with the existing learning systems. One of them by developing a scoring system that is the use of authentic assessment to motivate students to produce better work is to implement an authentic assessment of learning, especially learning of Science. Application of authentic assessment in the learning process requires good planning. Therefore, before applying the authentic assessment of the student, the teacher must have an understanding of the basic concepts of authentic asesmen. Base on interviews with teachers revealed that teachers understand the basic concept of authentic assessment. Teachers comprehension authentic assessment as assessment of the work product in use teacher has identified that the use of authentic assessment not only as one of the assessment instruments used to measure students' cognitive abilities but also can monitor the progress of learners as a whole. Assessment application process can work well if the teacher has a good understanding of conceptually related to authentic assessment. Brookhart (2010) suggests that there are

several steps that must be understood teachers in implementing authentic assessment include: determining the goal of authentic assessment, determine the content of authentic assessment, determine the assessment criteria, specify the format of assessment, their observations and authentic assessment, selecting evidence, set methods for estimating and reporting the position of learners in map capability. In the process of implementing authentic assessment takes good planning. The planning process can be done by the teacher at the beginning of each school year to prepare a device such as the syllabus and assessment systems, lesson plan (RPP), It can be seen from the draft that has been prepared teachers. Where from research data visible comprehension teachers have the basic principles of authentic assessment when will design lesson plans, teachers also have identified learning objectives that will use authentic assessment, explaining the use of assessment and the types of tasks that must be collected to students, from the planning stages is also seen teachers has designed a rubric assessment criteria which form the overall assessment.

Once teachers understand conceptually authentic assessment, teachers have better planning in designing the syllabus, lesson plans, and assessment instruments that will be used to implement an authentic assessment in science learning in particular. Word (2000) opinion that the use of authentic assessment can be directional, it takes six step plan, which was to determine the focus of authentic assessment, determine the content aspect assessed, determine the structure of authentic assessment, determine the use of authentic assessment, determine authentic assessment method and determine the use of rubrics. But this time the teacher is still difficulty in designing assessment criteria specifically, this was due to lack of time to prepare authentic design and amount of material that must be completed in one semester learning. When will plan the use of authentic assessment, teachers should have designed a special assessment criteria. As Gronlund statement (1994) that the assessment criteria that will be used in an authentic assessment can be immediately made to ensure that the content will be inserted into authentic assessment has actually contains evidence that is expected in the indicators of achievement of learning outcomes and all will depend on the characteristics of the basic competencies which have been determined and how the assessment will be conducted. In the implementation of authentic-based learning, teachers have been involved students from the beginning of the use of authentic assessment mainly in determining

the content should also be able to apply authentic collected. Teacher assessment involving students in determining the criteria for assessment of the instrument and also help students choose an assessment tool that should be incorporated into in learning. One of the success of teachers in the learning process is when the teacher is able to develop the cognitive, affective, and psychomotor students well. The existence of authentic assessment get make students more creative and independent learning.

#### 4. Conclusions and Recommendations

Based on the results of the analysis of teachers' understanding of the pattern of authentic assessment and benchmarking against authentic assessment found that the pattern of teacher assessment conducted science are more dominant on the test pattern in the form of multiple choice and essay. Also obtained information that the junior high science teachers generally have to understand the concept of authentic assessment, but the junior high school science teachers are still experiencing difficulties in implementing a comprehensive assessment authentic. Teachers have been able to identify the intended use of authentic assessment, understanding the content of the authentic asesmenyang be applied to students and also have to understand the evidence of selection procedures, has set focus and understand the position of authentic assessment assessment science learning. But the teachers still do not understand in determining the assessment criteria and report forms should from authentic assessment that allows teachers to monitor student progress.

Based on the analysis of the planning portfolio that has been conducted by researchers that through interviews with teachers, found that of the seven indicators to be disclosed only four indicators that have been conceived and developed with a good teacher. Where in the planning process authentic assessment indicate that teachers are able to identify learning objectives will be assessed by an authentic assessment, teachers have also been able to communicate using assessment to authentic look of the design students who had teachers prepare lesson plans, teachers also have determined the type of evidence and procedure to select evidence that students collect. However, teachers have difficulty in designing the assessment criteria, assessment sheet format and authentic assessment rubric. Based on observations made to look authentic assessment that implementation has been made to the junior high science teacher in West Java, it is seen that

the process of implementation of the authentic core assessment at school better than at school impact, which looks authentic teacher preparation before applying the assessment, in practice also seen teachers have implemented principle the principle of good assessment with authentic, where teachers engage students in discussing the type of evidence that must be collected, and also have established assessment focus both individuals and groups, but in school-induced less authentic assessment in order to conceptual understanding, which saw the percentage of the use of authentic assessment for subjects science less compared with other assessments, in addition to the current teachers have not had the column and specific assessment criteria for the assessment of authentic assessment.

To be able to perform better learning, teachers are expected to be able to design and develop learning tools with existing systematics especially in developing authentic assessment scoring system in particular, which can be obtained from various sources which relevan. For particular school principals can review the implementation of the evaluation process and monitoring the performance of teachers in preparing the particular learning assessment system in accordance with the applicable curriculum. In order for the quality of education, especially education in junior high can be better, it is expected that the relevant parties (stakeholders) can give attention to teachers in an effort to improve the ability of educators to prepare lesson plans and assessment tools, implement and evaluate learning, by providing training.

#### 5. Acknowledgements

Researchers would like to thank all parties who have supported to implementation this research activities in the context of lesson study activities in West Java. The author would like to thank all parties in particular to the Indonesia University of Education, West Java Provincial Education Department, and the Ministry of Education and Culture of the Republic of Indonesia, WALS and the schools and the teachers who have participated actively in the activities of lesson study.

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## Improving Self-Help Reading through Peer Review

(A Lesson Study at English Department of Teacher Training and Education Faculty of UMP)

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**Abstract:**

A self-help reading is ideally the learning goal of reading classes which should then be applied in the future lives. Earlier, the students' self-help reading was still considered quite low as they all depended much on external helps rather than on their own innate skills. This could be the result of several factors. The teaching and learning strategies implemented were still much focused on the teacher centered. The reading activities did not focus on developing reading life skills. Therefore, the goal of the lesson study was to improve the students' self-help in reading. Implementing the goal, two main focuses were done; first by improving the teaching and learning reading strategies and second by implementing peer-review. The method of research was an action research with 4 cycles and each cycle consisted of *plan, do, see* and *reflection*. This lesson study lasted for 3 months with 32 semester 3 students of class A of English Education Department in Academic year 2013/2014. The method of collecting data used was through tests and observations. The data were analyzed using descriptive qualitative analysis. Through reflections, the activities in reading classes which did not really help develop the students' comprehension should then be excluded. Those activities covered reading aloud, Indonesian translation and extensive grammar discussions. The research finding showed that (1) the students' self-help reading improved well viewed from their reading commitment and activities, (2) their reading comprehension improved viewed from their test results, and (3) the students' participation in reading classes also developed viewed from their participation in reviewing their works, in making and giving responses.

**Key words:**

self-help reading, peer-review, lesson study, comprehension, reading life skills

## 1. INTRODUCTION

Self-help learning is a great demand which has to be applied in a university study to achieve life skill learning. This is well understood as the students are already considered in their perfect maturity level. Therefore, their study is understood as their own responsibility. They have to study their lectures independently without depending on other people. They need to have their own attitude which supports themselves in achieving their successful goals in learning. As quoted from Sukarman Purba (1992: 16), self-help learning is obviously visible from the students' efforts in making themselves aware of doing their own goals and gaining them. They then pursue the goals by implementing orderly practices, disciplinary in learning, focusing on the learning materials and having good and tactical strategies in achieving the goals. They also need to have realistic ideas or thought and high responsibility. Thus, self-help learning is then understood as an important factor to pursue successful learning achievements.

However, self-help learning is still considered a problem in high learning in our country due to several reasons. First, most students are still dependant on their lecturers as their only resources in getting information. Therefore, they always tend to always come, wait for the lecturers and get ready to have learning materials from their lecturers. This attitude happens as they have already developed the habit of depending on their teachers as the center of their learning when they were at high schools. Second, quite often more lectures do not require students to think critically, work disciplinarily and independently at classes to use their time to learn the learning materials. These are the situations which could not facilitate them to get self-help learning in their lives.

The case also happens in reading activities in most high learning institutions. Most students do not develop yet the habit of independent reading. They seem to have felt that they do not need reading for their future investment. They might think that reading is just the burden they have in their study. When they read, they mostly do reading as they are assigned to do so by their lecturers. Therefore, when they read a text, they mostly find themselves lots of problems in comprehending the texts. They have problems in understanding difficult words. They do not have good strategy how to deal with the new words which should later then help them understand the message of the whole text they are reading.

Reading Class A is not another different class. Most of the students in this class also developed reluctant feeling of independent reading. More students developed comprehension skills depending on their lecturers, they did not feel

encouraged to venture reading for their own information enrichment. In another word, they had not developed yet high disciplinary reading to get as much information as possible as this was clearly visible in their reading activities in the classroom. Such situation was proved when they had shown little criticism during the class activities when they had some problems given by their friends or even by the lecturers. The fact that they had got less confidence in expressing ideas, criticism and perhaps suggestion only showed that they had not developed yet self-help reading. The more the students developed themselves self-help reading, the more confident and understanding the students had on their reading.

The students' less confidence and ability in expressing ideas, criticism and suggestion related to reading classes could be the result of learning strategy being designed and implemented by the lecturer. Less self-help reading employed by the students did not directly come out from the students' side. The lecturer had also developed the role in also making such an unexpected thing to happen. Classroom learning strategies being applied in the class would also contribute to the failure and success of the students' reading activities in developing self-help reading.

Referring to that problem, the solution which could be applied to develop students' self-help reading in Reading 3 was through *lesson study*. *Lesson study* which was meant to learn and apply classroom learning through collaborative work was considered appropriate to solve the reading problems. By designing good lesson plans collaboratively, assessing the teaching and learning procedure collaboratively and also solving problems happening to the classroom learning together, hopefully, effective classroom learning would then yield out.

Within this *lesson study* context, *peer review* and graphic organizers would then be applied to develop students' self-help learning reading. By applying peer review and graphic organizers, students were not only expected to develop independent reading as the short term goal, but they would also be expected to develop their self-help learning in common which they certainly used later in all aspects of life as their life skill for their future later.

## 2. FORMULATING LEARNING GOALS

The lesson study team consisted of 4 instructors, (Listiani as the model instructor, Pudiyono, Dyah Kusumastuti and Suwartono as observers), from English Education Department in



which two of them were considered as junior instructors having less than 5 years teaching experience, while the other two were considered to have the teaching experience of more than 10 years teaching time. The instructors began by selecting a reading course aiming at developing self-help reading, available reading texts or topics and the soft skill goals for students' learning based on the current syllabus. The instructors then selected the topic of interests to the students, usually the topic that was considerably important in building students' reading skills or one that posed problems for students in developing their reading interest and fluency.

Basically, the reading lesson focused on immediate academic reading goals related from qualities of character, dispositions and sensibilities such as curiosity, independent and critical thinking, tolerance of individual differences understanding specific concepts and subject matter to that of broad goals for development of intellectual abilities, habits of mind and personal qualities and specifically to those dealing with reading life skills.

### 3. LESSON STUDY METHOD

This lesson study was accomplished in Reading 3 in the even semester of Academic Year 2013/2014. It took 6 months, and located at English Education Department of FKIP Muhammadiyah University of Purwokerto.

Research data consisted of: 1) self-help learning progress on reading classes through peer-review learning technique, 2) students' learning participations during reading instructions in the form of student to student or student to teacher interaction during the implementation of peer-review learning technique, 3) students' psychological feelings during and after the application of peer-review learning technique.

Data collecting techniques applied consisted of three different techniques. Observation was applied to get both the data on self-help learning progress on reading classes and the students' learning participations during reading instructions. While to get the data on the students' psychological feelings during their joining the reading classes with peer-review, questionnaire and informal interview were applied.

### 4. THE THREE STEPS

The lesson study cycle consisted of mainly three steps or phases: planning a lesson (Plan), observing student reactions to the lesson (Do), and then analyzing those reactions (See). With these

three steps, theoretically, a lesson study could be considered so simple to implement. But in real practice, these had developed into highly complex in their execution. In implementing these three steps, even though each of all instructors had been, to some extent, accustomed to developing collaboration in their own professional learning communities in almost any aspects, we still found to have complex and sometimes surprising problems which could go beyond our earlier knowledge. Lesson study had offered us lots and various dimensions. Sometimes it could be risky to share multiple and various points of view that could have been the sources of disagreements among instructors, such as on reading class strategy, contextual solutions on reading problems and the students' academic attitudes, etc. By and large, these types of academic challenges could be handled well during the implementation of the three steps in lesson study and this had certainly developed a great deal of knowledge about building a team and a learning community in professional atmospheres.

#### 4. 1 Step One: Planning or Designing the Lesson (Plan)

The team of instructors designed a lesson which was intended to bring the goals of reading to become their life skills (Lewis, 2000). Therefore, in creating a good and appropriate lesson the instructors had to design and modify an existing lesson or start a new one. Newly hired instructors, who might be unfamiliar with the materials being designed, explored and shared the materials based on their own previous experiences in their teaching the topic, and discussed possible ways to address the lesson goals profoundly. Experienced instructors then responded to their possible understanding and procedures of the lesson. As it was considered a research lesson which was much different from everyday class preparation, the degree for instructors to collaborate should be appropriately extended in such a way to guaranty the success in creating and achieving the lesson goals.

Moreover, as the team designed the instructional reading activities, they certainly considered how they would possibly help students achieve their goals. More significantly and basically, instructors doing lesson study practiced cognitive understanding and activities to make student thinking visible. In planning a lesson, the instructors then predicted how students would be likely to respond to those specific texts, new vocabulary, questions which follow, possible problems and exercises on reading the text the instructors had already prepared. Certainly, the instructors had to put themselves in the position of a student and

imagined what it would be like to experience the material and lesson activities. Basically, this reading approach should foster the development of pedagogical content knowledge. As it was a lesson under the research, the lesson was designed in such a way in order to investigate student learning during the class period. As the instructors, we had to try to design a lesson that could make students’ thinking visible—that means, open to observation and analysis. Therefore, lesson study needed more time and greater depth of planning and discussion than typical class preparation. Instructor team should meet multiple times to plan a research lesson well. Research instruments should also be well designed to get enough and appropriate data needed to get the result of the research on the lesson study.

In this *plan* step, learning strategy was designed as the following: (1) deciding the learning materials and the research instruments; (2) asking students to analyze the learning materials given based on the texts which had been distributed for each group; (3) telling students to grasp the message of the text by making graphic organizers through peer-reviewing their work; (4) presenting the group work’s result to class; (5) confirming the correct result in class presentation.

To guarantee the steps to run well, the model instructor felt necessary to make the reading class procedure well understood by making posters exposed first in front of the class. As it was considered a crucial step, the model instructor explained the procedure clearly by making use of the poster. But before the instructor explained the procedure, she asked one or two students to read well and explain it to the whole class. Overall, it took more time for the instructors to get into the right frame of mind for planning the lesson. Frankly, we also had a recommendation on using an already-prepared lesson so the teams could spend more time focused on the observations and analysis. The team had to reach consensus on what actions the instructors would take to administer the lesson. Next, the team had to determine the intended student behavior for each action, meaning what behaviors the observers would see in the students as a result of the model instructor’s actions.

The team of instructors also developed a plan to investigate how students learn new vocabulary from the reading text. The plan certainly specified the type of observable evidence the team collected and how observers would observe and record data during the lesson. Later on, team of observers gave feedbacks on how to deal with the new vocabulary found in the text as students had tried to solve them by using their dictionary. As we know that dictionary help should be considered as the final help in reading.

Planning the lesson study also means with planning how to deal scientific activities on the lesson. As the team designed the lesson they also discussed what types of data they would collect as evidence of student learning and thinking. Therefore, the team designed several exercises in which students explained key words for clues in understanding the words. By this, it was quite obvious on the students’ participation in executing problems of vocabulary. During the lesson, observers attended to how students explained those new words in the reading material and also observed students’ written explanations for later analysis. More importantly, observers paid much attention on the students’ activeness in proving their reading comprehension of the text.

As this lesson study was not intended to determine the lesson’s effectiveness, nor what students learn, this lesson study much focused more on the way students learn from the lesson. To investigate the way students learned, therefore, the teams focused more on student thinking during the lesson; how they made sense of the material, what kinds of difficulties they encountered, how they answered questions, how their thinking changed during the lesson and so forth. To give help in data collection, the team of this lesson study prepared observation guidelines that described the lesson and indicated what kinds of data to collect. Data typically consisted of detailed observations of student activity and written work during the reading lesson.

#### **4. 2 Step Two: Teaching and Observing the Lesson (Do)**

In the step *do*, the model instructor applied self help reading strategy which was meant to improve the students’ self-help reading. The progress on the students’ self help reading in Reading 3 showed clearly during the time the students was doing peer-reviews. Socially, peer review improved students’ ability in building cooperative work with their friends. This cooperative work was quite visible when students were doing discussions both within the groups and among the groups inside the classroom.

Referring to the well carefully designed lesson; possible reading responses, potential reading difficulties, students’ potential speaking activities and model instructor interventions were planned in great details. The teams of instructors moved on to the way how to conducting the lesson. Observing student reactions was the point where lesson study proceeded; from typical uses of instructor observation. Instead of focusing solely on the actions of the instructor, observers collected data on behaviors or objectives identified in the planning

process. It was important for instructors who were observing students during this phase not to interact with students. Sometimes, we learned that when model instructor observed their colleagues, asking students questions about their lessons or about the model instructor would then bother the observation process.

Before doing presentation, students discussed in small groups the materials which they would present in the plenary class. The subjects that students discussed covered the following; new vocabulary, reference, mind map comprehension and a précis making based on the *guided questions*. Students then discussed at length in their small groups those subjects and made them ready to do the presentation.

After every group had already finished their small group assignments, the presentation time began in which each group had to make the presentation. In turns, each group presented their work in such a way as to show their understanding of the text based on the components having been discussed in their small groups. Within this step, students applied peer review phase one in which peer review was done among the members of the small group. The small group could share; work together, in order to get correct comprehension of the reading on their own understanding.

In the presentation phase, groups of students presented their discussion results dealing with comprehension exercises on the text message, language features, and other important information taken from the text. The text had been decided earlier taken from a text book or other sources the instructor had provided. The presentation was followed by a question and answer session to let students develop their comments, disagreements, feedbacks and arguments based on their reading comprehension.

The question and answer session considered also as peer review activities and accomplished before feedback session was done after students in their own understanding analyzed and identified the presenting groups' mistakes and unacceptable results on their way to understand the reading text pertaining on the message and also language components. The presenting group had to listen carefully to the correction and arguments given and had to be ready to refuse or accept their arguments in order to make their small group work better.

After the presentation was over, members from other groups were encouraged to give comments, corrections and feedbacks based on their understanding to get better comprehension and make the presenting group' assignments better. This was considered the real forms of peer review activities of phase two applied among small groups.

The activities done during peer review expressed their forms of reading text comprehension which were implemented into their agreements or disagreements referring to what the group had done or presented. Both agreements and disagreements toward the group results were ideally followed by logical arguments. Through this logical argument then the students' maturity in understanding concepts and ideas offered from the text would then develop better. But logical arguments were not enough for the students to get complete disclosure of ideas. Therefore, the need to get solution or alternative of the problems being discussed was considered primary important.

Students who had got good agreement or disagreement completed with appropriate solution would therefore get perfect appreciation both from the instructor and other students. Besides giving arguments, members of other groups could also express their response through suggestions or recommendations. When the class had no more arguments or responses from the other groups, the presenting group could then conclude their presentation.

During this activity, the model instructor should manage the activities which were going on to make sure that the peer review activities could develop as planned. Other instructors observed critically to what activities the class was proceeding. They could take a minute to all activities happening to both the students and the model instructor. They should also make sure that there would be no activities without being noticed under their observation.

The lesson was taught at the normal scheduled time during the term without any adjustments prior to the observers' sake. One member of the team, the model instructor, taught the lesson and other members attended the class to observe to collect data. Teams could also invite guest observers (e.g., departmental or professional colleagues, graduate students) when necessary. Instead of observing how the model instructor taught solely, as in typical classroom observations, observers focused on how students responded to the lesson. This was certainly designed by the team earlier rather than by the model instructor who was scheduled to teach.

Observers gathered as much evidence as possible related to the learning goal during the lesson, capturing the dynamism of actual teaching and learning processes. Depending upon the team's data collection strategy, observers could record detailed field notes, focus on specific types of student activity, or use checklists or rubrics to categorize or monitor student engagement, performance, thinking, and/or behavior which were visible in the classroom participations. They could

observe the entire class or focus on specific students during the lesson. Students were guaranteed to have no learning interference during the activities of the learning process. Instructors explained the reason for observation and other related activities and how the data would be used to improve the lesson.

First observation got a good finding showing that not all students paid attention to the presentation. Therefore, only few students were ready to propose feedbacks and suggestions towards the result of the presentation. This all could stem from the possible problems for students in understanding the text being presented. Consequently, the feedbacks came from the model instructor by telling that students should focus on the difficult words as the new entry for students to learn, the new phrasal expressions which they thought difficult to understand. The model instructor also underlined that students giving feedback would take more points as their extra advantage.

Second observation got a finding that exposed students' problems in understanding unfamiliar words. They still had their own belief that the problem of a difficult word could be solved by looking up the word in a dictionary. This belief was not completely correct as a dictionary usually offered many lexical meanings students had to choose. Practically, students had to learn the word in context to get the correct meaning by making logical and analytical guesses. By applying this, students would then be able to develop their self help comprehension on new vocabulary which should not depend much on their dictionary. In turns, hopefully students could find some pleasure in reading a text.

Third observation found a finding that students still found it difficult to get the main ideas of the text. Therefore, students were not able to design a correct mind map of their understanding or comprehension of the reading text. To solve this problem, the model instructor always gave necessary correction to the comprehension map made by the presenting group to get the confirmation of the correct comprehension map. By this, hopefully students could manage to develop their skill in making the comprehension map. Besides the fact that students were still in confusion in making a comprehension map, the medium of communication they applied in their discussion mostly was still in Bahasa Indonesia. This could perhaps be understood citing that they would not take the risk of having double problems in implementing the activities; communication and comprehension barriers. Some surprising phenomena came out during the third observation, the class procedure applied translation activities as well in their process. Related to real life skills, such a thing never happened to people reading a text by translating it into another language. The correct stance toward this activity was to recommend

them to minimize translation bit by bit and finally to stop it for good.

#### **4. 3 Step Three: Analyze the Data and Discuss the Lesson (See)**

After having observed the lesson, particularly on the students' participations, each member of team met for a debriefing or exploring meeting where the teams analyzed the students' reactions to each part of the lesson they had just joined. More than just looking at what parts of the lesson didn't give any effects to students; the instructor team also analyzed what parts of the lessons worked for students well and why. This in-depth analysis helped the instructors understand how the students made sense of the materials and what each student's reactions revealed about during the lesson. During this phase, the goal was to help model instructor think about her own instruction and her students' thinking in a different way. In trying to know "the success and failure" of the class instruction, the following questions could be considered; Are students really engaged into the lesson? In what parts of the lesson are they engaged? In what way are they engaged? In what way do we know that they are engaged?

The observation result showed that during small group discussions all group members seriously worked hard to implement the assignments as recommended. They worked in their teams to finish their assignment on time. It was also obvious from this event that the strong academic students also helped the weak ones in trying to understand the text being discussed. This happened clearly when some students did not understand the words unfamiliar to them; the strong academic students offered some help to make them comprehend. When they had to make the mind map based on the text understanding, each team showed quite intense group work. In making the comprehension map, some students in the team were captured showing their ideas into some scratches of the map.

The observation result on the small group presentations showed that most students presenting the group assignment presented their work based on their written work or they presented textbookly. They could not yet present their results by producing their language utterances orally. Mostly, they presented their work by reading the précis or the text summary. Ideally they should present their work by using their comprehension map as their media presentation.

A variety of approaches could also be applied to analyze the student observations. Time mapping was also applied in which this measured how much time the model instructor or students spent talking, doing an exercise, waiting for next

turns. During small group presentations, what the model instructor did was not considered to have dominated the meeting as she observed every presentation and discussion profoundly. Therefore, the time mapping in the learning procedure was still considered timely. From this, it could also give clear picture that the model instructor considered the time of teaching to always rethink whether she dominated lessons or not.

Another observation result showed that the model instructor still applied translation techniques by asking students to translate the text parts by parts into Indonesian. This was probably meant to know and check whether students could understand the reading texts. This was certainly considered an unacceptable practice as in our daily life translation was not a common practice when reading texts. Besides, another result also emerged as she also sometimes used Bahasa Indonesia as a medium of her clarification or explanation.

A well prepared lesson study, of course, organized facilitation process and helped create a smooth and comfortable analysis. After the observations, the model instructor who taught the lesson would note her thoughts dealing with what ‘successes’ and ‘failures’ in implementing the lesson plan to get her ready to present in the debriefing. On the other hand, the observers wrote what they thought went well and what could change on certain notes. The observers then exposed this notes of comments somewhere on the board in the room to encourage everyone to see around the notes in the room reading before we began the discussion.

The team of instructors applied the agreed rules to proceed with the discussion. The model instructor talked first followed by team members. She then expressed her feelings and impressions after she had executed the lesson plan. We got the understanding that she did not feel as she wished as quite many students could not present their assignment in the correct reading comprehension and fluent and well presented grammar. Besides, the model instructor also noted that students still found it difficult to design the correct comprehension map based on the text. Such conclusion was quite visible on the students’ presentation as well as the students’ written evidences. Observers also shared their observations and exposed some necessary evidences from the lesson on the model instructor’s medium communication and also the application of translation activities. Such events and also other student written work could reveal important insights on teaching practice and student learning responses leading to some valuable learning reflections.

Following the data exposing or debriefing session, the team of lesson study held one or more meetings to organize and analyze the data further and discuss possible changes to the following lesson.

Based on the evidence, the team revised its approach by encouraging the model instructor to use less Indonesian, apply less Indonesian translation and encourage students more to design better and correct mind map. In addition to revising the lesson and the method for collecting data, some teams reconsidered their learning goals in light of the findings. Students’ activities which were mainly observable in this lesson study such as paper presentations, paper discussion and feed backing or peer reviewing sessions and also some other aspects such as the level of difficulty of the materials and exercises resulted information to the model instructor and observers to revise the learning strategy.

As the goal was to develop good reading habits in reference to their daily reading practice, the big learning advantage in this step or phase three came out to determine the implications to learn that students should not develop the habit of reading aloud for developing their reading comprehension. Therefore, the main goal of reading was mainly for comprehension. Activities which did not really develop comprehension building should then be excluded from reading learning processes.

## 5. FINAL RESULTS

Lesson study would certainly give good result to both the instructors and students concerned. Both were expected to make significant changes on their willingness to adopt some learning in the class interactions on the pedagogical attitudes. The instructors hopefully got transferable skills in handling classroom interactions on the subject they would teach. They would walk away and say that they had got a more efficient way of doing something. The students also got better learning strategy in developing their language skills.

Through the activities applied in *peer review*, students were led to develop their ability to analyze their reading comprehension well by comparing the reading comprehension of other group members. Besides, they should also develop their ability to identify other member’s possible mistakes in deducing meaning from the reading context. Trough this peer review, students were also encouraged to develop their courage and skill in offering some suggestion or feedback towards the ideas and comprehension of the presenting groups.

On the other hand, through these activities, the students were also encouraged and trained to develop their patience and tolerance in taking ideas offered by other groups to make their job perfect. Making their job better by listening ideas from other groups was not easy and, therefore, this needed lots of practices. This also means that they needed

discussion and arguments in order to come to the desired conclusion.

Another benefit taken from this peer review was that students were motivated to read more to develop their reading skills and to broaden their life understandings in order to be ready to participate in the group discussions. Some students who could not get themselves involved in the discussion or debates might have felt that they were much left behind from others. Therefore, they felt they needed more knowledge to participate well in the class discussions. This activity consequently made the students develop their reading habit bit by bit by running reading activities of their own independently as their effort to increase their reading experience to comprehend texts.

In the presentation step, the presenting group presented their group discussion results which were related to their effort in understanding the reading text they had to digest. In this step, students had to give their solution to the reading problems commonly happened in reading, covering new vocabulary entries, understanding main ideas and the text message by designing the comprehension map. In designing the comprehension map, what students did was still considered less complete as they only designed the main ideas only on the map. This means that they still left the supporting details on the map which in turns made them unable to do the presentation well. Ideally, presentation should then be based on the comprehension map they had already designed. Therefore, the map should provide enough information related much to the title.

Besides that, students had to develop their language productivity by expressing their text understanding on their own English. Sadly, some students still found it hard to create their own English sentences to express their text understanding. Some took the best advantage of a computer feature just by copy pasting the expressions, sentences they thought to have born representing the comprehension of the text message. Fortunately, such this practice was certainly spotted by other students and observers during presentation which then led them to reprimand students to cease doing such practice. In common, most students took much progress both in their reading skill and language productivity and also their soft skill developments, such as creativities and critical thinking.

## 6. CONCLUSION

1. Learning reading through *peer review* was concluded to be effective in developing student's self help reading. This was meant that in every step of learning students were

led to develop their independency and to depend on neither their classmate nor their model teacher. The students fully worked hard to develop their understanding of the text they read fully exploring their own capability towards the assignment given.

2. Anyhow, peer review also developed students' critical thinking towards text comprehension by commenting the job their peer had already done through feedbacks addressed on their friends and other groups. Without having any critical thinking, students would not be able to lend any helpful recommendations.

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## Increasing Students Sensitivity Toward Environmental Problems And It's Implementation To Building Research Proposal Trought Project Based Learning (Pjbl)

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**Abstract:** Professional competence is characterized by mastering teaching materials, conduct educational learning and able to do research. Environmental science course equips students to be able to increase the sensitivity to environmental issues and use them to formulate a research plan based environment. Problems were found in the lecture during this extremely sensitive to environmental issues and the ability to use the research to develop an environment that is still low. Though sensitivity to environmental issues is the entrypoint to piled plan-based research environment. The purpose of writing this paper is to describe the implementation of the *Project Based Learning* results in increased sensitivity to environmental issues and apply them to plan research on the biology of the prodi student education semester V. It has been applied to Project Based Learning on knowledge of the environment in the course semester in 2013/2014. Its activities include *the determination of the issues and groups, formulation of how to solve problems, conduct field investigations, organize and analyze the data, present the results and evaluation*. This activity takes place within 4 (four) cycles. In the determination of Plan, the teacher makes the lesson plan (RPP) personally, than discussed together with the lecturers. In this activity students carry out the learning process DO and observed by several lecturers. See on activities, do reflect on the learning that has been carried out led by a moderator. Data on students' learning activity findings after analysis showed that there is an increased sensitivity to the problems of the environment and student ability to piled plan research for lectures from cycle to cycle. With PJBL They conditioned to learn sincerely and responsible. It can be concluded that the PJBL can increase student sensitivity to environmental concerns and PJBL can improve the ability to plan-based research environment.

**Keywords:** *Sensitivity, the environment problem, research plan, Project Based Learning*

## 1. INTRODUCTION

Throughout human exploration of the environment takes place naturally, then the carrying capacity of the environment will be better, and the relationship among them will happen naturally, it is. But because humans have changed the level of need (basic) to desire (tertiary), the human exploration of the environment becomes greedy and greedy. Drained environment as closely as possible to satisfy the growing number of human beings. Beginning this moment, then there is an imbalance (disequilibrium) the relationship between man and his environment. Changes in the pattern of human relationships and the environment is the beginning of the emergence of environmental problems and result in the occurrence of a disaster (hazards) environment. Man in the running life of the role and consequences on environmental issues.

Sensitivity is the response speed (fast response) someone to everything in their environment. Sensitivity to environmental issues is the awareness of the environmental issues that arise as a result of the imbalance ecological relationship between biotic and abiotic factors. These problems are very diverse and attract attention to get to review and potentially as an input in preparing the study. Sensitivity is the degree of awareness and response to environmental changes. While sensitivity to environmental issues is the degree susceptible to the changes that may lead to damage or harm the environment. Sensitivity to environmental problems can be identified through the ability to detect potential problems or that appear in the environment. The number of potential problems that have arisen or are able to realize or indicate the degree kepaakaan someone responds to environmental problems. In lesson study, there are two aspects of the students' sensitivity and awareness that the response observed in the scale of quantity and quality.

Based on the results of preliminary observations indicate that student sensitivity to environmental issues is not optimal. Most students do not have awareness of the potential for environmental problems. They have a new awareness of the problems that have arisen as a result of the various changes that have preceded it. And to be able to become a researcher must have a sensitivity to the phenomenon that may occur or be potential. Increased sensitivity to environmental issues is possible realized with the implementation of lesson study in environmental

science lectures were conducted by the method of Project Based Learning.

Environmental Science course is one of the courses that support the achievement of the goals of biology study program. Subjects that have the competency standards and eight (8) basic competence is the reference targets. Applying the standard of competence, namely the principles of learning strategies in biology teaching and research-based learning strategies. Competence is essentially the first Mastering the environmental knowledge and sensitivity to environmental issues and applying environmental problems in knowledge-based research proposal peyusunan environment, with indicators as follows: 1. To describe the basic concepts of environmental science, 2. Analyze the environmental problems in Indonesia, 3. Describe Environmental Law, Energy Conservation 4., 5. Menganalisis of the population, 6. Menganalisis succession and land degradation, 7. Menganalisis characteristics of natural resources, the availability, utilization and permasalahannya on humans, 8. Evaluate pest control, 9. Analyze pollution and its effects , 10. Analyzing global warming. Indicators developed on the basis of each competency can be seen in Table 1.

Learning outcomes will be more meaningful if at the time of study followed by attitude and strong motivation, learning in earnest and responsible. In order for the attitude, motivation, learning seriousness and responsibility can be maintained then the learning climate should lead in creating. Lesson Study (LS) is a model of coaching (training) professional educators through collaborative learning and assessment ongoing collegiality based on the principles of mutual aid and mutual learning to build a learning community. Lesson study implementation phase includes planning (plan), implementation (do) and reflection (see). Activity lesson study conducted by a group of lecturers. Lesson study can also be taught to the students as prospective teachers, because basically the lesson study is done on a regular basis and in order to improve the competence and professionalism of teachers gradually.

Lesson study in the learning activity, other than as an attempt to enable students, faculty can also have an impact on conducting a review of its performance. Through lesson study with the Plan, Do, See, enabling the development of academic skills of students who earnestly and cultivate an attitude more careful and responsible in learning because of the lesson study will be observed and reflected either by the student or by the faculty observer observer. Based on these insights, the students need to know the sensitivity to environmental problems and take advantage of



the preparation of research proposal. Thus, the purpose of writing this paper is to describe the results of implementation of lesson study in sensitizing students to the problems of the education department of the environment VI semester biology and apply these issues into the preparation of a research proposal.

## 2. METODE

To achieve the expected goals of improving student sensitivity to environmental issues and implementation issues as input in preparing the research proposal study conducted by the Lesson Study with three stages of plan, do and see. The three stages are implemented in four (4) times the cycle of lectures LS. Sensitivity students in environmental issues and the application in the preparation of this research proposal is the focus in the implementation of a managed learning environment knowledge through Lesson Study in Project Based Learning teaching methods (PPA).

To obtain empirical evidence of the focus of the study, the subjects were studied as a source of data is the faculty and students are involved in LS for Environmental Science course. Lecturers involved are Drs. Nurwidodo, Kes., Dra. Atiq Himmah, MPd., Drs. Joni Hidayat, MSi., Drs. Husamah, MPd., Dra. Iin Hind, Kes., And DR. Poncojari Wahyono, Kes. Lesson study in Environmental Science course is designed in 4 cycles or rounds. Each round is conducted in three stages: (1) planning (plan) in preparing the teaching plan and teaching materials, (2) conduct lectures based SAP has been prepared (do) and was observed by the Lesson Study team members and other observers, as well as (3) a discussion of reflection based on the observation (see).

At the stage plan, a comprehensive assessment is shared equally to teaching plans and teaching materials that have been planned which include course syllabus, the material to be taught, faculty role models that will, sheet kePjBLatan students and evaluation instruments are required. The assessment results are used for necessary improvements to the design of structured learning.

At the stage of implementation (do) lecturer implementing learning models according to the lesson plans that have been getting together assessment and repair (revision) in accordance with the advice and input. Meanwhile, the subjects acted as an observer team (other than the lecturer models). In carrying out the implementation of learning observation, also invited lecturer for Environmental Science course outside the group to participate in the learning observations. Observations based on a standardized observation sheet that has been

prepared. Observations aimed towards students' learning activities during lectures both positive and negative. To strengthen the observation of documentation was created through photos and video recording (audio-visual). Documentation is made to the behavior and general or specific events during the learning process, and valuable as evidence Authentik events during reflection activities to reinforce learning.

Stages of Reflection (see). Reflection activities carried out immediately after completion of learning. This activity was followed by all observers and lecturers models and led by a moderator and assisted by a secretary. In this activity the discussion of the events that arise in learning both general and specific, positive or negative, but not to convict the lecturer models. Student learning activities are a major concern. Steps taken in this activity is the moderator introduced each audience who participated in the reflection of the role of each, then lecturer models are required to submit prior perceptions of the learning that took place recently. Next the entire observer requested to submit their observations in a sequence. After all observers submit comments, then the next step is a model lecturer asked to respond to comments by the observer. The spirit that is built to enhance the learning performance as the focus of a problem that has been planned, rather than on the search for a model lecturer weakness. The results of this reflection is then used to input for the preparation of the next lesson planning.

Techniques and instrumentation for data collection. The data collected includes data on (1) the sensitivity of students to environmental issues and (utilization issues to plan peelitian). For data on the sensitivity of the issue, mainly on two aspects: the number of environmental problems was realized and the student response to the problem. While the problem of data utilization to develop a research proposal based environment, the data collected includes 1. Ability to formulate research titles, 2. Ability to describe the background, 3. The ability to describe the formulation of the problem, and 4. The ability meumuskan research purposes.

In describing the lecture, a data analysis technique using content analysis results of observations on the activities undertaken do and see. In the content analysis was then carried out the collection of information, reduction, verification and conclusion. To describe the increased sensitivity and the ability to utilize the remedy problems digunakan research plan descriptive data analysis.

## 3. RESULTS AND DISCUSSION

Description of the implementation plan, do and see for every material used in the open lesson

### 3.1 Plan

Lecturer models namely Drs. Nurwidodo Kes, learning tools used include syllabus, lesson plans (RPP), an outline of the lecture material, methods and media are required for implementation (do) the first cycle (material Succession and Adaptation). RPP is delivered openly one day prior to the implementation of the open class for feedback, criticism and suggestions from all the lecturers in the group Environmental Science course. In the discussion of this RPP, faculty input, and some models get a note for improvement. Such a move is made to the preparation and open discussion of the lesson plan for the second cycle (Pest Control), played by Drs. Nurwidodo, Kes., Cycle III (Environmental Pollution), played back by Drs. Nurwidodo Kes, and cycle IV (Global Warming) is also played by Drs. Nurwidodo, Kes. In preparing and doing the open discussion, the attention is also focused on student sensitivity to environmental issues and the application of these issues to develop a research proposal.



Foto 1. Plan session

### 3.2 Do (implementation)

Cycles (rounds) I lecturer implementing learning models (do) with competency standards and Adaptation analyze ecological succession and apply it to develop a research plan. Learning step is done by following the syntax of Project Based Learning, which asks students to form groups, then each group was asked to determine the issue of succession ekoloPjBL and adaptation, followed by field investigation activities. The results of field investigations discussed in the group, and do organizing the data squares to then presented and discussed in class with the other groups. Before the meeting ended, the lecturer asked the students to menPjBLmentasikan various issues related to succession planning and adaptation into

the theme-based research. It is addressed primarily to the title of the proposal, the background, the formulation of the problem, and the purpose peneitian.

In the second cycle models lecturer played by Drs. Johni Hidayat, M.Pd. Lecturer implementing learning models (do) the PPA method again. Basic competence is assessed eradication of pests. Steps to be taken in accordance with the procedures contained in goup of Investigation as the first cycle that determines the problems associated with pest management, field investigation related to pest control, to discuss the results of the investigation and then at the end of the meeting when the group was asked to present the results of their discussion. After the presentation, each group was asked to make a response to pest problems. They are also given the opportunity to respond to pest agreed to put forward the slogan of each group. After that proceed to the next task, namely the use of assessment penمبرantasan pest problems to develop a research proposal, primarily for titles, backgrounds, formulation of the problem and research objectives. Each member develops their own plan research proposal in question, then the discussion group to which the proposal memferivikasi of any member who most deserves to be a group proposal. Proposals were selected to represent the group then studied further to obtain endorsements associated with originality, a sense of urgency and perfection of the proposal preparation.

In the third cycle models lecturer in charge is the father of Drs. Nasrullah, MPd. Lecturer model of implementing the learning model PPA. Competence is developed environmental pollution. Lecture from the beginning to the end of follow syntax of Project Based Learning, which asks students to form groups, then each group was asked to define the problem of environmental pollution, followed by field investigation activities. The results of field investigations disiskusikan in groups, then presented and discussed in class with the other groups. utilization of environmental pollution problems to develop a research proposal, primarily for titles, backgrounds, formulation of the problem and research objectives. Each member develops their own plan research proposal in question, then the discussion group to which the proposal memferivikasi of any member who most deserves to be a group proposal. Proposals were selected to represent the group then studied further to obtain endorsements associated with originality, a sense of urgency and perfection of the proposal preparation. At the end of the meeting, the lecturer asked the students to prepare a model pembelajaran come.

While in the fourth cycle of the lecturer in charge of the model is Dra. Atiq Himmah, M.Pd. In this fourth cycle of basic competence is assessed students can understand global warming and exploit the global warming problem in the preparation of research proposals. The method used is Project Based Learning. Steps to be taken are as follows. which asks students to form groups, then each group was asked to define the problem of environmental pollution, followed by field investigation activities. The results of field investigations disiskusikan in groups, then presented and discussed in class with the other groups. Utilization of the global warming problem to develop a research proposal, primarily for the title, background, formulation of the problem and research objectives. Each member develops their own plan research proposal in question, then the discussion group to which the proposal memferivikasi of any member who most deserves to be a group proposal. Proposals were selected to represent the group then studied further to obtain endorsements associated with originality, a sense of urgency and perfection of the proposal preparation.



Foto 2. Do with observation by observer

### 3.3 See (Reflection)

Reflections on the cycle I, II, III and IV were held to discuss the learning process has been going on and work on improving the quality of the next cycle in accordance with the issues raised in the focus of the lesson study course for Environmental Science. The implementation process of reflection following the standard guidelines given by the Director General of Higher Education. Led by a moderator and assisted by the trial secretary. A professor or teacher first models were given the opportunity to express his perception during the learning process, then the observers are requested to submit observations and models lecturer asked to respond back to the comments made by the observer. In this reflection is discussed and reviewed on the achievement of learning as the focus in the implementation of lesson study on

environmental knowledge subjects. In a reflection of the first cycle, the level of student sensitivity to environmental issues and the ability to use the issue to develop a research proposal has yet to show the results as expected. Then the ability to plan based study that examined the problem of succession and adaptation are still not meet the standards that are expected. Karakteistik becomes the input for the next cycle of improvement.

In a reflection of the second cycle, the level of student sensitivity to environmental issues and the ability to exploit the issue to develop a research proposal continued to show the results as expected. Then the ability to plan based study also examined the issue meets the standards expected. Karakteistik becomes the input for the next cycle of improvement (III and IV).

### 4. Data Sensitivity Student and His discussion.

The sensitivity data obtained from the students in the first cycle when the lecture was held on 13 November 2013 (syntax 1 s / d 4) and dated 17 November 2013 (syntax 5 s / d 6). Basic competencies covered are analyzed succession and adaptation. The results of the sensitivity of identification of students showed that there were 14 students who are very high sensitivity, low sensitivity of 15 students and 10 students kepekaanya regular (medium). The results of the identification of the student's response to the problem of showing show that 14 people are very responsive, unresponsive 15 and 10 responsive..

Tabel 3. Sensitivity Siklus I

Tabel 4. . Capability to Write Proposal Siclus I

In the second cycle of learning for Environmental Science held on 17 November

Indicator of sensitivity	Frekuensi	Prosentase (%)
Numbers of problems identified	9	25
Relevance of problem	7	22
Respond to the problem	10	27
Relevance respond	15	30

2013 (syntax 1 s / d 4) and dated 25 November 2013 (syntax 5 s / d 6) to discuss the basic competence problems that arise as part of the

Indicator capability to write proposal	Frekuensi	Prosentase (%)
Writing Titel proposal	13	65
Writing Background	11	62
Writing problem formula	25	70
Writing aim of study	15	30

eradication of pests. Data on student sensitivity to the problem of pest control and the ability to develop a research proposal based pest control in the second cycle is increased as can be shown by the following table.

Tabel 5. Sensitivity Siklus II

Indikator kepekaan	Frekuensi	Prosentase (%)
Numbers of problems identified	13	25
Relevance of problem	11	22
Respond to the problem	10	15
Relevance respond	5	10

Tabel 6. . Capability to Write Proposal Siclus II

Indikator kemampuan menyusun proposal	Frekuensi	Prosentase (%)
Writing Titel proposal	15	68
Writing Background	15	65
Writing problem formula	27	74
Writing aim of study	19	33

In the third cycle Knowledge learning environment which was held on December 2, 2013 (syntax 1 s / d 4) and dated December 9, 2013 (syntax 5 s / d 6). Basic competencies covered are environmental pollutants. Data on student sensitivity to the problem of environmental pollution and the students' ability to take advantage of the environmental pollution problems for the preparation of a research proposal showing the results as in the table below.

Tabel 8. Sensitivity in Siclus III

Indikator kepekaan	Frekuensi	Prosentase (%)
Numbers of problems identified	20	20
Relevance of problem	15	15
Respond to the problem	15	15
Relevance respond	10	20

Tabel 9. Capability to Write Proposal Siclus III

While in the fourth cycle were held on December 28, 2013 (for syntax 1 s / d 4) and January 4, 2014 (for syntax 5 s / d 7) to discuss

the issue of global warming. Results of the sensitivity of the data collection of students to

Indikator kemampuan menyusun proposal	Frekuensi	Prosentase (%)
Writing Titel proposal	20	69
Writing Background	19	66
Writing problem formula	29	74
Writing aim of study	21	35

issues relating to global warming and the students' ability to exploit these issues to develop a research proposal are as follows:

Tabel 10. Sensitivity in Siclus IV

Indikator kepekaan	Frekuensi	Prosentase (%)
Numbers of problems identified	23	65
Relevance of problem	21	62
Respond to the problem	20	65
Relevance respond	15	30

Tabel 12. . Capability to Write Proposal Siclus IV

Indikator kemampuan menyusun proposal	Frekuensi	Prosentase (%)
Writing Titel proposal	25	68
Writing Background	25	65
Writing problem formula	31	74
Writing aim of study	26	69

From the tabulation of data collection and analysis suggests that sensitivity to environmental problems are indicated by the number of environmental issues were identified and the relevance of the issue with the theme being studied as well as the ability to use a problem-based research to develop a plan of environmental knowledge in environmental science lectures from the first cycle to cycle the second to the third cycle and the fourth cycle was increasing.

#### D. CONCLUSIONS

From the implementation of Project Based Learning in Environmental Science course in

Education Studies Program Biologi JPMIPA FTTE UMM can be summarized as follows:

1. Project Based Learning can sensitize students to environmental issues as the main input to formulate a research plan based on knowledge of the environment in order to prepare candidates for professional teachers.
2. Project Based Learning can improve students' ability to take advantage of the environmental issues to develop a research plan, as the demands of graduate education is to graduate biology that is ready to become a professional teacher.

#### E. ADVICE

1. In relation to the benefits to be gained from the implementation of Project Based Learning in the course of environmental knowledge then needs to be developed for the implementation of other scientific subjects.
2. The subjects beyond Environmental Sciences are strongly advised to apply the lesson study to occur simultaneously coaching profession and improving the quality of the process and results of the lecture can be felt soon spread and more benefits.

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## Lesson Study (LS) in Nicaragua

Gerardo Gracia

**Abstract:** The Ministry of Education of Nicaragua is introducing Lesson Study mainly for two reasons: To improve the courses of Mathematics and its Didactics in Teacher Training Schools at national level. To improve the approach of teaching of all subjects of primary education. The former corresponds to one of the four outputs of the Project for Improvement on Quality of Mathematics Teaching in Primary Education (PROMECEM) Phase 2 which is being implementing in Nicaragua with the Technical Cooperation of JICA. The latter is one of the objectives of the National Strategic Plan of Education (PEE) and the implementation of LS in this context is an immediate impact of the Project in elementary education. LS is becoming an specific process within these strategic actions of the PEE: (1) Development of Teachers' Inter-Training inside Clusters of Elementary Schools through the monthly Pedagogical Meetings, and (2) Implementation of the System of Teacher Training and Teachers' Knowledge Updating through the TEPCE (Monthly Meetings of Monitoring and Planning), Pedagogical Meetings and Teacher Training and Advising Networks. This introduction of LS itself, carry some challenges (intrinsic and extrinsic) in Teacher Training and in Teacher Practicing related to the three main steps of the LS process, Plan, Do and See.

**Keywords:** Lesson Study

### 1. SETTING THE CONTEXT

The National Strategic Plan of Education has within its central themes the Quality of education and in this theme has as one central concern Teacher Profession that has as objective "To improve teacher profession through programs of early teacher training, teacher practicing and educational research (...)". This objective implies 11 strategic actions, three of which refer to: teacher inter training through monthly Pedagogical Meetings based on schools' clusters, implementation of the System of Teacher Training and Teachers' Knowledge Updating through the TEPCE (Monthly Meetings of Monitoring and Planning), Pedagogical Meetings and Teacher Training and Advising Networks.

The actions mentioned before (Pedagogical Meetings and TEPCE) are related mainly to elaborate a list of contents that will be taught through a period of two months and to monitor and check the fulfillment of this plan, and on the other hand, to interchange (verbally) experiences related to the teaching of some contents. These two processes or actions lack of the research concern mentioned in the PEE and this lacking is the main reason (and an opportunity) of the introduction of LS in the Teacher Training Schools as well as in elementary schools.

### 2. IMPLEMENTATION OF LS IN NICARAGUA

Implementation of LS implies several activities that has two targets primary education and teacher training. Activities related to primary education arose as an impact of the activities of PROMECEM 2, and those related to teacher training are properly within the project concerns.

### 3. IMPLEMENTATION IN TEACHER TRAINING SCHOOLS

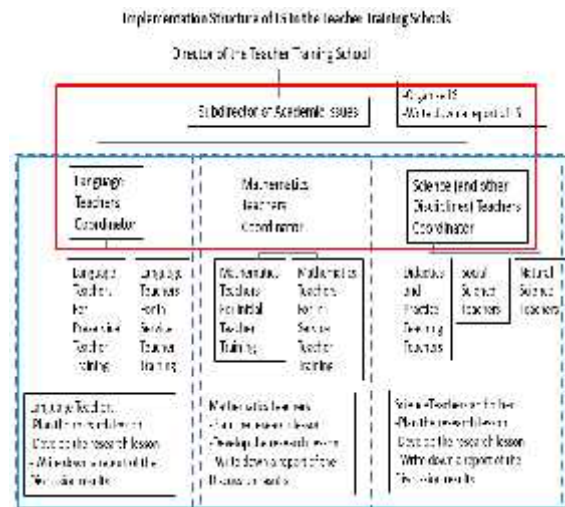
Nicaragua has 8 Teacher Training Schools located in the same number of departments. Teacher training takes three years (2.5 corresponding to in-school lessons and 0.5 corresponding to teaching practicing at elementary schools).

The introduction of LS in Teacher Training Schools began with the LS on the Course of Mathematics and its Didactics as an outcome of the implementation of PROMECEM 2. The project trained mathematics teachers and, currently, is giving advising on planning, open classes and

reflection. The main activities in this context are strongly linked to the following concerns:

- LS introduced as "Mathematics and its Didactics Lesson Study" with all its grades/each grade at least once a year.
- LS at schools is organized with the aid of the Project, in which teachers of other subjects, including students of different grades participate.
- Cluster based LS is organized and facilitated by teachers, in which in service teachers of primary schools and pedagogical advisers of the municipal offices of the ministry of education participate.
- These LS are monitored by the Project, the Schools themselves and, sometimes, by municipalities (email, phone callings and visits) and its cost of implementation is shared by the Project and the Schools.
- The opportunity to face and identify main teaching problems at a real situation (not a written or verbal one) and discuss and find possible solutions.

The structure of the implementation of LS in the Teacher Training Schools is as shown in the following diagram:



The coordination committee is enclosed by the red line (its members: Subdirector and the coordinators of each subject area) and the implementation committee is enclosed by the blue line (its members: the coordinators of each subject area and teachers of all disciplines). The groups enclosed by the dashed lines are the implementation committees of each subject area.

Actually, most of the activities of LS in Teacher Training Schools correspond to the mathematics teacher team and, as an effect, teachers of other

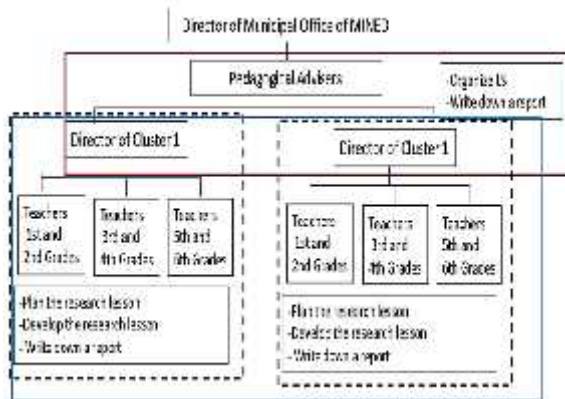
subjects are experimenting LS by their own initiative.

LS in Teacher Training Schools is monitored by PROMECEM 2 and, in some cases, by local pedagogical advisers.

#### 4. IMPLEMENTATION IN PRIMARY SCHOOLS

LS in primary schools is cluster based and is organized and facilitated by initiative of the municipal officers of MINED, in which in service teachers of primary schools plan, observe and discuss a research lesson.

These LS are monitored by local officers of MINED and, in some cases, by the Project. The implementation's cost is covered by the municipal offices of MINED and by schools themselves. The implementation structure is as shown in the following diagram.



The coordination committee is enclosed by the red line (its members: Pedagogical advisers and the directors of each school or clusters of schools) and the implementation committee is enclosed by the blue line (its members: the directors of each school or clusters of schools and teachers of all grades). The groups enclosed by the dashed lines are the implementation committees of each school or cluster of schools.

#### 5. OUTCOMES THUS FAR

In Nicaragua, Introduction of LS is an ongoing process that began with the implementation of PROMECEM 2, some of the outcomes achieved thus far are related to pre service teachers and in service teachers:

- Effects upon Practice Teaching Students (pre service teachers)
- The participation of these students as pre-service teachers in the LS implemented in the

Teacher Training Schools motivates them to do LS in their Teacher Practicing.

- Effects upon Teachers

Teachers are improving their teaching. LS is giving an opportunity to deliberate on:

- Teachers of Mathematics and its Didactics are improving the application of Problem Solving Approach.
- Use of Textbooks and Guiding Books (corresponding to elementary education) has improved.
- Use of the Mathematics and its Didactics Guide (corresponding to Pre service Teacher Training) has improved.
- Communication of teachers as a team has improved.

#### 6. CHALLENGES FOR IMPLEMENTING LS

Thus far, we had recognized two types of challenges related to the implementation of LS, those related to external facts and those related to the process itself.

Extrinsic challenges

- Encourage and motivate teachers
- Implementing LS in rural regions
- Make sense that LS isn't a punishment or an extra task that carries difficulties neither the possibility of being dismiss.
- Implementation of LS in Schools of only one Teacher

Intrinsic challenges

- Promote deep discussions
- Improve the moderation in Reflection

Some possible actions to face these challenges could be the following:

- About propagating LS and making sense of advantages
  - Encourage and motivate teachers: broadcasting results, practicing teachers' interviews and videos that show good experiences.
  - Rural regions: Organizing LS through TEPCE and Pedagogical Meetings and Implementation of School based LS.
  - Make teachers see LS as a chance of professional improvement and a way to open the classroom to colleges that will show them how to convey a better lesson to the students.
  - Promote LS in which participants are pedagogical advisers and Cluster Director and teachers of the nearest schools.



- In the process
- a. Point out the things that matter and may produce some learning for participants before Open Class and revise the LS Guide in order to include specific examples.
- b. Fundamental roll of the Moderator: Include list of specific functions and examples of how a moderator must be and behave during post lesson discussion.

## **7. OUR VISION AND FUTURE PLAN**

Getting advantage of the context and of the feasible of LS implementation, we are looking forward in order to set our vision and future plan about LS implementation. Currently, this vision and plan are as follow (but this could change in order to improve while we go through):

Vision: LS will be an official Preservice and Inservice teacher training methodology because of its low cost of implementation and its high richness in outcomes.

Expects: We hope LS will improve teaching and students will raise to a higher level of outputs.

Our Future Plans:

Short term: Create a National LS Team: 17 Province Advisers, 17 municipal advisers and 17 Elementary School Directors as the first National LS Group. Implementation of LS with all Teachers of Teacher Training Schools.

Long Term: National LS Team promote the implementation of LS at national level.

## Pathways to Professional Learning: Lesson Study at GagasCeria Preschool

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**Abstract:** The growing concern to the importance of the early years to children’s lives has inclined the numbers of early children education (ECE) institutions across the country. As the government locates ECE within informal setting, it welcomes various providers, ranging from public, private, not-for-profit, charitable, religious centers and community players, to establish preschool and child care with different directions and orientations. Such figure reinforces the confusing mix and great divide in managing and regulating provisions for ECE services. In particular, there is contention that relates to the qualifications and professionalization of ECE educators. Their qualifications are diverse and generally lower than those in primary or secondary education. Although the government provides teacher training programs, it still faces considerable difficulty due to the government’s limitation in dealing with a huge numbers of ECE educators. Therefore, the opportunity to trainings and course programs does not spread evenly. It then drives ECE institutions to provide professional development by themselves. However, it also has considerable constraints, particularly in finding resources. In this paper, such recurrent problems within the field will be reflected into the situations faced by GagasCeria preschool. By drawing on historical accounts relating to our school policies and practices on professional development, this presentation underscores the important role played by Lesson Study. As the first preschool in the archipelago that has implemented self-directed Lesson Study since 2009, it is stimulating to discuss the key challenges and possible changes that give rise to strategize Lesson Study for improving both working and learning conditions of preschool teachers. By doing so, the authors aim to illuminate a dialogue in projecting integrated actions of professional learning for ECE educators, which may also be of interest for those who have similar situation and expectation.

**Keywords:** professional learning, Lesson Study, Indonesian pre-school.

## 1. OVERVIEW OF INDONESIAN EARLY CHILDHOOD EDUCATION

Early childhood education (ECE) has become a national public movement in Indonesia, since the Ministry of National Education and Culture (MONEC) declared "Indonesian Golden Generation" on the National Education Day on July 2012. Such a long term goal is expected to mark our 100th Independence Day anniversary in 2045.

Structurally, kindergarten and elementary school were in the same directorate, however, after Dakar Framework, in 2001 the MONEC launched the Directorate General of Early Childhood Education. Two years later, the new national education system was commenced that redefined: 1) early childhood education is addressed for children aged 0-6 years; 2) developmental process of early childhood is promoted by means of educative stimulation; (3) The aim of early childhood education is to assist wholly the child's physical and mental growth and development; 4) educational process in early childhood is aimed at preparing the further education (Sujiono, 2012). Consequently, the new regulation has shaped both formal preschool (Kindergarten, for children aged 4-6 years) and non-formal preschool (Child care for children aged 0-6 years and Playgroup for children aged 2-4 years).

Nowadays Indonesia has about 30 million early childhood and the gross enrollment rate (GER) of children in preschool in 2012 is 34.5% which is still below the the government's target of achieving approximately 75% GER by 2014 (Latif, 2013). Therefore, the government promotes the increase number of preschool institutions as to enhance the opportunities of underserved children in preschool level. Such effort gives rise public attention and understanding about the importance of early childhood education (ECE). The total numbers of pre-school institutions is growing rapidly, as well as the numbers of children participating in pre-school education. However, the remaining issue is about the lack of qualified preschool educators. Many pre-schools recruit and appoint under-qualified teachers as to respond to such growing demands.

Ministry of National Education and Culture (MONEC) overcomes this issue by means of 1) establishing a national standard for qualification and competencies of early childhood educator; 2) providing teacher training and course program; and 3) encouraging all private preschool institutions to design their teacher professional development. Indeed, it is not easy to deal with the teacher quality issue due to the following reasons: 1) the problem of teacher supply and demand; 2) the recruitment of under-qualified as to fulfill the growing demand of pre-school teaching workforce; and 3) MONEC has limited capabilities in providing professional education for a large numbers of appointed preschool teachers. Even though the Directorate General of Early Childhood Education has delivered

training courses, workshops and conferences, it provides unequal opportunity for all teachers. In fact, preschool teachers are facing a lot of obstacles, particularly in finding sound resources required for their professional development. In addition, many teacher training programs are lacking of practical application.

## 2. TEACHER PROFESSIONAL DEVELOPMENT AT GAGASCERIA PRESCHOOL

To meet such challenges, each preschool institution establishes their teacher professional development program, in addition to the government's teachers training program. As private school, Gagasceria preschool has also established such a program as to contend with competing demands in delivering a high quality of preschool education.

When a novice enters the profession, they will perform many tasks: interacting with children, working with family, being part of school team, and implementing school curriculum, standards and assessment (Feeney et al, 2010). Our school has realized that the significance of professional development is crucial for the quality of early childhood education practices in terms of understanding a child's perspectives and developmental stages, designing play and learning activities, creating suitable environment for children learning, establishing harmonious collegiality, and so on (Kadota, 2012).

Based on NAEYC definition, Gagasceria believe that professional development is a continuum of learning and supporting activity designed to prepare individuals for working with and on behalf of young children and their families, as well as ongoing experiences to enhance this work. These opportunities lead to improvements in the knowledge, skills, practices, and dispositions of early childhood professionals. A professional development intervention that has three components: a) a comprehensive tool kit; b) a provision of integrated high-quality workshops; and c) two variants of coaching that purportedly could lead to practice mastery. In making those intervention, Gagasceria Preschool classify teacher professional development in to three activities as follow:

### 2.1 Pre-service training

Pre-service training serves for a new teacher that will joint at Gagasceria Preschool. Gagasceria accepts motivated teachers with various background of their undergraduate education. These differences have made our school to do much more effort for teacher's pre-service program.

## 2.2 In-service training

However strongly motivated a new teacher entering the teaching practice, they will always encounter difficulties in playing the teacher's role (Orenstein et al, 2011) without any preparation. Therefore, our school also provides In-service training. It consists of several days of lectures, classroom observation and reflection, and other kind of workshops delivered inside or outside the school. The training is designed based on teacher's need and stage of teacher development.

## 2.3 Routine Activities

There are various ways to support teacher learning and development:

### ➤ Weekly meeting

Every week teachers gather to discuss and share their experience in their own classroom, the relationship with parents, and other issues at school. Sometimes teachers conducted book review activity or small workshop on early childhood education or discussion around teaching issues.

### ➤ Classroom newspaper

Regularly, teachers publish their own classroom paper that inform about classroom activities or special occasions that happened at their classroom. Actually, such activities might help teachers to improve their writing skill.

### ➤ Lesson Study

Lesson Study is daily activity that is conducted by teachers as learning and research process in order to improve the quality of the lesson. Such collaborative approach improves the quality of lesson planning, observation, and reflection upon children learning.

## 3. DISCUSSION ABOUT LESSON STUDY

### 3.1 Lesson Study in Indonesia

Lesson Study is a model of Japanese school-based teacher professional development centering on classroom collaborative research. It facilitates the exchange of experiences between teachers through collaborative planning, participatory learning, the enhancement of professional dialogue among teachers, and teacher reflection (Matoba, 2007). Lesson study has been introduced and spread faster since early 2000s in Indonesia by a cooperation between Japan International Cooperation Agency, Indonesian MONEC and several universities (Suratno, 2012). Initially, Lesson Study has been introduced to junior high school level only, however, it is now disseminated to high schools and elementary schools. In several countries, lesson study is widely used across the continuum from secondary to preschool settings (West-Olatunji et al: 2008).

## 3.2 Typical of Lesson Study

The most interesting aspect of Lesson Study is the mechanism it provides for studying and improving the methods teachers use. Lesson Study breaks away from the model of expert telling teachers what to do. Rather, it assumes that teachers learn to teach by treating teaching as an object of study – by trying to improve teaching by studying carefully what works and what doesn't (Stigler and Hiebert, 1999). Through Lesson Study, the classroom becomes the teachers' laboratory for continuous improvement of teaching and learning (Wang-Iverson and Yoshida, 2005). Teachers in Lesson Study groups are not only improving their own knowledge and skills but are also contributing to a knowledge base that may, potentially, inform more permanent improvements over time (Stigler and Hiebert, 1999) since Lesson Study contribute to build an environment for teachers to be reflective and good observers.

## 3.3 Lesson Study in Preschool

Lesson Study was never formally introduced to Indonesian early childhood education sector. Therefore, there is no resource or reference to be accessed about the practice of Lesson Study in Indonesian preschool level. This is not only in Indonesia but also becomes an issue globally. In most countries, Lesson Study approach is spreading to early childhood education by adapting existing approach (Akita & Lewis 2008), which is the typical of Lesson Study in primary school.

It therefore becomes a challenge for GagasCeria preschool, as an institution that organizes playgroup and kindergarten for children aged 2-6 years, to introduce Lesson Study as a teacher professional development in order to create a learning community and to promote teacher as researcher. Our school has been using Lesson Study since 2009 as one of tools for teachers professional development based real-classroom context, besides the other various pre-service and in-service teachers training annual program.

In GagasCeria preschool, all teachers have to participate in on-going and sustained Lesson Study cycles in order to learn something from each of the things they do, whether it is conducted internally or by participating in other schools' activities. Moreover, through participation in Lesson Study, our school encourages each teacher to plan their personal learning journey as to improve themselves both professionally and personally. We thus strongly believe that teacher is a lifelong learner, so teacher might show to students what lifelong learning is all about, and why it is so important. This is the best way to help students to see the best life they can lead is a life where they never stop learning. Teachers must promote this idea by never stopping their learning endeavors. In our view, Lesson Study comes with an idea that teacher can develop their

professionalism through learning and researching their own work and life.

Therefore, the way early childhood education examine classes is different from another form of existing lesson study. It does not compare and examine the teaching plan and its enactment, but it observes what activities and events are children experiencing in practice, how they are recorded for recollection, and how they “reflect” and examine the case to be interpreted with colleagues (Akita, 2011).

The successful adoption and implementation of Lesson Study in pre-school setting require changes in the mindset of both teachers and leaders. Lesson Study is often misunderstood as focusing on creating perfect lessons. This is not about observing and evaluating the teachers teaching the lessons. The focus is on the students and how the lesson facilitates learning (Lewis et al, 2009). Since preschool teacher is always expected to engage in an ongoing cycle of observing, guiding learning, and assessing children's progress (Dodge, 2006), Lesson Study become an appropriate tool to support such teacher's roles.

### 3.4 Benefits of Lesson Study at GagasCeria Preschool

#### 3.4.1 Teaching quality

Effective Lesson Study will have a long-term impact on teacher professional development. For instance, teachers can develop a strong understanding of the content knowledge and pedagogical knowledge. Specifically Lesson Study improves several foundation skills for teacher such as: a) lesson planning: designing a lesson with high level of prediction and anticipation, and arrangement of teaching materials; b) classroom management: being responsive to the children, observing their learning and development; c) reflecting the lesson: analyzing data, making interpretation, and re-design the lesson to support children learning and development. Some teachers believe that the most important thing in lesson is lesson plan, but in fact there might be a risk that the regular lesson plan is followed technically without critically reflected by the teachers (Runesson & Gustafsson: 2012). Therefore, if teachers design the lesson rigorously then it is likely to have great impact on student learning.

#### 3.4.2 Teacher's collegiality

By working in groups to improve instruction, teachers are able to develop a shared language for describing and analyzing classroom teaching, and to learn each other about teaching (Stigler and Hiebert, 1999). In addition, Wang-Iverson and Yoshida (2005) describe about what makes Lesson Study unique, when compared to traditional professional development:

- It is teacher-led, long term professional learning.

- It is planned collaboratively over a periode of time through intensive study of materials, standards, and students; It was found that lesson preparation was done in a more in-depth manner.
- It supports a collaborative focus on student thinking through observation of classroom practice in real time, sometimes with external experts; the support of the knowledgeable other was critical.
- It offers a process that makes a goal (e.g., enhancing student motivation for learning) for learning concrete through an actual lesson.
- It provides fresh perspectives on teaching and learning.
- It fosters shared reflection based on classroom evidence
- It concretizes the idea of teacher reflection, as well as what problem solving looks like and what thinking entails
- It involves long-term participation of knowledgeable others.

#### 3.4.3 School's culture

Lesson study is a culturally centered professional development tool that stresses group rather than individual goals and outcomes (West-Olatunji: 2008). Lesson Study provides two important pieces that are often missing from traditional professional development: the direct observation of students and teachers in the classroom, and teachers coming together to discuss what they have observed. Such reflection and discussion session on teachers team called as collaborative research process. During the discussion, teachers are learning each other: senior teachers and also the junior teachers. The culture of Lesson Study puts together all teachers on the same level during the process. The goal of their collaborative work is to improve the lesson rather than examine teacher or classroom activity.

#### 3.4.4 Conclusion

Among the roles of the teachers are researcher and learner. Therefore, professional development is actually part of the job description, an ongoing and continuous process, rather than a qualification for employment. Perhaps the most important prerequisite for employment as a teacher is the learning disposition. Early childhood education sector need to consider alternative models of teachers professional development. Lesson Study offering professional learning process and continuous improvement of teacher's daily role by observing the children. For teachers, watching lesson from the student's perspective can build knowledge of student thinking and motivation to improve their own instruction (Lewis et al, 2012).

Becoming a qualified teacher will require consistent opportunities over long periods of time

for teachers to study and improve their own practice. There are at least three ways to improve the lesson: individual teachers, teacher community, materials and tools (Lewis et al, 2009).

Lesson Study provides a continuous learning pathway for teachers to improve the lesson. Therefore, GagasCeria Preschool has been conducted Lesson Study for five years as regular activity for teacher. It gives more benefits on developing teacher both as learner and researcher. By so doing, teachers can plan, observe, and reflect upon the lessons better time by time. Lesson study can establish a school's learning culture in order to improve the quality of teaching and learning. Finally, it is hoped that teachers, educational researchers and teacher educators could respond positively and work collaboratively to spread the benefits of lesson study in preschool sector.

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# Skills in Designing and Implementing 5-E Multi-Model Learning through Craft Model Training on Lesson Study Based Science Teacher Association at State Junior Secondary School in Kendari City

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**Abstract:** Science teacher skills in designing and implementing learning multi-model E-5 is still low and is an urgent issue to be addressed. This was important to accommodate the diversity types of learning styles and maximize the growth and development of each student character through the learning process. This study is the first stage of the two stages to be carried out. The primary objective is to improve the teachers' skills in designing and implementing the multi-models 5-E lesson study based Science Teacher Association in Kendari. The study was designed using pre-experimental One-Short Case Study Model Craft training. Participants were 20 science teachers from 12 secondary schools. Lesson study conducted regularly every two weeks to develop seven multi-variation models, including 21 sessions, teaching the seventh grade using the 2013 curriculum. Learning preparations and peer teaching were carried out for seven cycles (late August to November 2013), and the real teaching were carried out for 10 cycles (the end of January to May 2014). Quality assessment of the teaching preparation and implementation was done by using the observation sheet which had been validated by the expert team. Results show that the teachers' ability in designing the multi-model E-5 teaching preparation has increased on the fifth cycle after a given reflection on peer teaching activities. In real teaching, participants have shown good skill to apply the model after the sixth cycle. Constraints faced by teachers in designing teaching preparation and habits that need to be avoided in applying the model are also discussed.

**Key words:** Multi-model E-5, Skills, Craft Model, Lesson Study, Science Teacher

## 1. INTRODUCTION

Indonesian Law of National Education System 2003 article 1verse 1 mandates that one of the functions of national education is, "... to develop the potential of learners to have the intelligence, personality, and noble character." The implication is that the Indonesian people is hoped not only intelligent, but also have a good character. By doing so, the later generations will be born a nation that grows with the characters of the noble values of the nation and religion. Being aware of today's society character, the government of Indonesia took the initiative to give priority to the development of the nation's character. This was reflected in the Indonesia National Long-Term Development Plan for 2005-2025, which puts the first character education as the mission in order to realize the vision of national development (Kemendiknas, 2010)). This is even more evident in the presence of characters core competencies in the 2013 Curriculum beside Process Competence and Core Competencies of subject areas (Kemdikbud, 2013).

According to Lickona and Davidson (2005) and Pala (2011), the character is a set of qualities that distinguish one individual with another individual. Good character is not formed automatically, but developed over time through a continuous process of

habituation, giving examples, and exercises (Pala, 2011). Character education is the foundation for students to be able to achieve the best academic performance (CEP, 2013). Semiawan (2012) states that education-oriented character development cannot be based on the perspective that students are empty glasses to be filled by teachers with the same content in the same way, but starting from the perspective that students are the seeds which have the diverse potential advantages. Schwartz (2008) emphasizes one of effective character education programs that have a significant impact and lasting is to use multiple strategies, namely multi-strategy learning approach. Arends (2007) explains that apply two main strategies to meet the needs of all students means applying multi-model teaching (multiple models of instruction). Woolfolk (2008) states that presenting information with a lot of models is very useful activity. Joyce *et al.* (2009) emphasizes the placement of multiple models in a single learning program in the sense of combining multiple models appropriately in a particular model is very important to establish reliable and multitalented learners. Slavin (2011), the use of many methods of teaching in the subject teaching describes as effective learning.

The results of the study (August, 2011) of the teaching preparation and the biology teachers teaching activity in junior high schools in the city of

Kendari shows that the application of methods, strategies, models of learning in any subject matter tend to be monotonous, less variation, and incomplete. This problem is a challenge in order to support the development of potential diversity, including the diversity of learning styles and character growth and development of students in the 2013 curriculum (Arifin, 2011). A study of Science Process Skills conducted in January 2012, which is based on the instrument developed by Kazeni (2005), obtained information that Junior High School students in Kendari do not understand well each component of the Science Process Skills, in general, students are likely giving speculation answers. Results of Junior High School Science teacher interviews show that Science Process Skills was less trained, not all teachers are able to teach and practice. When it is taught, is not complete because of inadequate Teaching preparation available compare to the number of students (Arifin, 2012).

To be able to grow and develop to the maximum student character through learning, it is deemed important to develop strategies that can facilitate the diversity of learning styles in order to accommodate the learning preferences of each student. Trilling and Fadel (2009) states that the two great challenges of the 21<sup>st</sup> century education, namely; how to personalize learning and differentiating instruction for a variety of classes, because it is obviously proven to have a positive influence on the performance and attitude to learn. Learning strategy that was developed called multi-model 5-E, i.e. some model / learning strategies such as inquiry, problem-based teaching, direct instruction, cooperative learning and learning strategies (PQ4R and concept maps). Those models are integrated and appropriate to the characteristics of the learning material in any 5-E learning cycle (*Engage, Explore, Explain, Elaborate, and Evaluate*), adapted from the BSCS (2009).

Multi-model learning allows students to learn the scientific approach; follow the scientists working procedure to discover science through scientific work, teach skills through modeling, working together, and train students to become independent learners. Duran *et al.* (2011) stated that one of the most powerful strategies and have proven to have a positive impact to reach the standard of science education is the use of the learning cycle and learning models. The expected result of the implementation of the multi-model 5-E is to increase student achievement. Besides, it is also aim at growing and developing students characters associated with the scientific attitude, such as: honesty, curiosity, responsibility, self-contained, open-minded, critical, creative and innovative, careful and meticulous, hard work, discipline, confidence, cooperation, democratic and communicative.

This article is the first stage of the research results of two planned phases. The study focuses on improving the skills of teachers to design and implement learning strategies multi-model E-5 on activity-based lesson study for science teacher association in Kendari. Lesson study carried out by using a Craft training model, the trainer was the main resource person (the model) and trainees follow carefully the multi-model E-5 and its application given by the trainer (Wallacea in Noor, 2001).

## 1. METHODS

This research is the development of a learning strategy by using a model of the design Pre-Experimental One-Short Case Study Craft training models based on the activities of the lesson study for science teacher association in Kendari. The number of participants was 20 science teachers from 12 Junior High School. Lesson study conducted regularly every two weeks to develop seven variations of multi-model E-5, which includes 22 sessions teaching seventh grade science based on the 2013 curriculum. Modeling and peer teaching were setup and executed as many as seven cycles (implemented at the end of August till November 2013), and the real teaching done by 10 cycles (End of January to May 2014).

Lesson study procedures were applied in this study are as follows:

- Preparation, includes: (1) forming the lesson study group consisted of 20 junior high school science teacher-Biology in Kendari as a member, and two teachers and their core researchers as a companion to help researchers; (2) Researcher created model of multi-model 5-E Teaching preparation (lesson plans, worksheets and guideline, teaching materials and assessment sheet), and then validated by a team of experts; (3) The researcher guided the core teachers to create models of multi-model 5-E Teaching preparation based on a model that has been validated; (4) a work plan and schedule of lesson study is based on the framework of the development of multi-model 5-E learning strategies, that has been designed by the researcher; (5) core teachers teach how to make teaching preparation and implement multi-model 5-E to lesson study participants; (6) the lesson study participants share the task of making the teaching preparation in other subject matter based on a model designed by researcher and core teachers; (7) participants take turns to act as peer teaching teacher modeled and use the lessons that have been made, while others act as students as well as an observer along with the core researchers and teachers; (8) each participant



revise teaching preparation based on the reflection and discussion.

- Implementation phase in the classroom (real teaching), including: (1) teachers do real teaching at their respective schools, and the lesson study participants are as observers based on the division of the agreed schedule, accompanied by the core teachers and researcher; (2) observational learning is done by using the multi-model 5-E observation sheet which has been validated by a team of experts; (3) the results of learning observations are reflected, discussed, and modified.

### 3. RESEARCH RESULTS AND DISCUSSION

#### 3.1 Teaching preparation of multi-model 5-E

Based on the multi-model 5-E teaching preparation assessment sheet, some problems had been identified that generally need to be fixed by the lesson study participants, especially in the second cycle (after given the model) up to cycle IV. The percentages of teaching preparation need to be improved are as follows:

##### 3.1.1 Syllabus

- The syllabus needs to have indicators and objectives (100% syllabus).
- Learning column on the syllabus is to be given an outline of what will be done by the students (51%).

##### 3.1.2 Lesson Plan

- Indicators and learning goals has not appropriate yet (19.2%).
- Learning and assessment activities do not support the achievement of basic competencies (22.3%).
- Aspect of a character that wants to be fostered and promoted at every step of the 5-E learning cycle has not clear yet (23.6%).

##### 3.1.3 Student Activity Sheet (SAS)

- Purpose on SAS is not appropriate to the learning objectives in the lesson plan (27%).
- The formulation of goals in SAS has not in harmony with the activities carried out by students (29.6).
- The questions in SAS less referring to the results of activity (23%).

##### 3.1.4 Product Test

- In testing the aspects of product, the questions are not only measure aspects of knowledge but also developed to the high level of thinking (14.7%).

##### 3.1.5 Assessment Process

- Rubric assessment sheet is still common (18.9%).

Teachers do not put indicators and objectives in the syllabus due to the reference formulation based on the draft syllabus 2013 syllabus curriculum developed by the Center for Human Resource Development Ministry of Education and Culture. Similarly, the syllabus does not include an outline of what will be done by the students in the classroom. This is also happened to aspects of the character to be fostered and promoted in every 5-E learning cycle is not visible. Social learning theory of Bandura (1977) states that in general people learn at least from the closed-model before conducting a specific behavior. This is to avoid making unnecessary mistakes.

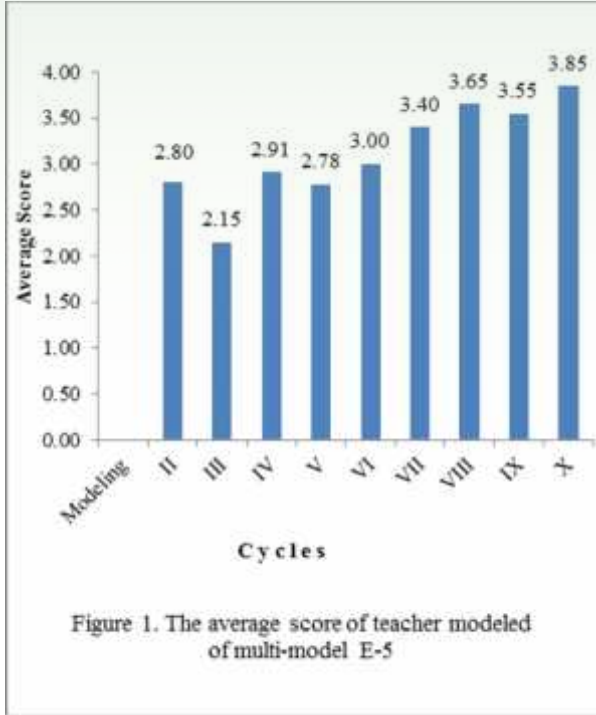
The study also found a discrepancy in the lesson plan between the indicator and the learning objectives. This is because the indicators are developed refer to the basic competencies that contain the concept or the study of physics. Similarly, the learning activities do not indicate or lead to the achievement of basic competencies. Student Activity Sheet contains some purpose not in accordance with the purpose of learning in the lesson plan. The Student Activity Sheet only contains most goals in the lesson plan. Other objectives will be achieved through other activities, such as discussion. A product test to higher level thinking in early learning based on experience is not developed yet. This is because in general students in Grade VII have not been trained to apply higher-level thinking. At subsequent meetings, then the high-level thinking skills trained. Some sections of the assessment process are still common, rise to a broad interpretation. The implication will lead to differences in interpretation of the evaluator. In anticipation of a different interpretation of the observer, the researcher then lead a meeting to have to have a same perception among observers, so that differences in interpretation can be minimized and the purpose of the assessment process can be achieved.

Constraints faced by science teacher lesson study participants in designing multi-model 5-E teaching preparation is the knowledge and understanding of a very wide variety of models and learning strategies that form the basis of multi-model. Moreover, according to the teachers, the 5-E learning cycle is a new thing, however, after the teacher modeled given reflection, then start the cycle V each participant's has reached a good average for their teaching preparation. Lewis *et al.* (2006 in Ibrahim *et al.*, 2014) illustrates that in the scheme of the two estimates of how the lesson study improve the quality of learning; that through collaborative lesson planning, the creation of the plan and a good

teaching preparation, there will be an increase in the quality of learning in the classroom.

b. Real Teaching

The mean scores achieved each teacher in each cycle models / meeting is presented in Figure 1 and Figure 2 as follows:



Based on Figure 1, after the core teachers show a model to the participants in the first cycle, then in the second cycle to cycle V multi-model 5-E the mean score of learning process that is achieved by teacher modeled is still fluctuate with a score of <3.0. This fluctuation is likely due to differences in the participants experience and teacher modeled performance, as well as external environmental factors at each school.

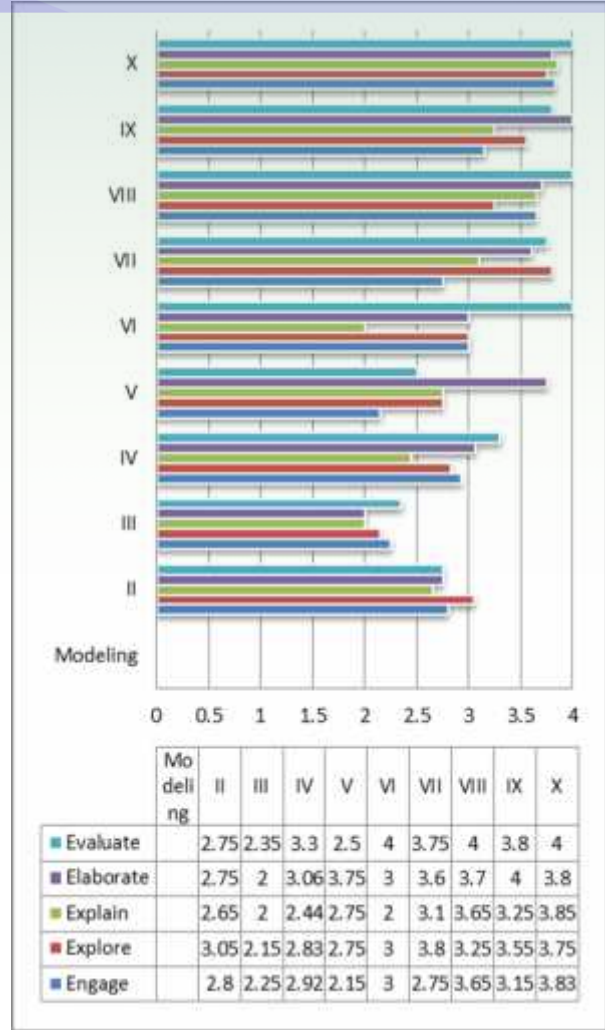


Figure 2. The implementation stage of multi-model E-5 for Every Cycle

Multi-model learning practiced by teacher modeled during the phase of real teaching in Cycle I and II use 5E-Direct Instruction (DI) -Inquiry. Cycle III and IV: 5E-DI-Cooperative Learning (CL) NHT. Cycle V: 5E-DI-Concept Mapping. Cycle VI: 5E-DI-PQ4R. Cycle VII: 5E-CL NHT-Concept Mapping. Cycle VIII: 5E-CL TPS-PQ4R. Cycle IX: 5E-CL-Jigsaw and inquiry. In Cycle X use E5-CL TPS-PQ4R.

Insight and knowledge of lesson study participants about aspects of each phase of the 5-E learning cycle is a factor that influences the performance in implementing the 5-E learning multi-model. Performance score of the teacher-model in each phase of the 5-E learning cycle presented in Figure 2; it appears that the fluctuation is relatively the same as the Figure 1.

In addition, in order for the application of the 5-E learning multi-model can optimally focus on the student, the teacher-models skills in implementing

the principles (things that need to be avoided) from the teaching of basic skills is also very important to be studied. The principles of teaching skills are as follows:

(1) Questioning skills; teacher models often repeat students' answers, answering his own question without trying to give guidance to students, and ask questions that invite answers simultaneously. These problems will hinder the assessment process. (2) Reinforcement; teachers generally give less reinforcement, both verbal and non-verbal. Even giving reinforcement often seems less warm, enthusiastic, and not be done immediately. (3) Learning variation; eye contact is intended only to certain students and teachers only be in one place and less make the turn position in the classroom, in guiding the discussion tends to be in certain groups without paying attention to group that needs more guidance. (4) Explaining; teachers still tend to be a lot of comments/lecturing and less guiding students to appreciate and use of evidence in solving a problem or formulate conclusions. This is resulted in the use of more time in each phase and less suitable to the lesson plan.

The phenomena of using the principles of teaching skills that have been presented are often visible at the end of the cycle, although the reduction has occurred. This is one indication of the importance of the well planned lesson study carried out continuously so that bad habits teacher in learning can be eliminated gradually. The study results of Subadi *et al.* (2013) showed that there are four issues to improve the professionalism of teachers through lesson study namely; (1) the internal problem of the teachers; (2) external issues; students, principals, education superintendent, environment, curriculum and facilities; (3) The problem with the commitment of teachers, and 4) the problem with the teacher concerns.

After several reflected and additional discussion of each stage of the 5-E learning cycle, then start the cycle VI scores achieved relatively increased teacher models and has been categorized as good (score 3.0) until the cycle IX (last meeting). According to Ono *et al.* (2013), the reflection is intended for process improvement cycle, so the quality of the reflection phase is seen as important to the success of the activity.

## 2. CONCLUSIONS AND RECOMMENDATIONS

Based on the research results, it can be formulated conclusions, namely, (1) Training Craft model on activity-based lesson study at junior high school science teacher association can improve teachers' skills to design and implement learning multi-model 5-E models. (2) The main obstacle that lesson study

participants in designing a learning tools is the lack of knowledge and understanding of the learning models and learning strategies as well as the 5-E learning cycle that is the basis for designing learning multi-model 5-E . (3) To improve the skills of teachers to implement the 5-E teaching multi-model-based students, the principles of the application of teaching skills need to be assessed as well.

Based on the results, this study suggested that activity-based Lesson study for Junior High School Science Teacher Association must be well-planned and implemented continuously. This is to broden teachers insight into the learning models, learning strategies as well as the phases of the 5-E learning cycle. By doing so, it is expected that teachers unprofessional habits in applying the 5-E learning multimodel can be eliminated gradually.

## 3. ACKNOWLEDGEMENTS

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## Application of Blended Learning in Chemistry

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**Abstract:** This lesson study examined how problem-based learning (PBL) and online flipped classroom are incorporated to help students construct the Chemistry knowledge on Qualitative Analysis. Students are given the opportunity to develop higher order thinking skills, through the problem-based learning approach, to allow students to play a more active role in learning. They can deepen their understanding and knowledge through self-directed learning (SDL), as they can explore beyond the classroom. Collaborative learning (CoL) is incorporated to promote meaningful interaction among students, and between teacher and students. To develop a learning community among the students, Information Communication Tool (ICT) is tapped on to provide a space to engage students more meaningfully and to track their learning progress. Thus, these different teaching modes are integrated to create a student-centered learning experience, which increases the students' learning and engagement level, in a safe environment. Based on the quantitative data, it is observed that students are receptive towards such learning modes.

**Keywords:** blended learning; student-centered; flipped classroom; problem-based learning; collaborative learning

## 1 INTRODUCTION

In alignment with Seng Kang Secondary School’s mission to nurture lifelong learners, a Professional Learning Team (PLT) worked collaboratively and implemented Blending Learning to enhance students’ learning. According to Catlin R. Tucker, Blended Learning in Grades 4-12, 2012, pg 11, blended learning refers to “the spectrum of teaching modes that combine traditional face-to-face instruction with an online component.” The purposes are to increase the students’ learning and engagement level, through collaborative learning using Information Communication Tool (ICT), in a safe environment, as well as to develop higher order thinking skills through the infusion of problem-based learning (PBL).

As Mr Heng Swee Kiat, our Ministry of Education, at the Ministry of Education Work Plan Seminar 2014, mentioned that ‘our students are changing’ and ‘demands in the future for our young people are changing - new jobs, new ways of working, new technologies, and new countries they will have to go to’, and thus ‘the ways we (teachers) are teaching are also changing. As we learn more about how people learn, we are improving our pedagogy.’ Thus, our PLT hopes to produce lesson packages which allow students to be exposed to the 21st Century Competencies of communication, collaboration and information skills.

## 2 METHOD

### 2.1 Participants

This lesson study involved forty Secondary Three Express Stream students, of age 15 years old.

### 2.2 Procedure

Blended Learning was implemented over 4.5 hours, over 8 sessions, facilitated by three teachers. The cycle included the following:

- Introduction of the Google site. Students were to watch the videos, uploaded on the Google Site, over the one week holiday, to help them to master the concepts at their own pace and time, based on their different learning ability. (flipped classroom concept)
- Students were then assessed on the practical skills, which they have learnt through the videos, to checking for understanding. (assessment for learning)
- After which, teachers explained the theoretical concepts of qualitative analysis of salts, with the use of the videos to strengthen the learning process. (traditional face-2-face teaching)
- At the last stage, each group of students was to solve their assigned problem-based

scenario collaboratively. The draft plan was submitted via the Google Site and peer feedback was gathered during class presentation. Upon improving their plan based on the feedback gathered, each group was to carry out the experiment to confirm their prediction. A report submission was finally expected from each group. (higher order thinking skills through problem-based learning)

An assumption was made that students required specific time to be set aside, for teachers to guide them to give constructive peer feedback, hence, an additional of one hour was set aside.

## 2.3 Results

### 2.3.1 Quantitative Analysis

Below are the questions that the teacher-facilitators had surveyed the students.

- I am involved in learning activities that helped me to analyse and evaluate the research information that resulted in improving my understanding of qualitative analysis of salts.
- The lesson allows us to work on learning activities that allow us to design our plans for the task.
- The use of Google Site allows peer learning, that is, I learnt from my peers’ feedback, which helps me to refine my plans.
- The use of Google Site facilitates peer learning which allows my group members to learn from each other.
- During the lesson, my classmates and I contribute ideas and consider the viewpoints of others to solve a real-life scenario.

Table 1 shows results from the perception survey conducted on 37 students.

Table 1: Results of the Perception Survey

Area of focus	Question No.	% of students who agree	% of students who disagree
Critical thinking	1	94.6	5.4
	2	94.6	5.4
Collaborative learning using ICT	3	97.3	2.7
	4	97.3	2.7
Articulate confidently	5	91.9	8.1

As shown in Table 1, the positive results indicated that students were receptive towards the different modes of learning.

### 2.3.2 Qualitative Analysis

Responses from the teachers were collected, so as to identify challenges and difficulties faced.

➤ Process of Flipped Classroom Concept  
Teachers discussed on the readiness level of the students towards flipped classroom model. They noticed that students, who completed their self-directed learning using the videos, were able to complete the practical assessment. However, there was a small group of students who lacked the self-discipline in such academic setting and thus hindered their learning progress.

*“The Flipped Classroom is beneficial for the motivated students as they can view the fundamental practical skills through the videos, and they are able pace their own learning. The individual practical assessment made the students more conscious that self-learning is important. From the test, students can conduct experiments that require practical skills but not on those that require critical thinking”*

*“The Flipped Classroom helps to free up curriculum time which can then be used to focus on the misconceptions observed during the practical assessment. It allows a few students to come forth and ask teacher questions, creating a student-centric environment.”*

➤ Process of Problem-Based Learning  
Through this experience, teacher-facilitators responded that students had difficulties in presenting their thinking on paper.

*“When I monitored students’ draft submission of their plan, I was not able to decipher what the groups want to do to identify the unknown salts. It was only through class presentation that the teachers questioned further for better understanding. The second submission was much better after some guidance from the teacher on the expectations on writing reports.”*

However, teacher-facilitators noticed that students need to be more confident in articulating in front of a class, although they did not have issue discussing within the groups.

*“Some students are not confident in public speaking and needs more practice for confidence building.”*

*“The peer critique session allowed the students to internalise the content and self-*

*arn. The teachers providing feedback on the students’ work was also beneficial as the proficiency level of students may not be high enough to spot some of the errors.”*

Another challenge that teacher-facilitators faced was that few students provided feedback on their peers’ draft plans submitted on the Google Site. Intervention had to be done to ensure that peer feedback was given to each group. Thus, class presentation was conducted where verbal peer feedback was collected, instead of through the online platform.

### 3 CONCLUSIONS

The lesson study is to apply blended learning in Chemistry so as to increase the students’ learning and engagement level, through collaborative learning using Information Communication Tool (ICT), in a safe environment, as well as to develop higher order thinking skills through the infusion of PBL.

From the quantitative analysis, it suggested that varied modes of engagement level seemed to appeal to this group of students who prefer hands-on activities and group work to traditional didactic teaching. They welcomed the idea of learning from their group mates as they could tap on one another’s strength and work harmoniously.

Teachers involved in the planning and facilitation felt that our students may not be ready to utilise an online component to develop effective learning community. As Catlin R. Tucker mentioned ‘...research suggests that they can be successful for independent, motivated, and self-discipline students.’ As teachers, we have to put the necessary inspiration and structure in place, so that students can be more receptive and engaged towards online learning.

Nevertheless, the use of blended learning provided students with varied modes of engagement level, as well as exposure to teamwork and real-world context. Exposure of using online component and providing opportunity for public speaking are two areas in which teachers need to incorporate more frequently into curriculum to be really effective and meaningful.

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## IMPROVEMENT OF STUDENTS' ACTIVITIES IN LEARNING THROUGH DISCUSSION USING *LEVELING STUDENT WORKSHEET* STRATEGY

(*Lesson Study by Taking the Object of Calculus I Course in Semester 2*)

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**Abstract:** As mathematics educator professional candidates, the students of Mathematics Education Department are equipped with professional competence as well as pedagogical, social and personality competence. Courses that support professional competence are skill courses, one of the which is Calculus 1. Calculus 1 is a basic course which must be mastered well by the students. But in reality the students are still hard to understand the material of Calculus 1. It is happened Because they just listen passively to the lecturer during the learning process and they do not want to think independently. Based on reviews these problems, the Lesson Study Team (LS) tried to apply the learning process to improve students' participation through discussion by using the Leveling Student Worksheet strategy. Leveling Student Worksheet strategy was conducted by giving the questions to the students with different levels of difficulty (Level 1 and Level 2). The students worked through group discussion and the results were presented to the class. The activities in this project (LS) were Carried out by 4 cycles and every cycle had 3 stages, namely *Plan*, *Do* and *See*. *Plan Stage* was Carried out by the team in order to develop learning equipments including syllabi, Lecture Plan (SAP), Student's Worksheet (LKM), and modules (hand-out). *Do Stage* was an implementation of *the Plan Stage* (learning equipments) into the learning process performed by a lecturer model. While the other team members did not become the lecturer model, they became the observers of students activities. After learning process had been completed, the team conducted a study or discussion called *See Stage* (reflection).Based on the analysis of the data on the observation of cycle 1 to 4 there was an improvement of the activity in students' learning process. It can be concluded that the *leveling student worksheet* strategy can improve student learning activity.



## INTRODUCTION

The Students of Mathematics Education Study Program are prepared to become mathematics educators. As prospective educators they must be equipped with professional competence, which is one of the competencies that should be possessed by professional educators. To support the professional competence, a curriculum is constructed which includes the subjects of expertise and one of them is Calculus. Calculus course is a basic course that is included in the analysis clump that must be mastered well by students as prospective educators to be the umbrella of mathematics in school. Calculus course in the curriculum of Mathematics Education Study Program of FKIP UMG, is divided into three parts, namely, Calculus I which is given in semester 2, Calculus II which is given in semester 3 and Calculus III which is given in semester 4. While the object of the implementation of *Lesson Study* for the second semester of the academic year 2012/2013 is Calculus I in semester 2.

In terms of concept, the material of Calculus I can be considered as standard, it means that it does not have much changed for the long term. Calculus I includes functions and graphs, function limits and continuity, derivatives and its applications, the integral and its applications. This subject provides the theoretical foundations for the other skill courses. Because the concept is standard then it is necessary to change and improve the problems which are the application of the concept. Besides that, a continuously improvement of the teaching techniques of the learning process in the classroom is needed.

The previous learning process is still relatively conventional learning. Learning process such as this is still centered on lecturers and students tend to passively listen to the course given by the lecturer. This passive participation of students in the learning process has an impact on students' understanding of the material, the students are only able to absorb the material that needs memorization just like the definition and nature, but the problems that require reasoning are not mastered by them. As an example, students understand the example of problems described by the lecturers, but they have trouble when working on the problems which are slightly different from the previous problems. It also adversely affects the communication ability and thinking ability. Based on these problems, the LS team tries to apply the learning in an attempt to improve students activities in learning through discussion with the *leveling student worksheet* strategy. *leveling student worksheet* strategy is the

use of LKM (student worksheet) with different levels of difficulty, it is gradually worked through group discussion and the results will be presented in front of the class. Hopefully through this strategy, students thinking skills and communication skills will grow and develop. Thus, the formulation of the problem in this LS-based research is "whether the *leveling student worksheet* strategy can improve the activity of the students in the learning process?"

## Method

To achieve the goal of this research which is to improve the activity of the students through discussion with the *leveling student worksheet* strategy, *lesson study* was implemented in the learning process. In the implementation of *lesson study* three stages were used in each cycle namely *plan*, *do* and *see*. Those three stages were carried out in four (4) times *lesson study* cycles. In accordance with the objective of this study, the focus in the implementation of this *lesson study* was the activity of the students in the learning process.

The subjects who were studied as source of the data in this lesson study were 42 students, while the lecturers involved were Nur Fauziyah, S.Pd., M.Pd., Midjan, S.Pd., M.Pd., Drs.Radi'iim Saputro, M.Ed. and Dra. Adrijanti, M.Pd.

**The stage of plan** was done 1 (one) week prior to the implementation of learning. *Plan* activities jointly conducted with the aim to assess the *teaching plan* and *teaching materials* that had been planned which includes course syllabus, lesson plan (RPP), materials or instructional materials which will be given to the students, teaching methods, student worksheets (LKM), the lecturer model, observers, and evaluation instruments which were needed.

**At the do stage**, lecturer model tred to implement the learning stages according to the lesson plan that had been studied and revised together in accordance with the advice and input. Meanwhile, three (3) other lecturers who did not become the lecturer model acted as *observers*. Observations were based on the observation sheet that had been prepared in the plan activity. Observations aimed towards students' learning activities during the lecturer to find interesting facts and phenomena related to the focus and goals which were to be achieved in the learning process. To strengthen the observation, documentation was created through photos and video recording (*audio-visual*) during the learning process.

**The Stages of Reflection** (*see*). Reflection activities carried out immediately after the completion of learning process. In this activity the

discussion of the facts or interesting phenomenon which were discovered during observations was conducted to analyze the possible causes and find a solution to fix it. The main concern in this discussion was the activities of student learning process not the lecturer model.

**Techniques and instrumentation for data collection.** In accordance with the focus set in *lesson study*, the data required in this lesson study include: (1) students' enthusiasm in listening to the lecturer, (2) The active participation of students in asking questions to the lecturer, (3) The active participation of students in answering questions given by the lecturer, (4) The ability to cooperate in working on LKM, (5) The ability to present the results of the discussion, (6) The ability to respond to the results of the presentations, (7) Timeliness in submitting LKM.

Data analysis technique used in this study was content analysis for the results of observations on *do* and *see stages*. In this content analysis these things were conducted, they are: information collection, reduction, verification and conclusion. To describe an increase in the activity of the students in the learning process descriptive data analysis was used.

## Results and Discussion

The description of the implementation *plan, do* and *see* for every material used in *the open lesson*.

### 1. Cycle 1 Plan (*Plan 1*)

Plan 1 was conducted jointly in the form of workshops of *teaching plan* and *teaching material* held in the *teleconference* room and continued in the math lab. Based on LS subject matter analysis, the decision was taken that the focus in the LS for Calculus I course was an increase in **the activity of the student in the learning process**.

Based on the analysis of the material, the definition and function notation, the area of origin and area results, describing the graph of the function, applying the concept graph of the function in daily problems, operation of functions and composition of functions would be used. For the learning models, STAD cooperative learning was used and the learning method was the discussion with the *leveling student worksheet strategy*.

Next was to revise the teaching materials which was in the form of module and making the material in the form of a power point. The last step was to develop an instrument of observation.

### Implementation (*do one*)

*Do one* was held on Tuesday, March 26, 2013 at 10:30 until 13:00 in the room D3.16. The lecturer model in this implementation of *do 1* was Drs. Radi'im Saputro, M.Ed.

The first step taken by the lecturer model was explaining the learning objectives. Lecturer presented the information to explain the material about definitions and notation functions as well as how to determine the area of origin and area results, drawing graphs of functions, and applying the concept of functions and graphs into real problems. The Media which was used in describing this material was the file in the form of a *power point* and *WinGeom software*. When the lecturer delivered an explanation of the material, **students still looked passive and the learning process seemed in an impressed tense atmosphere**. This was because the activities of *the lesson study* was the first time to be carried out so the students were still not accustomed to the presence of four lecturers in one class. Next lecturer model divided the students into 6 groups which were heterogeneous. Each student was given a name card taped to their backs with the aim to facilitate the lecturer to call the students and for the observers to identify the activities of all students. Each group was given LKM 1 level 1 and discuss it in the group. LKM 1 level 1 were collected after being completed, then two groups presented in front of the class. And so on until the LKM 2 level 2. **These discussions were still not going well, in every group there were still some students who did not dwell in the discussions, there were even a few groups which individually done the LKM without having discussion**. At the time of each group doing discussion to complete the LKM and having presentation, the observers were working hard to observe the activity of all students in each group. The results were recorded in observation instrument.



Figure 1. Students discussed in groups

At the end of the course, lecturer model along with the students concluded the material

and provided direction for further study material which was the material of limit.

### Reflection (see 1)

Reflection activities began immediately after the completion of learning activities, which was at 13:30 until 15:30. The evaluation given by lecturer model were (1) the material was too many so he must be in a hurry in the learning process, (2) collecting the LKM was not in accordance with the planned time allocation, (3) the class discussion was not going well, the question and answer were not well organized.

Furthermore, the observer conveyed interesting things related to current findings in the classroom observation, they were: (1) within each group there were 3 or more students who were not active in working group discussion, (2) there were still some students who do not pay attention when his friend doing presentation especially students who sat in the back, (3) group discussion could not be properly done because each student prefer to work alone in solving problems, (3) there was no clear division of tasks within each group discussion, (4) students were not able to think fast in solving problems in the LKM.

Based on the above problems, the solutions that had been found were (1) the material for subsequent learning was reduced so there will be more learning time for discussion because the focus was to increase the activity of students, (2) instructional materials in the form of a module was given 1 week before the lesson so that students can learn at home, (3) Before learning process started, a statement that the work for LKM have to be done in group not individually was emphasized (4) reducing the number of questions in each LKM and every level was adjusted with the time in the lesson plan.

## 2. Cycle 2

### Plan (Plan 2)

Plan 2 was held on Tuesday, April 2, 2013 at 14:00 until 16:00 in the math lab. The result of this *plan 2* activity were (1) reducing material to adjust with the allocation of time, because the learning process was more emphasized on the process of discussion related to focus in the LS. The material used in the RPP number 2 was the limit theorems and the continuity of a function. (2) Fixing module / teaching materials and immediately distribute them to students for studying in the home, (3) reducing the amount of questions in the first LKM in cycle 1 from more than 6 questions into 2 questions in each level of LKM, (4) organizing material in form of *power point*, (5) planning to give an explanation

to the students at the beginning of the learning process that the LKM was done by discussing, so that the division of tasks within the group should be clear and there was a group leader who led the discussion.

### Implementation (do 2)

Do 2 was held on Tuesday, April 9, 2013 at 10:30 until 13:00 in the room D3.16. Lecturer model for *do 2* implementation was Dra.Adrijanti, M.Pd. The first step taken by the lecturer model was delivering the learning objectives. At the core activities of teaching, lecturer model describes the material limit theorem and the continuity of the function by using *power point*. By the time lecturer model asked questions, students answer it together. **At the end of the explanation, lecturer provided the opportunity to ask for the students, but none of the students asked a question, it still looked like a tense classroom atmosphere.** Furthermore, the lecturer model divided the students into heterogeneous groups of 6 and each student was given a name card taped to their backs. Lecturer model provide LKM 1 level 1 in each group and students working on LKMs by doing group discussions. **The group discussions have been able to run pretty well, the discussions there led by a group leader.** After LKM 1 level 1 was completed, presentation activities did not done directly as in do one, but lecturer model gave LKM 1 level 2 and students rework the group discussion. After LKM 1 level 1 and 2 completed, several groups presented to the class, several other groups respond to them if there were answers which were different with theirs. The same activities was done for the LKM 2 level 1 and 2. **By the time of class discussions, students appeared to have an increase in the activity in giving different opinion for his friends, but the ability of the students in the presentation was still not good enough. There were still some students who were still passive, did not pay attention while the other group doing presentation, especially those who sat at the very back who were repeating students (6th semester).**

At the end of the course lecturer model gave students a chance to ask. Furthermore, the lecturer model along with the students concluded the material and provided direction for further study material was the material derivative.

### Reflections (see 2)

Reflection (see 2) began immediately after the completion of learning activities, which was at 13:30 until 15:30. Lecturer model stated the

problems were: (1) the difficulty of stimulating students to ask questions, (2) some of the students who sat in the back still looked passive, (3) low students' understanding of limit theorem, so that they had difficulty in doing the LKM.

Then observers conveyed: (1) the ability students in asking was low, (2) there were still some students who did not pay attention when his friends doing presentation, especially the students who sat in the back, (3) Group discussion had been able to run well because there was a group leader leading the discussion, (3) the students were not able to think quickly in solving problems in the LKM. Thus, the focus in the LS which was an increase in the activity of the students had not been achieved.

The solutions which had been found to overcome the above problems were (1) to change the seating position for all groups, which initially sitting behind changed into the front seat, (2) the groups that have to come forward to present their discussion were appointed by the lecturer model with the aim that all groups get a chance to present (3) If there were students who do not pay attention at the time of their friends' presentation, the lecturer model immediately warned them, (4) to increase students activity at the third meeting, lecturer model did not explain the material, but the students were asked **to discuss in group to understand definitions and examples of the material.**

### 3. Cycle 3 Plan (Plan 3)

Plan 3 activities held on Tuesday April 30, 2013 at 14:00 until 16:00 in the LS. The aim of the *plan 3* was to improve the learning devices that will be implemented in *do 3*. These improvements were based on the results of reflection (*see 2*) earlier.

The results of *plan 3* activities include: (1) the material which was used in preparing the lesson plan was a high-level derivative and derivative implicit as well as its application in everyday life. (2) Fixing module / teaching materials by using references from some Calculus books and reproduce some example problems and exercises in order for the student to discuss it before learning process was implemented, (3) developing LKM 1 level 1 and 2 and LKM 2 levels 1 and 2, (4) organizing the material in the form of *power point*, (4) planning to change the seating position for students sitting in the back to sit in the front, (5) during the learning plan if there were students who had not been active immediately chosen by the lecturer model to present as well as to respond to his friends' presentation.

Once all the instruments were revised, then the learning instruments were ready to be implemented in the form of learning process called *do 3*.

#### Implementation (*do 3*)

Activities of *do 3* was held on Tuesday, May 7, 2013 at 10:30 until 13:00 in the room D3.16. Lecturer model *for this do 3* was Nur Fauziyah, S.Pd., M. Pd.

The first step taken by the lecturer model was to deliver the learning objectives. Then lecturer model divided the students into 6 groups and **each group change the seating position, which at the previous meeting was in the back changed to sit in front.**

At the core activities of learning, the lecturer model did not explain the material like the previous meeting. Students were required to understand the definitions and example problems of high level derivatives and implicit derivative in the module by doing group discussion. At this third meeting students had begun to be trained to independently learn the materials, the lecturer model only gave an explanation when the student asked.

Furthermore lecturer model shared LKM 1 level 1, students doing group discussions to resolve it, then doing presentations and class discussions, it also happened for LKM 2 level 1 and 2. To speed up the process of presentation, the answers of LKM were written on wide cardboard / manila paper, so that when the presentation students just needed to put the paper on the board.

**At the time of class discussion students had begun to present the results of group discussions skillfully, other groups had also been able to respond to the results of the discussion well, exchanging arguments between groups had also begun to emerge. At this third learning activity, the students' activities had started to develop well, independent learning to understand the material had also begun to increase.**

Furthermore, the lecturer model along with the student concluded the material that has been studied and students were given referral material for further study that was integral.

#### Reflections (*see 3*)

Reflection (*see 3*) began immediately after the completion of learning process, which was at 13:30 until 15:30. Lecturer model stated: (1) students had difficulties in completing the LKM, because they did not master the prerequisites material which was about derivatives (derivatives rules and basic), (2) the need to provide a lot of standard derivative exercise

problems to students so that students were more skilled in solving problems.

The solutions which had been found to solve the above problems were: (1) providing a lot of exercise problems that were given to students in regular lectures, (2) practice questions added to the module.

The results of this reflection became the basis to improve the next lesson *instruments* which were arranged for plan 4.

#### 4. Cycle 4

##### Planning (*plan 4*)

Plan 4 activities held on Tuesday, May 21, 2013 at 14:00 until 16:00 in the LS.

The result of the plan 4 were (1) the material used in preparing lesson plan was integral in the completion of the application of broad plains and the volume of the turning objects. (2) Fixing module / instructional materials by adding illustrations of curve clearly which shows the area that were calculated, (3) developing LKM 1 level 1 and 2 and LKM 2 level 1 and 2, (4) organizing the material in the form of *power point*.

##### Implementation (*do 4*)

Activities *do 4* held on Tuesday, June 13, 2013 at 10:30 until 13:00 in room D3.16. Lecturer model of the implementation of *do 4* was Midjan, S.Pd., M. Pd.

The first step taken by the lecturer model was to deliver learning objectives, and lecturer model divided the students into 6 groups. At the core learning activities, the lecturer explained the stages to calculate the area of a curve by using the integral. **At the time of this learning process students became more active to ask either about the curve and the way of integration if the area under the  $x$ -axis as well as if there were two areas that overlap each other.**

After the class discussed with lecturer model as the facilitator, then the lecturer model shared LKM 1 level 1 and 2, the students doing group discussions to resolve it, then presentations and class discussions were done as well as for LKM 2 level 1 and 2. To speed up the process of presentation, the answers of LKM were written on cardboard / manila papers, so that when they did the presentation they just put the papers on the board, it's just that the writing on manila paper was too small so that students sitting in the back could not read it clearly.

**At the time of the students doing group discussions, each group member was active and the representatives of groups were able to present their discussions skillfully, other groups had also been able to respond to the results of the discussion well, exchanging**

**arguments between groups had begun to emerge. In this fourth learning process, the activity of students in the learning process has begun to increase, independent learning to understand the material and LKMs had also begun to rise.**



Figure 2. Students interacting with lecturer model (top) and students doing presentations (batton)

Furthermore, the lecturer model along with the student concluded the material which has been studied and students were given an instruction for further study which was the integral to calculate the surface area of the tube.

##### Reflections (*see 4*)

Reflection (*see 4*) held immediately after the completion of learning activities, which was at 14.00 till 15.30. The results of the discussions in the *see 4* were (1) Observers were emphasized for observing students not lecturer model, (2) the creativity of students was raised, (3) Utilizing IT in the learning process such as using softwares (matlab, maple, derive), (4) further emphasize was in the learning process to provide habituation to the students to find a formula to analyze the theorems.

#### 5. Data of Students' Activities in Learning Process

The Data based on the observation of the students' activities in the learning process started from cycle 1 to cycle 4 was as follows:

Table 1. Data of students activities in LKM discussion of cycle 1

No.	Activity	LKM 1		LKM 2	
		Level 1	Level 2	Level 1	Level 2
1	The number of students in each group who work together to complete the LKM	2	2	3	4
2	The ability of students to present the results of the discussion	Poorly	Poorly	Poorly	Poorly
3	The number of groups that responded to the results of the presentations	2	1	2	2
4	Timeliness in collecting LKM	Not the right time	Not the right time	Not the right time	Not the right time

Table 2. Data of students activities in LKM discussion of cycle 2

No.	Activity	LKM 1		LKM 2	
		Level 1	Level 2	Level 1	Level 2
1	The number of students in each group who work together to complete the LKM	6.	6.	5	6.
2	The ability of students to present the results of the discussion	Poorly	Poorly	Poorly	Poorly
3	The number of students who responded to the results of the presentations	2	3	2	1
4	Timeliness in collecting LKM	Timely	Not the right time	Not the right time	Not the right time

Table 3. Data of students activities in LKM discussion of cycle 3

No.	Activity	LKM 1		LKM 2	
		Level 1	Level 2	Level 1	Level 2
1	The number of students who work together to complete the LKM group	6.	7.	7.	7.
2	The ability of students to present the results of the discussion	Poorly	Poorly	Nice	Nice
3	The number of students who responded to the results of the presentations	3	2	3	2
4	Timeliness in collecting LKM	Timely	Timely	Timely	Timely

Table 4. Data of students activities in LKM discussion of cycle 4

No.	Activity	LKM 1		LKM 2	
		Level 1	Level 2	Level 1	Level 2
1	The number of students who work together to complete the LKM group	7.	7.	7.	7.
2	The ability of students to present the results of the discussion	Pretty good	Nice	Nice	Nice
3	The number of students who responded to the results of the presentations	4	3	2	3
4	Timeliness in collecting LKM	Timely	Timely	Timely	Timely

Ket:

Ability	Poorly	Pretty good	Nice
The ability of students to present the results of the discussion	Students simply read the answers on the LKM and could not explain if there was another group who gave responses	Students explain the answer on the LKM, but were not able to explain if there was another group who gave responses	Students explain the answer on the LKM and can explain if there was another group who gave responses

### Conclusion

Based on the data obtained and the results of the discussion in the implementation of *lesson study* for Calculus 1 in Mathematics Education of FKIP Muhammadiyah University of Gresik, it can be concluded that the *Leveling Student Worksheet* strategy can enhance the activity of students in learning and have an impact on the growth of thinking and communication skills.

### Suggestion

Based on the results obtained from the implementation of *lesson study* for Calculus 1 which can be perceived directly for students and teachers, the authors suggest to apply *the lesson study* for other courses so that the quality of learning process in Mathematics Education Study Program, Muhammadiyah University of Gresik can be improved.

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## Algebraic Manipulation

Annabel Ho, Elaine Chua, Kerry He, Yeo Li Shan, Yong Jui Jin

**Abstract:** Research has shown that both virtual and physical manipulatives are effective learning tools for students in Algebra. The purpose of this study was to evaluate whether the use of virtual (Algetools) or physical manipulatives (Algediscs) enabled students to grasp the concept of Algebra. This study was based on a group of 19 students from Secondary 1 Normal Academic. In the first part of the study, students were taught to simplify algebraic expressions through the use of Algediscs. However, it was found that there was no significant difference in students' learning using only the physical manipulatives. Hence the team decided to examine if the use of Algetools enhanced students' learning in Algebra. Results from the pre and post-test measures showed that use of Algetools was effective in helping students better understanding the topic on solving algebraic equations. The exposure to the use of online manipulatives, Algetools, allowed them to translate from concrete to abstract representations more easily.



## 1. INTRODUCTION

According to the Secondary Mathematics Syllabuses (2006), Mathematics is ‘an excellent vehicle for development and improvement of a person’s intellectual competence in logical reasoning, spatial visualisation, analysis and abstract thought’. Mathematics develops students’ numeracy, reasoning, thinking skills, and problem solving skills. The emphasis on mathematics education will help gear students to be effective problem solvers and prepare students adequately to meet the challenges of the 21st century. The syllabus emphasizes the need for students to be provided with a variety of learning experiences.

Since algebra is an important milestone in secondary education, there is a need to ensure that students master it well. Algebra, however, pose a major challenge to students. Wong and Lee (2009) shared that the “concrete-representational- abstract” (CRA) three stage framework is listed as a key component of the Singapore Mathematics curriculum. Indeed, many students have difficulties transiting from arithmetic to algebra with its symbolism, equation solving and emphasis on relationships among quantities (Suh & Moyer, 2007).

To provide for students’ learning experiences, the use of manipulatives (concrete materials), practical work, and use of technological aid are used. Indeed research has highlighted the benefits of using manipulatives. The use of visual tools and manipulatives for algebra allows students to ‘internalise a visual language and develop habits of mind that will serve them well in high school’ (Gay & Velez, 2001) and promote students’ relational thinking (Greenes and Findell, 1999, Balka (1993). The use of manipulatives allows for a concrete representation of algebra, making it simpler for some students to understand than a symbolic model. (Bruner (1966), Goracke (2009)). Getting students to restate problems using their own words, draw diagrams to illustrate problems, or act out problems are ways students can demonstrate their ability to provide a concrete representation.

Online learning tools are defined as “computer based renditions of common mathematics manipulatives and tools” (Dorward, 2002, p.329) and provide “an interactive, Web-based visual representation of a dynamic object that presents opportunities for constructing mathematical knowledge” (Moyer, Bolyard, & Spikell, 2002, p. 373). NCTM (2000) stated that

“work with virtual manipulatives can allow young children to extend physical experience and to develop an initial understanding of sophisticated ideas like the use of algorithms”. The use of instructional software in Mathematics generally have a positive effect on student achievement in comparison to those without. (Final Report of the National Mathematics Advisory Panel, 2008).

However, Kaput (1989) cautioned that the connection between the use of manipulatives and understanding of algebra may not be automatic. Other research also warn about the possible dangers of using manipulatives when they are regarded as ‘play time activities’ (McNeil and Jarvin (2007) and ‘fun excursions’ (Moyer (2001), limiting the effect of manipulatives as a useful learning tool in Mathematics. Hence, effort and thinking should be given when designing the learning activities (Secondary Mathematics Syllabuses (2006)).

## 2. STUDY APPROACH

Using the MOE Mathematics framework as our basis, our research theme will be based on applying mathematics concepts in algebra. The objectives of the lesson study were to solve algebraic equations involving brackets using knowledge acquired in real numbers, simplification of algebraic expressions using direct teaching, manipulatives such as Algediscs and virtual manipulatives such as Algetools. This, too, allows students to engage in learning experience, aligning our lesson study to the new secondary Mathematics syllabus.

The initial discussion started off with the team consensus that algebra is one of the most important topics and most students were conceptually weak in it. Misconceptions were especially common when students learn algebraic simplification and solving of algebraic equations involving brackets. If these misconceptions are not addressed, these students continue to bring with them the common errors and tend to feel demoralised, even at the upper secondary level. In order to close this gap, the lesson study will be designed to scaffold students’ learning in Algebra. The target group of our research lesson was a group of 19 students from Secondary 1 Normal Academic. Students were taught using worksheets, demonstrations and with the use of manipulatives and ICT.

## 3. FINDINGS AND DISCUSSION



### 3.1 Lesson Study Cycle 1

After sharing the ideas members have in the teaching and learning of algebra, the team agreed to the use of Algediscs for the teaching of simplifying algebraic expressions. This part of the lesson aims at enhancing students' understanding of negative algebraic expressions. The use of manipulative allows students to bridge the gap from concrete and pictorial to abstract understanding. It allows them to explore the possibility of a unique understanding of a concept.

A pretest was given to both groups at the beginning of the research lesson based on Chapter 5 to test the homogeneity of the groups. After which, a posttest was then administered to both groups to test the difference in achievement levels.

### 3.2 Findings (Lesson Study Cycle 1)

The team collected and analyzed data from the pre and post-tests of lesson cycle 1 – simplifying linear expressions. A paired samples t-test revealed that the group did not show significant gains. These values are shown in Table 1. As these results indicate that the use of Algediscs are not significant in the achievement between the pre and post-test measures.

**Table 1.** A post lesson feedback survey was administered to capture the qualitative responses of students.

Statement	Percentage of students who agreed with the statement
The pace of the lesson was just right.	100.0%
I am confident enough to simplify algebraic expressions without the use of Algediscs	100.0%
I found the lesson fun and enjoyable.	94.7%
I think I can score well for this topic.	100.0%
During the lesson, I enjoy working in pairs.	88.2%
I work well with my friends	94.4%

Overall, the feedback provided by students with regard to the use of Algediscs for the lesson was encouraging and positive. Many students commented that the Algediscs has contributed positively to their learning. In addition, the majority of students also felt that working in pairs has helped enhance their learning experience.

### 3.3 Conclusion (Lesson Study Cycle 1)

The conclusions drawn from the lesson were that despite that the students enjoyed the lesson, they already had the necessary knowledge in using Algediscs to simplify algebraic expressions. Thus it did not enhance their learning. The group then came to a consensus to refine the lesson to using ICT-Algetools to solve algebraic equations.

### 3.4 Lesson Study Cycle 2

After which, another lesson was developed to teach students to solve linear algebraic equations. Making use of their knowledge of Algediscs, together with the use of Algetools, the next part of the lesson study was aimed at enhancing students' understanding of balancing the equation when solving. The Algetools provide a pictorial explanation of balancing the equation rather than the rote learning of moving terms in an equation.

The use of Algetools aims to enhance students understanding of solving algebraic equations through a balance. The manipulatives (Algediscs and Algediscs) provide a pictorial explanation of balancing the equation rather than using the rote learning of moving terms in an equation. At the same time, the lesson is such that students are expected to transfer the pictorial explanation into algebraic terms. This acts as a bridging tool.

Students are given opportunities to work in groups. This is in line with the learning outcomes of developing cooperative and confident learners. Through pair work, students question and reaffirm each other's responses and thinking. Team members were allocated to conduct observations during the lesson. The

#### Paired Samples Statistics

	Mean	No. of pupils	Standard Deviation	Standard Error Mean
Pre	5.81	16	2.073	0.518
Post	5.44	16	2.804	0.701

#### Paired Samples Correlations

	No. of pupils	Correlation	Significance
Pre & Post	16	0.692	0.003

#### Paired Samples Test

	Mean	SD	Std. Error Mean	95% CI Lower Upper	t	df	Sig. (2-tailed)
Pre & Post	0.375	2.028	0.507	0.756 1.256	0.739	15	0.471

#### Survey Results

main focus was to capture students’ conversations with the teacher and among the peers. Teachers then took the opportunity to highlight other common errors students may have in their learning.

The research lesson was based on solving algebraic equations involving brackets. A pre-test and post-test were administered to the group to test on the significant difference on the use of physical manipulative (Algediscs) and virtual manipulative through ICT (Algetools). At the same time, a post lesson feedback survey was administered to capture the qualitative responses of students.

### 3.5 Findings (Lesson study cycle 2)

The team collected and analyzed data from the pre and post-tests. A paired samples t-test revealed that the group showed significant gains from the research lesson. These values are shown in Table 3. As these results indicate, the use of ICT provided significant gains in achievement between the pre and post-test measures.

#### Paired Samples Statistics

	Mean	No. of pupils	Standard Deviation	Standard Error Mean
Pre	3.53	19	1.611	0.370
Post	4.38	19	1.344	0.313

#### Paired Samples Correlations

Pre & Post	No. of pupils	Correlation	Significance
	19	0.741	0.000

#### Paired Samples Test

	Mean	SD	Std. Error Mean	95% CI Lower Upper	t	df	Sig. (2-tailed)
Pre - Post	0.917	1.208	0.316	0.220 1.614	2.794	18	0.011

In addition to these overall results, the team also examined students’ perception of the use of ICT in learning. Table 4a shows the percentage of students who agree with the survey statements and table 4b shows the qualitative feedback from students.

#### Survey Results

Statement	Percentage of students who agreed with the statement
The pace of the lesson was just right.	78.9%
I am confident enough to solve algebraic equations without the use of Algetools.	100%
I found the lesson fun and enjoyable.	71.7%
I think I can score well for this topic.	89.5%
During the lesson, I enjoy working in pairs.	71.7%
I work well with my friends.	89.5%

#### Qualitative Feedback

Statement	Percentage of students who provided comments about lesson
Algetools help me understand the topic better.	26.3%
I liked the lesson.	47.4%
Working in pairs has helped me.	31.6%

### 4. CONCLUSION

This research shows how the use of ICT in teaching solving algebraic equations can contribute to student learning and promote relational thinking. Students’ exposure to online manipulatives allowed them to translate from concrete to abstract representations. The use of ICT helped to strengthen their developing understanding. The use of the tilting balance in Algetools promoted the understanding of equality in solving equations.

The teacher needs to take conscious effort in designing the learning activities. This is done through thinking through the lesson and providing scaffolding.

### 5. REFLECTIONS & LIMITATIONS

After going through the lesson study cycle, our group managed to pick up several salient from the process. For the topic on solving equations, we felt that our ICT lesson helped students reinforce the concept of “balancing the equation” by use of an actual animated beam balance shown on the screen.

However, our group also felt that we could have started the beam balance conceptualisation earlier for the students. For this current lesson study, students were exposed to the Algetools software after they already had knowledge of solving basic equations.

Because of this, we realised that a small group of higher ability students were less focused during the ICT lesson, mainly due to the fact that they had already mechanically mastered certain “shortcuts” that allowed them to find the

answer without going through the conceptually important “balancing” steps.

Hence, upon reflection, we noted that one of the areas of improvement could be to start with the “beam balance” conceptualization earlier where the class is at the exploratory stage of algebra, in conjunction with the Algetools software. This would then give our students a better foundation for understanding algebra before they are mechanically proficient in getting the correct numerical answers.

Another area which the group felt we could improve on was the students’ transition from using the software correctly to writing out the working on paper. Certain students were able to use the software to get to the desired solution, but when asked to solve a similar question on paper they were stuck and required assistance.

In order to help improve this in area, we thought about designing the worksheet and lesson such that this process becomes more guided for the students. One possible suggestion would for the teacher to help model the “screen – to-pen” transition where the teacher demonstrates to the class how and where each step in Algetools would correspond to a pen-and-paper working, with the students following the steps on their own worksheets. This method may also have the added advantage of appealing to kinesthetic learners as well.

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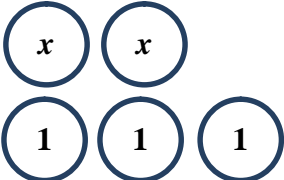
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<p>Checking understanding: If I have <math>(-x)(-x)(-x)(-x)(-x)</math>, what does this represent? [T to praise student if he is able to express it as <math>-5x</math> correctly.]</p> <p>Similarly when we add <math>-x</math> to <math>x</math>, we can make zero pairs. For example: <math>(-x)+(x)=0</math> Ie. <math>2x+(-2x)=0</math> <math>3x+(-3x)=0</math></p> <p><b><u>Adding and Subtracting Like and Unlike Terms – 15 mins</u></b></p> <p>In our previous lesson, we learnt how to add and subtract like terms. Today we include the use of Algediscs in our teaching and learning to help explain how to add and subtract algebraic expressions more clearly.</p> <p>When we have <math>2x + 3</math>, we represent it using</p>  <p>In pairs, students to express <math>y - 4</math> and <math>-x + 3y - 2</math> using the template and Algediscs provided for them. T to check answers with students.</p> <p>On your own, I would like you to draw discs to represent the algebraic expressions:</p> <ul style="list-style-type: none"> <li>• <math>6x + 2</math></li> <li>• <math>y - 5</math></li> <li>• <math>-2x - y - 1</math></li> </ul> <p>T to go through answers with students.</p> <p>In our previous lesson, we have also learnt how to simplify terms involving <math>x</math> and <math>y</math> by collecting like terms.</p>	<p><math>(-x)(-x)(-x)(-x)(-x)</math></p> <p>Students to say it is <math>-5x</math></p> <p>Students to use Algediscs to represent the expressions.</p> <p>Students to draw discs on handout.</p> <p>Students to draw discs</p>	<p>, then teacher re-explains concept of addition.</p> <p>Teacher to go through representation if students are unable to demonstrate; esp if students unable to show – representation.</p> <p><math>-2x</math> might be represented as <math>(-1)(-1)(x)</math> instead of <math>(-x)(-x)</math></p> <p>May attempt to draw out the sign in front of the <math>(x)(x)</math> to represent <math>-2x</math></p>
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	<p>on handout.</p>	<p>Solution is similar in that teacher to go through the representations again with the class.</p> <p>Teacher to remind students to adhere closely to the steps.</p>
<p>In pairs, students to simplify <math>-3x + 4y + 3x - 2y</math> using the template and Algediscs provided for them.</p> <p>Practice</p> <ol style="list-style-type: none"> <li><math>3y + 1 - 4y - 3</math></li> <li><math>-3y - 1 + 4y + 3</math></li> <li><math>4x - 5y + x + 2y - 1</math></li> </ol> <p><b>Quick Recap on Simplifying Negative Algebraic Expression – 20 mins</b></p> <p>Today, we are going to learn how to add and subtract linear expressions. Before we begin, let's recap what we did when we use Algediscs in Chapter 2.</p> <p>We represent 1 by <b>1</b> and -1 by <b>-1</b>.</p> <p>So 4 is represented by 4 ones in a bracket <math>(1, 1, 1, 1)</math> and <math>-(4)</math> means <math>-(1, 1, 1, 1)</math>.</p> <p>When that happens, all the numbers in the box becomes negative and we get <math>(-1, -1, -1, -1)</math>.</p> <p>Teacher to model the same for</p> <ol style="list-style-type: none"> <li><math>-(-4)</math></li> <li><math>-(2x + 4)</math></li> <li><math>-(x - 4y + 2)</math></li> </ol> <p>Teacher to also show the working version at the same time.</p> <p>Students to discuss with their partners the steps taken to simplify a negative algebraic expression.</p> <p><b>Addition and Subtraction of Linear Expressions – 20 mins</b></p> <p>Today we are going to learn how to simplify an algebraic expression. Teacher to model how the working should be presented as well.</p>	<p>Students to use template to simplify expression.</p>	



Ex: $-(2x-3y)-(2y-9)$	$=$		
Step 1 $= 2x + 3y + 2y + 9$	$=$		
Step 2 $= 2x + 5y + 9$	$=$		
Step 3 $= x + 7y$	$=$		

Students to work on 2 examples with the teacher and complete the other 4 examples on their own.

- $3x + 1 + (-x + 2)$
- $4y - 3 + (y - 1)$
- $-5x - y - 4 + (-3x - y - 1)$
- $(2x - 1) - (3x + 2)$
- $(2x + 5y - 6) - (2y + 3)$
- $(-4x + y - 5) - (-2x - y - 4)$

Students to discuss with their partners the steps taken to add/subtract an algebraic expression. Teacher to go through the steps with the students. T to recap learning objectives with students

**Homework**

Students to add/subtract 4 algebraic expressions on their own without the use of discs.

- a)  $(4a + b) + (3a - 6b)$
- b) Find the sum of  $5p - 4q + 7$  and  $p + 5q - 3$ .
- c)  $(7y - 2) - (4y - 9)$
- d)  $(2a - 3b) - (4a + b)$





**B. Worksheet for lesson study cycle 1**

Name: \_\_\_\_\_ ( )

Date: \_\_\_\_\_

Class: \_\_\_\_\_


**Broadrick Secondary School - Chapter 5 Algebraic Manipulation**

**Chapter 5.1: Like Terms and Unlike Terms**

**Using Algediscs**

We can use discs to represent algebraic expressions.

**Example 1**

$2x + 3$	
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Show how you would use discs to represent the following algebraic expressions below:

$y - 4$
$-x + 3y - 2$

**Practice 1**

Draw discs to illustrate the following algebraic expressions below:

$6x + 2$	
$y - 5$	
$-2x - y - 1$	



**Example 2**

We can simplify terms involving  $x$  and  $y$  by collecting like terms.

Working	Drawing
$2x + 3y - 5x + y$  $2x + 3y - 5x + y$ $= 2x - 5x + 3y + y$ $= \underline{\quad\quad} + \underline{\quad\quad}$	

Show how you would use discs to represent the following algebraic expressions below:

$$-3x + 4y + 3x - 2y$$

**Practice 2**

Draw discs to illustrate the simplification of algebraic expressions below:

Working	Drawing
$3y + 1 - 4y - 3$	
$-3y - 1 + 4y + 3$	
$4x - 5y + x + 2y - 1$	



## Quick Recap on Simplifying Negative Algebraic Expression

### Example 3

$-(4)$ $= -4$	$-( \textcircled{1} \textcircled{1} \textcircled{1} \textcircled{1} )$ $= \textcircled{-1} \textcircled{-1} \textcircled{-1} \textcircled{-1}$
$-(-4)$ $=$	$-( \textcircled{-1} \textcircled{-1} \textcircled{-1} \textcircled{-1} )$ $= \textcircled{\quad} \textcircled{\quad} \textcircled{\quad} \textcircled{\quad}$
$-(2x + 4)$ $=$	$-( \textcircled{x} \textcircled{x} \textcircled{1} \textcircled{1} \textcircled{1} \textcircled{1} )$ $= \textcircled{\quad} \textcircled{\quad} \textcircled{\quad} \textcircled{\quad} \textcircled{\quad} \textcircled{\quad}$
$-(x - 4y + 2)$ $=$	$-( \textcircled{x} \textcircled{-y} \textcircled{-y} \textcircled{-y} \textcircled{-y} \textcircled{1} \textcircled{1} )$ $= \textcircled{\quad} \textcircled{\quad} \textcircled{\quad} \textcircled{\quad} \textcircled{\quad} \textcircled{\quad} \textcircled{\quad}$



Pause & Think

Discuss with your partner the steps taken to **simplify a negative algebraic expression without the use of discs.**

- \_\_\_\_\_
- \_\_\_\_\_

## Chapter 5.2: Addition and Subtraction of Linear Expressions

What are Linear Expressions?

Algebraic expression like  $3n + 1$  and  $-2x + 5y - 4$  are called **linear expressions**. Each term has at most one variable to the power 1.  
We can add and subtract linear expressions by **removing brackets and collecting like terms**.



We can add and subtract algebraic expressions by collecting and simplifying like terms.

### Example 4

E.g.	$-(2x - 3y) + (4y + x)$	$- \left( \begin{array}{ccccc} \textcircled{x} & \textcircled{x} & \textcircled{-y} & \textcircled{-y} & \textcircled{-y} \end{array} \right)$ $+ \left( \begin{array}{ccccc} \textcircled{y} & \textcircled{y} & \textcircled{y} & \textcircled{y} & \textcircled{x} \end{array} \right)$
Step 1	$= -2x + 3y + 4y + x$	$= \begin{array}{ccccc} \textcircled{-x} & \textcircled{-x} & \textcircled{y} & \textcircled{y} & \textcircled{y} \\ \textcircled{y} & \textcircled{y} & \textcircled{y} & \textcircled{y} & \textcircled{x} \end{array}$
Step 2	$= -2x + x + 3y + 4y$	$= \begin{array}{ccccccc} \textcircled{-x} & \textcircled{-x} & \textcircled{x} & & & & \\ \textcircled{y} & \textcircled{y} & \textcircled{y} & \textcircled{y} & \textcircled{y} & \textcircled{y} & \textcircled{y} \end{array}$
Step 3	$= -x + 7y$	$= \begin{array}{ccccccc} \textcircled{-x} & & & & & & \\ \textcircled{y} & \textcircled{y} & \textcircled{y} & \textcircled{y} & \textcircled{y} & \textcircled{y} & \textcircled{y} \end{array}$

**Practice 4**

Using the templates provided for you, simplify the following algebraic expressions.

$3x + 1 + (-x + 2)$	
Step 1:	
Step 2:	
Step 3:	

$4y - 3 + (y - 1)$	
Step 1:	
Step 2:	
Step 3:	

$-5x - y - 4 + (-3x - y - 1)$	
Step 1:	
Step 2:	
Step 3:	



Pause and Think

Discuss with your partner the steps taken to **add algebraic expressions without the use of discs.**

1. \_\_\_\_\_  
\_\_\_\_\_
2. \_\_\_\_\_

$(2x - 1) - (3x + 2)$	
Step 1:	
Step 2:	
Step 3:	

$(2x + 5y - 6) - (2y + 3)$	
Step 1:	
Step 2:	
Step 3:	

$(-4x + y - 5) - (-2x - y - 4)$	
Step 1:	
Step 2:	
Step 3:	



Pause & Think

Discuss with your partner the steps taken to **subtract algebraic expressions without the use of discs.**

1. \_\_\_\_\_  
\_\_\_\_\_
2. \_\_\_\_\_  
\_\_\_\_\_



On My Own Questions

Simplify the following algebraic expressions without the use of discs.

a)  $(4a + b) + (3a - 6b)$

b) Find the sum of  $5p - 4q + 7$  and  $p + 5q - 3$ .

c)  $(7y - 2) - (4y - 9)$

d)  $(2a - 3b) - (4a + b)$



**C. Worksheet for lesson study cycle 2**

Name: \_\_\_\_\_ ( )      Class: \_\_\_\_\_      Date: \_\_\_\_\_

**Example 1**

$$3(3x) = 2(3x + 6)$$

**Guided Practice 1**

$$4(x + 1) = 3(2x + 5)$$

**On your Own 1**

$$2(5x) = 3(2x + 8)$$

**On your Own 2**





$$6(x + 2) = 2(2x - 8)$$

**On your Own 3**

$$5(x + 1) + 2(1 - 2x) = 0$$



Solve the following equations

1.  $7(x+2) = 2(2x+9)$

2.  $-2(3x-4) = 3(x-2)$

3.  $7-5(3x-4) = 3(x-2)$



**D. Pre and post-test for lesson study cycle 1**

**Chapter 5 Pre test**

Simplify	
<b>1</b>	$-3b + 7b =$
<b>2</b>	$5x + 2x - 9x =$
<b>3</b>	$-2q - 3q + 4q =$
<b>4</b>	$3y + 1 - 5y + 3 =$
<b>5</b>	$-4px + 2x - 9x + 6px =$
<b>6</b>	$2x^2 - 3x + 9x - x^2 =$
<b>7</b>	$-6 + 3m - 10m + 3 =$
<b>8</b>	$abc + 2bca - 3ac + 8ca =$
<b>9</b>	$\frac{2}{3}a + 2 - \frac{1}{2}a - \frac{1}{2} =$
<b>10</b>	$\frac{1}{3}a - b + 2 + \frac{1}{2}a - \frac{1}{2} - \frac{3}{2}b =$

**Chapter 5 Post test**

Simplify	
<b>1</b>	$-(-5x + 2x) =$
<b>2</b>	$-(3b + 7a - 2) =$
<b>3</b>	$(2a + 3b) + (4a - 7b) =$
<b>4</b>	$(3y + 1) - (5y + 3) =$
<b>5</b>	$(-4p + 2x) - (6p - 9x) =$
<b>6</b>	$4m - 2n + 1 - (-m - 2n + 3) =$
<b>7</b>	$-(-6 + 3m) + (10m - 3) =$
<b>8</b>	$3ac - (2ac - 1) + (-1 + ac) =$
<b>9</b>	$\left(\frac{2}{3}a + 2\right) - \left(\frac{1}{2}a - \frac{1}{2}\right) =$
<b>10</b>	$\left(\frac{1}{3}a - b + 2\right) + \left(\frac{1}{2}a - \frac{1}{2} - \frac{3}{2}b\right) =$

**E. Pre and post-test for lesson study cycle 2**

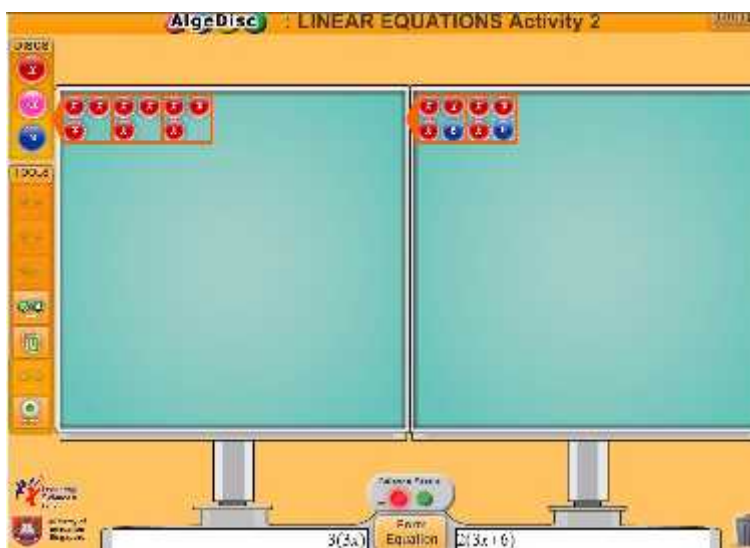
**Chapter 6 Pre test**

<b>1</b>	$a - 7 = 1$	<b>5</b>	$4 - 3f + 2 = 9$
<b>2</b>	$3b + 1 = 10$	<b>6</b>	$-3g + 4 = -5g + 8$
<b>3</b>	$\frac{1}{2}c - 2 = 0$	<b>7</b>	$3h + 5h - 1 = 4h + 7$
<b>4</b>	$1 - \frac{x}{5} = 2$	<b>8</b>	$-2k - 1 = 2k - 3$

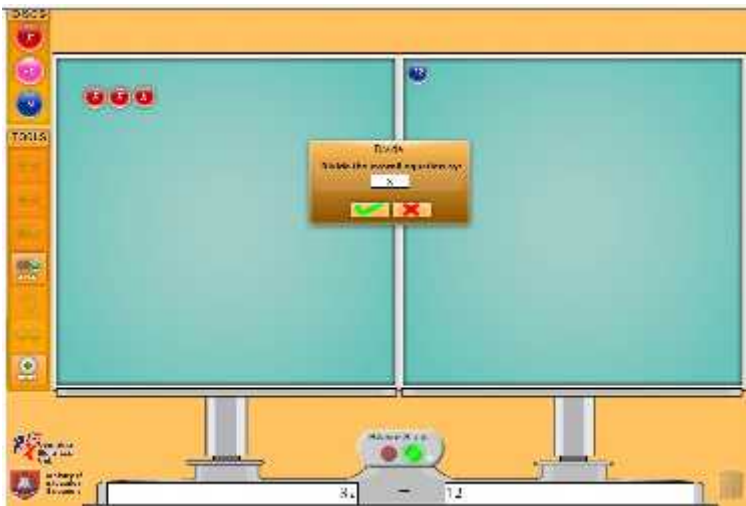
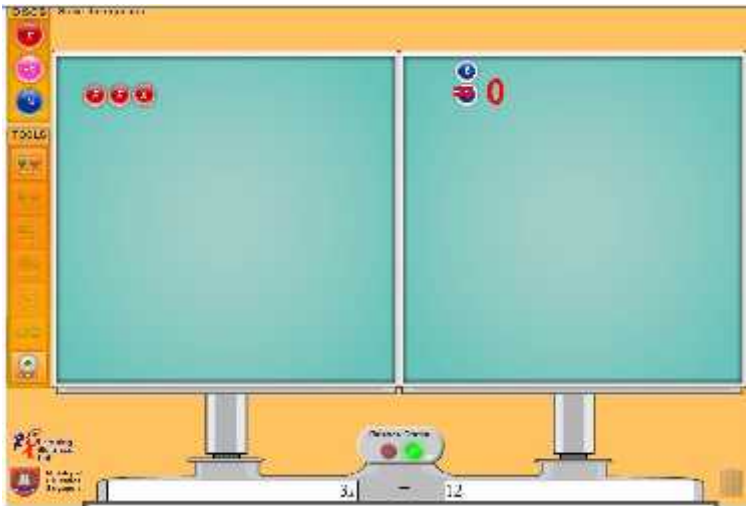
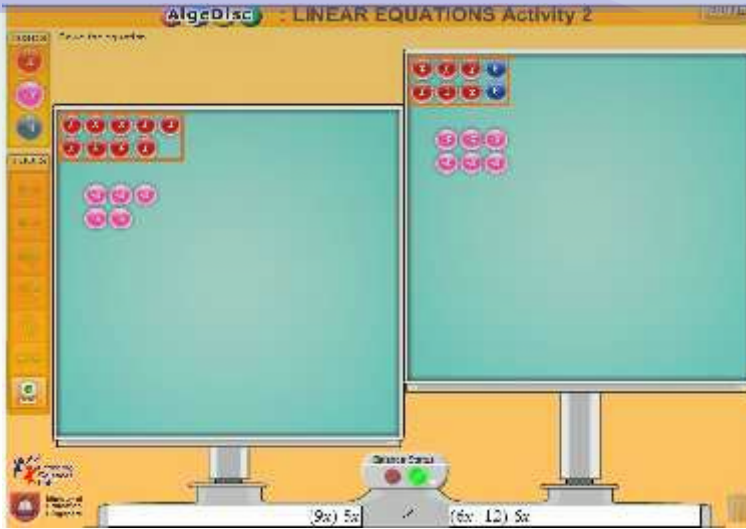
**Chapter 6 Post test**

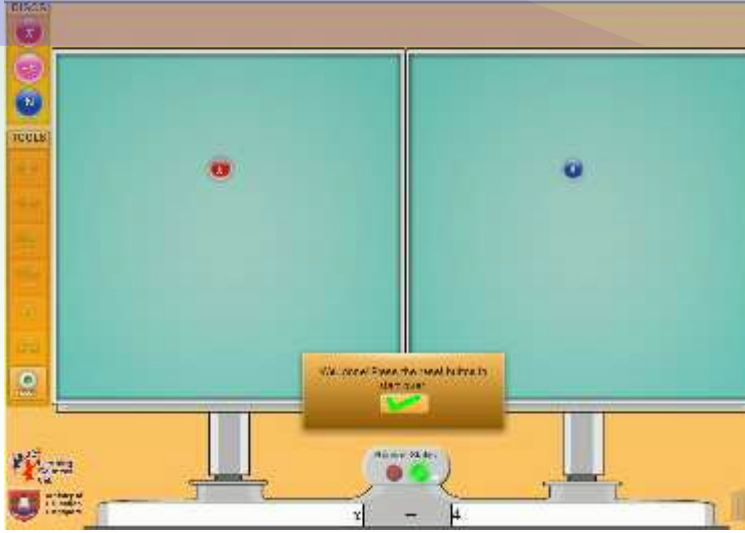
<b>1</b>	$2x - 4 = 3(1 - 2x)$	<b>5</b>	$4(-2x + 3) = 2(x - 2)$
<b>2</b>	$3(8 + 5x) = -12 + 3x$	<b>6</b>	$2(4x) - (-2x + 6) = 0$
<b>3</b>	$3(4y - 1) = 7(2y - 5)$	<b>7</b>	$\frac{y}{3} + 1 = y - 1$
<b>4</b>	$5(x + 3) - 4(x - 2) = 0$	<b>8</b>	$10(x - 2) = \frac{2}{3}(6x + 6)$

**F. Printscreen of Algetools**









**G. Observation Notes for Lesson Study Cycle 1**

	<b>GROUPWORK / Positive Interdependence</b>	Yes / No	DESCRIPTION OF OBSERVATIONS / EXAMPLES
	<b>Problem Solving Process</b>		
	Does the pair work cooperatively to solve the problem?	Yes	<p>Check each other’s answers and discuss if necessary</p> <p>Work on different brackets before grouping terms            Student 1: I don’t know how you are doing            Student 2: This is my way.</p>
	Does the pair encourage each other in their respective role to solve the problem?	Y	Healthy discussions and the checking of answers were observed.
	Does the pair understand the task?	Y	<p>Able to remove brackets and flip the signs</p> <p>Can do with and without the Algediscs</p>
		N	<p>Put all the terms into 1 brackets of the playing mat</p> <p>Use the operations symbol cards for the operations within brackets</p> <p>Brought down all the terms in the playing mat when removing brackets without changing signs</p>



	Is the pair engaged in the task?	Y	Every students was on task
	How do the students differentiate like and unlike terms? Are they able to differentiate them?		Use of disc allow students to differentiate easily Students can confidently collect like terms and simplify.
	Are the students able to group the terms and use zero pairs correctly?	Y N	Able to group terms $-5x-3x=-7x$
	How do the students treat negative variables in the expressions?(How do students remove brackets)		Simply flip the signs whenever there are brackets  1 student wrote ‘ $-(4x+5) = +4x - 5$ ’. Do not see the invisible ‘+’ before $4x$ , thus take it as ‘-’, and after flipping becomes ‘+’ Students represent the expression $-(-y)$ using Algediscs as Operation + variable $[-(-y)]$ rather than simply using 1 AlgeDisc $[(-y)]$ . For the question $x-3y$ , one group represented it using Algediscs as $(x)-(-y)(y)(y)$ .
	Do you observe a certain pattern that students have when they simplify the expression?		Follow the 3 steps (remove bracket, flip sign if necessary, simply)  1 student wrote ‘ $-(4x+1) = -4x + (-1)$ ’

	Do the students check their solutions after they have simplified the expression?	N	But a few do look back at the question to see if they obtained the same answer if they did it without discs
	Others		Insufficient Algediscs for teachers eh ‘y’

**H. Observations Notes for lesson study cycle 2**

	<b>GROUPWORK / Positive Interdependance</b>	Yes / No	DESCRIPTION OF OBSERVATIONS / EXAMPLES
	<b>Problem Solving Process</b>		
	Does the pair (if any) work cooperatively to solve the problem?	N  Y	Most of the pairs were focused on their own screens and only communicated when they needed technical help with the software. (JJ)  When faced with difficulty in entering the problem into the software, pair consultation was often seen.
	Does the pair/ student understand the task?	Y	Some can understand the use of Algetools to balance the equations and to form zero pairs.

	Is the pair/ student engaged in the task?	Y	Students were mostly engaged once the they could start the task.(JJ)
	Do students show that they are confident in removing brackets in grouping like terms in operations of real numbers	Y	Students were able to figure out the mathematical steps of the process even if they were not able to figure out how to use the Algetools software to demonstrate how.(JJ)
	Are the students able to group the terms and use zero pairs correctly? Do students use their prior knowledge in Real numbers to apply in solving algebraic equations?	Y	Students know how many ‘1s’ to add in order to form zero pairs.
	Are the students dependent on the Algedisc/ Algetools?	N	The students prefer their own method of “flipping” terms when moving them from one side of an equation to another.(JJ)

## Implementation of Lesson Study to Improve Competences of Lecturers

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**Abstract:**

Lesson study is a cycle in which teachers work together to consider their long-term goal for student, bring those goal to life in actual “research lessons”, and collaboratively observe, discuss, and refine the lesson. From the definition, detectable seven of number keyword which can be analogy as an impact the implementation this model to improve the lecturers competences (i.e. personality abilities, social abilities professional abilities, and pedagogical abilities). The seven of number keyword are professional development, learning investigate, collaborative, continuity, collegiality, mutual learning, and study community. The purpose of this research to know the implementation of lesson study to improve competences of lecturers. Research held at physics education department of STKIP Hamzanwadi Selong in the topic optic and classical mechanics. The result showed that implementation of lesson study can improve competences of lecturers, i.e personality abilities, social abilities, professional abilities, and pedagogical abilities. Based on these result can be conclude that the implementation of lesson study can improve competences of lecturers at physics education department of STKIP Hamzanwadi Selong. From the result of the open class, lecturer can review and improve quality learning and make an easy and a fun learning for student’s motivation. So the result of their learning can be increase. Implementation lesson study in each topic of lesson better to be developed lecturer to become professional lecture, and will give positive affect to world of university which is produced prospective teachers. Therefore, lecturers hopely do the lesson study continuously.

**Keyword :**

Lesson Study, Lecturer Personality Ability, Lecturer Social Ability, Lecturer Professional Ability, and Pedagogical Ability.

## 1. INTRODUCTION

The view that has lasted a long time that puts learning as a process of information transfer or the transfer of knowledge from faculty to students getting a lot of criticism. Placement of lecturers as the only source of information to make the student or students are not as dynamic individual, but rather as a passive object so that the potential keindividualannya can not develop optimally. This is not in accordance with the nature of education is to empower human effort. Humans are powerless is man who can think creatively, independent and that can establish itself and its people. Therefore, we need a new paradigm of learning.

Gordon (Aunurrahman, 2011: 4) states that the development of the students is a goal to be achieved by all colleges and lecturers, and that means very wrong if the lecturer is only responsible for delivering the material to the eyes. Development of potential college students in the learning process should be conducted a comprehensive and integrated. Development potential of students disproportionately in turn will make education tend to be more concerned with the development of certain aspects of personality, is particular and partial.

This phenomenon delivering the World Bank in 2005 to do research related to the ratio of access and quality of education in Indonesia. Produced that education in Indonesia only reached levels of thinking (cognitive) low, remember, understand, and apply, whereas for levels of high thinking like analyzing, evaluating and creating still very low.

The same problems facing education courses High School Mathematics Teaching and Education (STKIP) Hamzanwadi-Selong. The learning process that has been applied is still dominated by a model of learning that is based on the philosophy of behaviorism, which is centered learning lecturer (teacher-centered learning), based on the subject matter, and assessment in the form of paper and pencil tests conducted at the end of each subject, which is based on procedural results and understanding of the concept. It is seen from the Unit Class Events compiled by each lecturer. Strategies, methods and media that applied dominated by lectures, discussions, question and answer, and administration tasks. Likewise with the information obtained from the journal lectures. Teaching and learning activities are carried out during one semester dominated by discussions, questions and answers and lectures

Based on interviews with several student education department of physics STKIP Hamzanwadi-Selong, learning is dominated by discussions, divide the topic / sub-chapter discussion that will be compiled into a paper, then presented in

accordance with the serial number of groups that have been determined, and sometimes students were assigned to make resume if the meeting is less than it should. Of the studies that have been done, it appears that the contents of the paper presented a copy of the student group or copy and paste the material or opinions that exist on the Internet (download), without an opinion or analysis of the material or the opinion. According Kindvatter, et al, (Paul Suparno, 2007: 129) discussion method is a method of learning with group discussion that is instructive, reflective, structured and shared with other students. The point is a conversation, where students with student talks, the exchange of ideas and ideas with others. However, in practice, many students are not able to express ideas / basic critical thinking related to the material discussed. So the ability to think critically as analyze, create hypotheses, forming the synthesis and evaluation of information not honed and trained.

From the description of some of the problems faced physical education courses STKIP Hamzanwadi Selong, it can be concluded that the real subject matter rooted in agueness hierarchy teaching and learning processes implemented. Planning, implementation and reflection of teaching and learning process is never carried out continuously, collegiality and accountability. This is because in general the teachers prefer to work alone in preparing and carrying out the course. In addition, the faculty has not been fully aware of the competencies that must be owned and developed pedagogical competence, social competence, competence personalities and professional competence are implemented in research, teaching and community service

The low awareness of their competence and must be developed to make faculty generally have a high ego, feel super, do not easily accept input for improvement of lectures. Though there are no lectures perfect, there is always room for improvement. Therefore, the necessary reforms and improvements to the mindset of lecturers so that they can collaborate and want bersharing with other professors and lectures are open to improvement. Lesson Study is an alternative approach that is appropriate to improve the mindset of the faculty in the lecture.

Lesson Study is a model of professional development education through collaborative learning assessment and sustainable, based on the principles of collegiality of mutual help in learning to build a learning community. By implementing Lesson Study in learning, will be able to provide opportunities for teachers and lecturers for learning how to learn and learn about teaching and as a means to develop the competences of the lecturers.

## 2. METHODS

This study is an action that uses qualitative descriptive approach. The study was conducted in physics education courses STKIP Hamzanwadi Selong in 6 subjects are subjects magnetic electricity, electronics 2, 1 basic physics, thermodynamics, optics and mechanics 2. Subjects were first semester students on basic physics course 1, 3 semester students on the subject of electric magnet, 4th semester students on courses 2 electronics, thermodynamics, optics, and mechanics 2. The experiment was conducted in the first half and odd semester 2012/2013 and the 2013/2014 academic year. The instrument used in this study include (1) sheet enforceability of measures lesson study covering the planning, implementation and reflection, (2) learning observation sheet, (3) faculty competence assessment rubric contains aspects of the assessment as the indicators of pedagogical competence, competence indicator professional, social competence indicators and indicators of competence personalities during the stages of lesson study, and video recording stages of lesson study.

## 3. RESULTS AND DISCUSSION

In this study, the data obtained is the result of observation of the observer.

### 3.1 Ability Pedagogical of Lecturer

Lesson planning activities undertaken collaboratively to improve the quality of lecturers in preparing Unit Class Event (SAP) and also can improve the ability of pedagogical faculty. Pedagogic ability lecturer assessed at each open class activities by parfa observers were present through the assessment rubric pedagogical ability consisting of four aspects of assessment, namely open lessons, conducting core, assessment and reflection, as well as supporting factors include the use of language, timing, sense confidence and appearance. Here are the results of the assessment of the observers associated with the ability of pedagogical faculty in each course:

Table 1.1 Results of pedagogical capability assessment

course	Open Class	aspects of Assessment	score	Total Score
Listrik Magnet	I	Opens Learning	2	59
		Do	3	
		Assessment and reflection	2	
		Factor Investigations	2	
	II	Opens Learning	3	
		Do	3	
		Assessment and reflection	3	
		Factor Investigations	2	
	III	Opens Learning	4	
		Do	4	
		Assessment and reflection	3	
		Factor Investigations	3	
	IV	Opens Learning	4	
		Do	4	
		Assessment and reflection	4	
		Factor Investigations	3	
Elektronika II	I	Opens Learning	3	50
		Do	2	
		Assessment and reflection	3	
		Factor Investigations	3	
	II	Opens Learning	3	
		Do	3	
		Assessment and reflection	3	
		Factor Investigations	3	
	III	Opens Learning	4	
		Do	3	
		Assessment and reflection	3	
		Factor Investigations	3	
	IV	Opens Learning	4	
		Do	4	
		Assessment and reflection	3	
		Factor Investigations	3	
Fisika Dasar I	I	Opens Learning	3	52
		Do	3	
		Assessment and reflection	3	
		Factor Investigations	3	
	II	Opens Learning	3	
		Do	3	
		Assessment and reflection	3	
		Factor Investigations	3	
	III	Opens Learning	4	
		Do	3	
		Assessment and reflection	3	
		Factor Investigations	3	
	IV	Opens Learning	4	
		Do	4	
		Assessment and reflection	3	
		Factor Investigations	4	
Termodinamika	I	Opens Learning	3	60
		Do	3	
		Assessment and reflection	3	
		Factor Investigations	3	
	II	Opens Learning	4	
		Do	4	
		Assessment and reflection	4	
		Factor Investigations	4	
	III	Opens Learning	4	

		Do	4	
		Assessment and reflection	4	
		Factor Investigations	4	
	IV	Opens Learning	4	
		Do	4	
		Assessment and reflection	4	
		Factor Investigations	4	
Optika	I	Opens Learning	3	62
		Do	3	
		Assessment and reflection	4	
		Factor Investigations	4	
	II	Opens Learning	4	
		Do	4	
		Assessment and reflection	4	
		Factor Investigations	4	
	III	Opens Learning	4	
		Do	4	
		Assessment and reflection	4	
		Factor Investigations	4	
	IV	Opens Learning	4	
		Do	4	
		Assessment and reflection	4	
		Factor Investigations	4	
Mekanika II	I	Opens Learning	3	62
		Do	3	
		Assessment and reflection	4	
		Factor Investigations	4	
	II	Opens Learning	4	
		Do	4	
		Assessment and reflection	4	
		Factor Investigations	4	
	III	Opens Learning	4	
		Do	4	
		Assessment and reflection	4	
		Factor Investigations	4	
	IV	Opens Learning	4	
		Do	4	
		Assessment and reflection	4	
		Factor Investigations	4	

Some reasons lesson study can improve the ability of edagogic faculty is:

- Lesson study is an alternative method that can improve the quality of student learning membelajarkan and activities. This is because a) the development of lesson study conducted and based on the results of "sharing" which is based on professional knowledge and teaching practices are implemented on the lecturer; b) the emphasis fundamentally a lesson study is the quality of student learning; c) be a focus of learning objectives and the main focal point in the classroom; d) lesson study will put the role of the faculty as a researcher learning (Lewis, 2002 in Syamsuri 2008: 31).
- Lesson study designed properly will produce a professional and innovative faculty. By

implementing lesson study the lecturers can: a) determining the learning objectives (lessons) lesson plans, teaching methods are effective; b) to review and improve the useful lessons for students; c) deepen the knowledge of teaching materials presented lecturers; d) determine the long-term goals to be achieved student; e) plan lessons berkolaboratif; f) carefully assess student learning and behavior; g) develop reliable knowledge learning; and h) to reflect on the teaching that the implementation is based on the views of students and colleagues (Lewis, 2002 in Syamsuri 2008: 32), so that teachers can know the learning is done by reflection from the point of view of the observer and student to be able to do a better learning innovation.



### 3.2 Personality Ability Lecturer

indicator	aspects of Assessment	Visible	Unvisible
Acting in accordance with the norms of religion, law, social and national culture	Develop cooperation and foster solidarity with colleagues regardless of the differences that exist (eg, ethnicity, religion and gender)	✓	
	Mutual respect and appreciate peers in accordance with the conditions and the presence of each.	✓	
Showed that adult personality and exemplary	Behave decently in the talk, look and act towards all students, and peers.	✓	
	Want to share their experiences with friends	✓	
	Able to manage learning that prove that lecturers respected by his students, so that all faculty and students always pay attention to actively participate in every lesson.	✓	
	Mature way of receiving feedback from learners and give learners the opportunity to participate in the learning process.	✓	
Work ethic, high responsibility and are proud to be an advanced faculty	Start and end on time learning	✓	

### 3.3 Social Abilities Lecturer

Indicator	aspects of Assessment	Visible	Unvisible
Be inclusive, to act objectively, and not discriminatory	professors treat students fairly, provide care and assistance according to the needs of each, regardless of the personal factor	✓	
	lecturers maintain good relations with peers and caring, as well as contribute positively to all formal and informal discussions with his employment	✓	
Communication with fellow faculty, staff, students and community	To actively participate in learning activities organized outside the campus and the community and can provide proof of participation.	✓	

### 3.4 Lecturer Professional Competence

Indicator	Aspects of assesment	Visible	Unvisible
Mastery of the material, structure, concepts and scientific mindset that supports the course of teaching	Lecturer standard mapping and basic competencies for the course of teaching, to identify teaching materials that are considered difficult, doing the planning and implementation of learning and estimate the time required allocation	✓	
Developing professionalism through effective action	Specifically the self-evaluation, complete and supported with examples of their own experiences.	✓	
	Having a learning journal, record input from colleagues or learning assessment	✓	

	results as evidence that describes performance.		
	Doing research, community service, developing the work, innovation, following the seminar and actively carry out continuous professional development.	✓	
	Harnessing ICT to communicate and ongoing professional development.	✓	

Implementation of lesson study in each study looks capable of increasing the competence of lecturers. According Hendayana, S, et al (2007) stated that the lesson study is a model of professional development of educators through collaborative assessment and sustainable pembelajaran based on the principles of collegiality and mutual learning to construct a learning community.

Based on the experience of researchers, as PIC lesson study in the department of physical education STKIP Hamzanwadi Selong, it appears that the more activity sharing between lesson study groups in terms of preparing the lesson plan including the preparation of materials can increase the confidence in implementing learning activities. Of positive inputs given by the observer can motivate lecturers in order to improve the learning process and choose innovative methods for improving the quality of subsequent learning.

The positive impact of the implementation of lesson study to improve the competence of lecturers include: 1) the communication that exists between lecturers, the better. The phenomenon that often occurs is reluctance to collaborate in the design implementation of learning, so that social komepetensi will be understood and applied in the relationship between peers and the surrounding environment. 2) faculty will strive to plan the best possible learning, choosing an innovative method, and think about what would be the learning objectives will be achieved; 3) lesson study also lokakarya PLEASE 2013 di Sekolah Tinggi Theologi Aletheia

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forms an increasingly strong personalities. This is evident in the ability of faculty to respect each other and support each other to create a good learning process.

#### 4. CONCLUSION

Based on research carried out can be concluded that the implementation of lesson study in physics learning can improve the competence of faculty education courses physics STKIP Hamzanwadi Selong NTB.

#### 5. KNOWLEDGEMENTS

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## **Special Teacher For Special Children: *Perspective of Profesionalization Gifted Teacher***

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**Abstract:** Firstly, education for special teachers is prepared only for inclusion setting, so that special teachers are the ones with special skills to educate the special children in exclusion setting. Inclusive education, gives new perspective about the nature of human and education. The question concerning how the professional special teachers in the inclusion setting should be. Universal prevalence, recognize two stages of education pursued by each profession, which are the academic education and professional education. In special education profession, this issue is also prevalent. To become a professional special teacher, although special teacher have bachelor, magister, or even doctor degree as their qualification (academic), they have to take professional education. Grant research of Dikti (2008-2009) find special teacher's professionalization via special education scholarly was illustrated in pyramid competencies, that consists of common basic subject, specificity, and professional subject. However, there is a problem, because bachelor degree is only in academic program, not professional, so that the peak of the pyramid that is about professionalism is lost in the context, because it is more feasible in profession program. This condition is more complex if it is associated with specialization context. Meanwhile, the needs of special teacher in inclusion setting was raised and it is become an urgency to revise a curriculum at three universities (UPI, UNJ, and UNJ). As LPTK department of Special Education FIP UPI, disappointed to re-design academic education and professional education, so that both of them is appertain and obtain a professional special teacher. This paper is reviewing about how a special teacher is prepared with respect to conceptual, contextual, and the application. Although, the focus of this study is on gifted teacher that had been either in exclusion nor inclusion setting. The 2013' curriculum has actually already led to inclusion; that essence need to explain intelligently so that it can be meaningful.

**Keywords:** special teacher, specialization, exclusion setting, academic program, professionalism

## 1. INTRODUCTION

The Special Teacher study program that developed and established in a community in a certain period of time must also be influenced by a certain context as well. The perspective on education, learning, and teaching are the most important issues in planning and implementing the study program for Special Teacher. A research conducted by Multi Years—that is funded by foundation of DP2M —Dikti that uses Sandwich approach, resulted on obtaining the empirical model of the professional special teachers. This result makes new alternatives to the institution on preparing the candidates to become the special teachers (Yuyus, et al; 2008-2010). This result, however, shows that what has been prepared in the S1 (bachelor degree) program concerning profession of special teachers has been excessive, which means there should be reconsideration because it is necessary for the candidates to go through vocational (professional) department to become a professional special teacher. Thus, there should be the addition on professional portion for the students in the special education department in S1, S2, and S3—bachelor, master, or doctoral degree—so that the portion of time and the Chs will be more effective.

In historical perspective, the Special Teacher study program was firstly developed for the teachers that work in exclusive setting both in segregative and integrative. The inclusive education perspective, however, keeps developing and then raises the awareness that the general and special teachers need to have competence in this field. The effort to establish the competence is based on the definition on teachers’ skills concerning on how they behave in the class and construct a syllabus and another teaching plan that focus in specific competency. The community demand, the available resources, social expectancy, needs, teachers’ role, as well as the schools’ authority will influence the development of teacher program whether the institution has to emphasize on vocation or profession. Every orientation offers certain perspective concerning the preparation on becoming teachers. Special and general teacher education program contain all those aspects, but there are differences on the emphasis as well as the focus (Calderhead & Shorrock, 1997 in Johnsen & Skjorten, 2001).

Being a special teacher, then, becomes a teacher with special expertise (specialist teachers). A special teacher, are required to have expertise and specialized skills, have a strong loyalty and commitment to their profession, as well as guided by a clear discipline to the knowledge. Every individual who is a special teacher is required to work according to professional standards. According to the concept of profession, the standards of the profession can be identified to; has the function and

social significance; based him/herself on the expertise and specific skills; has a code of conduct that must be followed and avoid the violations of the profession in the code of ethic; and there are implications in the form of services provided in return. The complexity and scope of special education requires the special teachers to master the level of disciplines and knowledge in special education, and skills required to serve children with special needs adequately. For those reasons, it is a must that there should be the efforts of individuals and career development through professional education and academic.

The question that needs wondering is that how the teachers’ professionalism on special education can be achieved. A research conducted by Multi Years—that is funded by foundation of DP2M-Dikti (2008) reports that there is a need for extra special teachers whose expertise is on inclusive education setting that has been the prime attention in doing revision of the curriculum in the department of special education in UPI, UNJ, and UNY. The problem concerning the revision on curriculum in inclusive setting is regarded as a controversial issue. Based on the interview with the experts, there is a rumor on the experts that are included in the department of special education about whether the program has to be based on the classification of the specialty, inter specialty, or without any classification at all. The tendency that appears in the three universities (UPI, UNJ, and UNY), is that on the inter specialty and without any classification at all; still the specialty context in UPI is prevail.

The curriculum in the special education department in UPI, UNJ, and UNY are different, yet, substantially has the same passion to revise the curriculum. This is in accordance with the momentum of the education in this country that is festive on the teachers’ certification as the effort to enhance the professional teachers’ quality. This momentum is so important in the education in this country, more specifically to the universities that produce teachers as the outcome. The strategic effort that can be done is to enhance the teachers’ quality in several competencies, either academically or professionally. For those reasons, the redesign on the curriculum concerning the education of the special teacher’s candidates is important. One of the things that need attention is the shift from medical model to social model with philosophical inclusion that implicates in the grand design of preparing the special teachers.

In the context of preparing the special teachers, the maternal object in the special education is the individual special children anywhere they are. The special education in an axiological sense has the values as the knowledge that has to be honored in the professional ethics with three primary functions:



prevention, intervention, and compensatory. The discipline in special education has a complex field; for that reason, it is a need to collaborate with another disciplines to create the area of congruence, that has the focus on the obstacles to learn, the obstacle in develop, and the needs in the special education, rather than to the disabilities. Because of that, the area of congruence in the special education include the spectrum that describe the obstacles to learn, the obstacle in develop, and the needs in the special education. The complexity and the breadth of the area covered by the special education signifies that the teachers in special education have the competencies and knowledge in special education and the skills and expertise to adequately take care on the special children.

The special education, based on the philosophy of education, has already had the requirements of discipline of knowledge because it has the ontology, epistemology, and axiology aspects. Ontologically or by nature, the special education is needed because there are the special children that need helping. Epistemologically, special education has the methodology to analyze the formal and material objects. Methodologically, the development of the special education has its own methodology to do research. The special education has the formal object as the obstacle to learn, moreover, the development for the special children includes: 1) motoric perception and mobility; 2) social, emotional, and attitude; 3) interaction, language, and communication; 4) development on talent and creativity.

The professional model of special teachers can be developed through the figure training in the special education that is hoped to prepare the graduates to be a competent teacher. The curriculum in the department of special education needs to develop the pyramid of competence that implicates on the general and basic courses, the specific and basic courses, the specialized courses, and the professional training. The model of curriculum implementation in special education by applying Sandwich approach has essentially accepted by all the parties. Sandwich approach consists of four integrative continual levels. The students are prepared before the practicum; also the result of the practicum will be discussed with the lecturers. If it is not satisfactory, the practicum will be repeated; the students are prepared with new materials, and then they applied the materials, and then there will be reflections.

Along with the birth of law No. 14/2005 about teacher and lecturer; it writes that the candidates to be professional teachers are required to have the academic quality of S1/ D IV and graduated from teacher profession education. This policy is in accordance with the universal requirement that

require two kinds of educations that has to be passed through in every profession, which is the academic and profession education. Academic education is the education that develops academic competences to master the foundation of education concerning the profession of teacher and ends up in the achievement of academic qualification that is embodied as the bachelor degree. While professional education is the formation and development of professional education tips through the application of academic competencies and the real practice. Academic education specializes to the theoretical field while professional education specializes to the application field.

The special teachers are required to be able to translate the complex ideas of the topic being discussed to be an easy-learned material. Some of the knowledge that have to be mastered are: content knowledge, pedagogical knowledge, teaching skills, and etc. the high expectancy on the special teachers in the one hand is the achievement, but in the other hand is the challenge to enhance the quality. From the aspect of quality, it is widely known that most of the special teachers have not fulfilled the minimum standard demanded by the community.

The fact that there are still the incompetent special teachers raised the question on how the education is held for these times. If we made the analogy with the profession as being a doctor, it can be imagined that there are many people who die because of the wrong hand of the incompetent doctors? How many special children who have not optimally developed because the teachers are incompetent? If the teachers are incompetent; how about the universities that educate those particular teachers?

## **2. Perspective of Teachers' Professionalism Gifted and Talented Children**

The concept about talented keeps changing dynamically, this implicates on the definition of gifted & talented children. The term of gifted and talented children are usually used by the academicians. The use of gifted & talented terminology is based on the perspective of its development. Moreover, this definition and terminology also depend on the context of the children. Other terminologies that are used sporadically are: CI+BI; genius; brilliant; excellent; bright; superior; and etc. This phenomena shows that there has not a consensus regarding the talented children. Whereas, the identification method and the education of the talented children depend substantially on the definition (Davis & Rimm,1998).

Another important thing that still debatable related to who or what special teacher that will be assigning to take care the talented children. Should it be that the special teacher literally special too. What competencies should be mastered by the special teachers so that they can take care the talented children. Those are the never ending debate, yet worth thinking. The essence is there in the context of professionalism. So the questions concerning the special teachers should be answered by facilitating the special teachers to become professional by education; this is what we called professionalism.

The particular attention to the context of professionalism should be alluded to the matter of how the special teachers are prepared to take care the talented children. This is a must since the special and talented children in the special schools need the professional teachers. The teachers decided the objective of the study, help to develop the values in the mind of the special and talented children, decide what lesson to be experienced by the special and talented children, decide the method and strategy in teaching and become the model to behave. Mandell and Fiscus (Sisk, 1987) reports that the talented children can react negatively as they express anger, contempt, or dejection if they are stress.

Davis (Sisk,1987) states the characteristics of the talented children as follow: democratic; kind and shares personal sympathy; patient; interested on many things; nice appearance; just; unbiased; humorous; consistent behavior; empathy; flexible; complimentary; and has mastery in certain subject. While according to Makert (1982), the special teacher has to be classified into three aspects: philosophy, professionalism; and personality.

The characteristics of philosophy is important since the way the special teacher teach can have the high impact on the approach they used to teach the talented children. If the special teacher sees the talented children as having a high intellectual ability, there will be more emphasize on giving assignments, creativity, and high achievement. The special teacher will approach the talented children by focusing on power and depending on the books and materials. In contrast, the special teacher that sees talented children in term of the strengths and the weaknesses will apply the personal approach on the talented children.

Strom (1983) states the philosophical conflicts that can be experienced by the special teachers of the talented children. The special teacher tends to think that the talented children can be success on their own so the teachers do not need to give personal attention to the talented children. Sometimes, the special teachers think that as long as the talented children get the high score and do not cause any trouble in class, they do not need to consider the other things

but the academic requirements. The impact of these kinds of attitudes resulted that the talented children perform below their competence. They should have been better than that.

According to Wellborn (Sisk,1987) the special teachers may face philosophical difficulties in developing children's creativity in the classroom. Many of talented children report that they are humiliated and find the subjects are not challenging at all. Plowman (Sisk,1987) differentiates ten different characteristics of the professional special teachers to take care the talented children, which are: a) they asses the talented children; b) they know the personality and the need of the talented children; c) they use the assessment data to make a program that applied differently to every talented children; d) they know the model of the curriculum that is important for the talented children's education; e) they are capable to think and utilize the group dynamic; f) they know many programs that can be applied to the talented children and also the interest and commitment to the learning process of the talented children; g) they know the rules and punishment with respect to the education of the talented children; h) they know and can guide the talented children as well as their parents; and i) they know the recent tendency and issues in the education of the talented children.

The personal characteristics of the special teachers for talented children include motivation, self-confidence, taste of humor, patience, wide interest, and flexibility. Lindsay (Sisk, 1987) concludes the characteristics of the special teachers who are successful in teaching the talented children include self-understanding and self-accepting, have the power of ego, have certain type of sensitivity and sympathy to others, have an above-average intellectual interest, and have the responsibility to what they do and the consequences they take. Other personal traits of the special teachers to the talented children are the empathy, embracing, originality, enthusiasm, and self-actualization. From those traits, like flexibility and originality, it is a must that the special teachers should be open-minded and have the creativity so that they can give a challenging and interesting impression on the talented children, not to mention their capability to develop the talented children's creativity as well.

Most of the programs about special teachers to talented children signify the competencies as follows: understand the personality and need of the talented children, have skills to develop the way of thinking, know the effective and cognitive needs of the talented children, have a creative problem-solving skill strategy, capable of using the learning strategy personally, have a master in proper teaching techniques for the talented children, capable of guiding and counseling to the talented children as



well as the parents, also have the ability to do research.

The presence of the academic and professional education raises the big agenda to do the redesign for the new curriculum for both of the educational systems. Above all, both of the two educational systems are so different in some ways. On the professional education, for example, there are still two ways which are PLPG and PPG (Training for Professional Teacher). Either PLPG or PPG need the curriculum that can embrace and develop the specific special education for it is comprehensively design and integrated for S1, S2, and S3 (Bachelor, master, and doctoral degree).

For these times, the objectives in the bachelor degree or S1 are to grasp the educational competency as the foundation of professionalism. Through lecturing, the students learn contextually as well as practically by internship, are hoped to be able to transfer the experience in learning to their way of thinking and attitude. The transfer process of learning is believed to be happen when the students: a) experience an activity in which there are conceptual elements inside; b) reflect the activity or listen to other reflecting their experiences in discussion and reflection; c) to abstract the practical knowledge ; and d) apply the result of the learning in the reality.

Reflecting on the assumptions and also the objective and the profile of the special teacher for the talented children, the management of the learning process in the classroom applies Sandwich approach. One thing that need to be emphasized is that the needs of the students who are the candidates of special teacher for the talented children to have the live experience in achieving and mastering the objectives of the study. The live experience is always related to the context of the talented children. From the institutional aspect, the approach of the basic curriculum as the part of the whole curriculum of the study program that initiate and are responsible for the developing the program to the institution. The challenge in this kind of program is the prerequisite of the competence development either in the sense of the resources or the personal continually. By extension, the students who are the candidate of the special teachers for the talented children should be assigned to compose their own syllabus which is the first basic step on the development of initiation and responsibility in learning for themselves as professionals.

Concerning to the relationship between the theory and the practice that can be done through multilevel approach which is continual and integrative (sandwich system), after certain stage is passed, there will be a chance for the students to practice again and then reflected again on the theory after the evaluation, it is continual. The briefing to

prepare the theoretical knowledge is done before the students are released to practice. The results of the practice then are analyzed, discussed, and then the supervisor (lecturer) does the debriefing. The materials for the discussion are used as a reflection in giving the new theory before the students are released to practice, and so it is for the next. The practice moves from simple to complex; from the orientation, the brief exercise, the complete exercise with supervising, until the students are left to teach by themselves.

Through the Sandwich approach, it is hoped that the transfer of the experiences in learning in the form of patterns of attitudes that are changeable. The transfer of knowledge is believed to be occurred when the students: a) experience an activity in which there are conceptual elements inside; b) reflect the activity or listen to other reflecting their experiences in discussion and reflection (debriefing) ; c) to abstract the practical knowledge ; and d) apply the result of the learning in the reality.

### 3. CONCLUSION

The presence of two stages in education that have to be passed in every profession, which are academic education and professional education triggers a research that focus on the possibilities of its development. Even though the curriculum in the Department of Special Education (UPI, UNJ, and UNY) is varied, substantially those curriculums have the spirit of innovation into inclusion. The structure of the curriculum in academic setting would rather be directed as a mosaic and continual elements which accommodate the future interest. So too with the curriculum in the professional setting, it is better if there is a redesign so there will be a proportional division, because in the bachelor degree or S1, the emphasis is on the preparation process to create the professional outcomes, especially with respect to the model of learning.

The professional model of special teachers for the talented children should be based on the reflection of the assumption, the program, and the profile as well as the objective of the special teacher for the talented children. For this reason, the thing that need emphasizing is the needs of the students who are the candidate of the special teachers for the talented children to have the live experience in achieving and mastering the knowledge that is targetted by the institution. The life experience is always related to the context of teaching the talented children. From the institutional aspect, the basic approach to curriculum as a part of the whole curriculum of a study program that put its initiative and responsible in developing the program to the institution. By extension, the students who are the candidate of the special teachers for the talented

children are responsible to advance their own knowledge in self-development as the professionals specialized for the talented children.

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## **Students’ Actional Competence Reflected through Genre: Transforming Narrative into Drama Script *A Descriptive Study on Grade VIII Students***

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**Abstract:** Teaching English in junior high school is directed to the development of students’ communicative competence. In oral practice, to reach this ultimate goal, one important aspect is that students have to understand the knowledge of language functions. Therefore, they are able to convey and understand communicative intent. This ability refers to actional competence, as a sub-component in communicative competence. Exposing students to the knowledge of language functions can be done through a Narrative text. To practice the students’ oral skill, the Narrative text is transformed into a drama script since it allows the creation of contexts for different language uses. This research is aimed at identifying the types of mood in the drama script and examining the language functions of the mood types in communication. It was done under discourse analysis by applying a descriptive qualitative method. Drama scripts made by class VIII students were selected to get the data by considering the internal features of the text such as syntax, lexical choice and organization. Then, the clauses in the drama script were analyzed to find out the mood and the language functions. The results show that students use declarative, interrogative, imperative, and minor clause of mood types to realized language functions in drama script. The students’ actional competence is shown by the use of various language functions in terms of interpersonal exchange, information, opinions, feelings, suasion, problems and future scenarios. Furthermore, those language functions can indicate the social roles of the characters and the relationship among the characters.

**Keywords:** Actional Competence, Narrative Text, Drama Script

## 1 INTRODUCTION

By learning English in junior high school, students are expected to be able to communicate in spoken and written forms, so to some extent, it enables students to develop communicative competence. Communicative competence is defined as the capacity to use language appropriately in communication based on the setting, the roles of the participants, and the nature of the transaction (Richards, 2002 in Celce-Murcia et al., 1995). The communicative competence model proposed by Celce-Murcia (2007) has six facets; Sociocultural Competence, Linguistic Competence, Formulaic Competence, Interactional Competence, and Strategic Competence. And Discourse Competence is at the core of this idea, and it is basically one's ability to put words into an understandable phrase or sentence. This integrative framework suggests that even with a good grammatical or structural knowledge of the language, students will not be competent in the language until they learn the cultural aspects and implications of the language. Furthermore, Celce-Murcia and Olshtain (2000: 16) note that the Interactional Competence is extremely important since the performance of speech acts or speech act sets can differ considerably from language to language. This competence includes actional, conversational, and non-verbal/paralinguistic competences.

In classroom practice, those competences are developed through exposure of genres. Gerot and Wignell (1995: 17) defines genre 'as a culturally specific text-type which results from using language (written and spoken) to (help) accomplish something.' They add that genres are usually associated with particular purposes, particular stages—distinctive beginning, middles, and ends—and particular linguistic features. Gerot and Wignell (1995: 226) note that in secondary education genres do not occur in isolation; different curriculum areas employ particular selections and patterns of genres. They do this because they are trying to achieve different things.

Narrative is one of genres taught to junior high school students. Reading a Narrative text allows students to deal with actual or imaginary experiences in different ways as the social function, to comprehend the generic structure and the lexicogrammatical features. Teaching Narrative can also be extended to oral activity that requires students to role play social interaction with various language functions. Drama can be an alternative of oral activity since it provides context for meaning negotiation. Transforming Narrative into drama script takes students' progress into consideration. The students' communicative competence can be

indicated by their ability to use different language functions in the given context. Therefore, the students' actional competence in writing drama script is worth analyzed. A further implication of teaching Narrative in speaking is the development of students' actional competence which is going to be the focus of this study. This study is conducted to find out (1) the types of mood in the drama script and (2) to examine the language functions of the mood types in communication.

## 2 REVIEW OF RELATED LITERATURE

### 2.1 Text Transformation Exercise

In language teaching, a particular genre can be used to teach different areas of knowledge and skill. For example, a tourist brochure about a medium-sized town can be given for reading and discussing tasks, and then using some or all of the information and ideas contained in the text to create and encyclopedia entry about the town. Caudery (1998) calls such kind of activity as text transformation exercise. He adds that one important factor is the ability to select appropriate content and language to suit the communicative task on hand. There are ranges of suitable choices that a writer or speaker should made in order to create texts for different occasions and purposes.

Text transformation exercise may include the following activities Caudery (1998: 5) :

- reading and understanding the source text,
- noting the genre of the source text, including the identification of the reader/writer relationship and the text purpose,
- noting the results of the generic factors on the content, organization, and language of the source text,
- identifying the genre of the new text, and deciding on how generic factors will affect content, organization, and language of the text,
- selecting relevant material from the source text, and
- using this material to write the new text, taking into account the decisions made about appropriate content, organization, and language.

In practice, these activities sharpen the students' awareness of the need to consider more than surface-level accuracy. They do not merely require knowledge telling but knowledge transforming which belongs to higher order skill (Bereiter and Scardamalia, in Caudery: 1998)

## 2.2 Narrative and Drama

Narrative is a text-type whose purpose is, according to Gerot and Wignell (1994: 204), to amuse, entertain, and to deal with actual or vicarious experience in different ways. Narratives deal with problematic events which lead to a crisis or turning point of some kind, which in turn finds a resolution. Some examples of Narrative are tales, legends, and myths.

Meanwhile, the term drama in education refers to what can be taught through drama in drama and certain subject like language (Savela, 2009: 4). Therefore, drama can be an alternative to teach Narrative. Narrative's generic structure like orientation, evaluation, complication, resolution, and re-orientation can be presented through action and dialogue of the characters involved. In this context, Zafeiriadou (2009: 4) considers drama as a creative process and an a challenge for creative thought. Zafeiriadou (2009: 6) also justifies drama in the language context as it offers some benefits as follows:

- a. Drama fosters and sustains learners' motivation as it is fun and entertaining, and because it engages feelings, it can provide a rich experience of language for the participants.
- b. Drama as a process is learner-centred because it can only operate through active cooperation.
- c. As a social activity, drama embodies social and communal, as opposed to the purely individual, aspects of learning.
- d. Being a collaborative and participatory teaching approach, it contributes positively to the development of the learners' self-esteem and self-efficacy.
- e. Drama allows the creation of contexts for different language uses, thus fostering learners' language awareness. In a dramatic situation, learners use language in a communicative way (taking turns, interacting verbally, using body movements, gestures and facial expression, listening actively).

Savela (2009: 3) also believes that drama activities have values that students can learn. They can increase students' self-esteem, language skills and their abilities to express themselves by using their own creativity. In addition, they can develop social skills and make the students attain more cultural knowledge in an interesting way through a dramatic context. Moreover, drama activities can bestow equally children and adults benefits that are required in real life.

Through drama, Savela (2009: 11) adds that students learn to use regular speech. Therefore, the division between the organized language inside a classroom and the spontaneous language in the real world will narrow. This is achieved due to drama

engaging students in authentic real life situations. It is supported by Pyörälä's study (in Savela, 2009: 14) that it was the improvisational nature of the activities and acting in role which brought the students the ability to use spontaneous speech. In addition, Pyörälä noted that the students were able to use their language skills within a context and produce more sufficient speech than they would have initially thought.

Moreover, Clipson-Boyles in Savela (2009: 11) and Yue Hu (2011: 4) share a similar view by stating that drama puts language into context and helps students to process new words or expressions in an appropriate context. Thus, when students are obliged to participate in meaningful activities and use English, they strive to use normal everyday speech. As a result, students speak in English in order to fulfill the assignments and inadvertently practice their language skills.

According to Schiller (in Yue Hu, 2011: 5), most drama leads young people to learn about social life actively, and it also fosters their conflict resolution abilities and improves human relations. Drama facilitates students to deeply understand themselves and others. They will compare the characters in the drama and their own life in reality, thus drama has the potential to change students' thinking to deal with interpersonal relationships. Gaudart (in Yue Hu, 2011: 5) claims drama makes students inevitably immersed in a social milieu and create more experience for students learning how to get along with other people. Drama stimulates students to come up with ideas and put them together. They work together to create the scenario with new characters. Thus, the value of drama lies in the creative process and its effective opportunity for working with others.

## 2.3 Model of Communicative Competence

In creating drama scenario, the students' ability to use language to communicate is required. Savignon (1971, in Savignon, 2002: 3) uses the term "communicative competence" to characterize the ability of classroom language learners to interact with other speakers, to make meaning, as distinct from their ability to recite dialogues or perform on discrete-point tests of grammatical knowledge. Savignon (in Omaggio, 1986: 4) emphasizes that communicative competence is a dynamic process that depends on the negotiation of meaning between two or more persons who share some knowledge of the language.

Celce-Murcia et al. (1995: 10) propose an integrative view of communicative competence with five major components: (1) linguistic competent, (2) strategic competence, (3)

sociocultural competence, (4) actional competence, and (5) discourse competence. In 2007, Celce-Murcia (in Flowerdew, 2013 :7) revised and updated the framework of communicative competence as shown by the following figure:

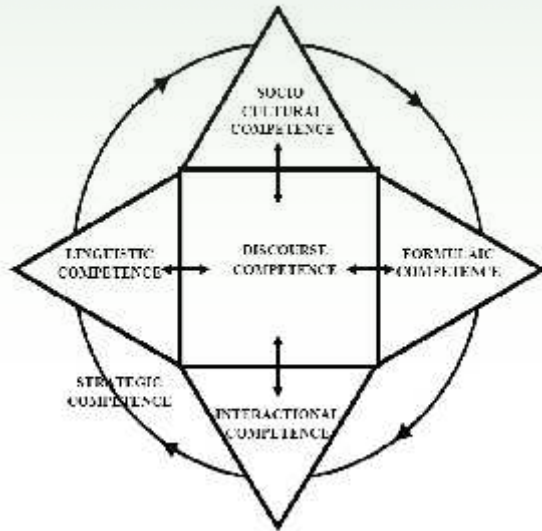


Figure 1. Schematic Representation of Communicative Competence

*Sociocultural competence* refers to the speaker's pragmatic knowledge which includes social contextual factors, such as the participants' age, gender, and status; stylistic appropriateness, such as politeness strategies; and cultural factors, including background knowledge about the target language group. *Linguistic competence* refers to knowledge and skill with regard to lexical items and rules of morphology, syntax, sentence grammar, syntax, and phonology. *Formulaic competence* is the counterpart to linguistic competence; it refers to the fixed, prefabricated chunks of language which do not behave in the generative way that grammatical items do. *Interactional competence* includes actional competence (the ability to perform speech acts) and conversational competence (the ability to operate the turn-taking system of conversation). *Strategic competence* consists of strategies for language learning or maintaining the flow of interaction. And the central role/controlling competence is *discourse competence* which refers to the selection, sequencing and arrangement of words, structures, and utterances to achieve a unified spoken message.

## 2.4 Actional Competence

Interactional competence is the bottom-up component that at least has three sub-components (Celce Murcia, 2007 in Flowerdew, 2013):

(1) *Actional Competence*: knowledge of how to perform common Speech Acts and Speech Act Sets in the target language involving interactions such as information exchanges, interpersonal exchanges, expression of opinions and feelings, etc.

(2) *Conversational Competence*: It consists of skills like opening and closing conversation, changing topics in conversation, etc.

(3) *Non-verbal/paralinguistic Competence* includes the kinesics behaviour, proxemics, haptic behaviour and non-linguistic utterances with interactional import.

Celce-Murcia et al. (1995) define actional competence as competence in conveying and understanding communicative intent, that is, matching actional intent with linguistic form based on the knowledge of inventory of verbal schemata that carry illocutionary force (speech acts and speech act sets). In addition, they noted that this conceptualization of actional competence is mainly restricted to oral communication.

The components of actional competence suggested by Celce-Murcia et al. (1995) are as follows:

### A. Knowledge of language functions

#### 1. Interpersonal exchange

- Greeting and leavetaking
- Making introductions, identifying oneself
- Extending, accepting and declining invitations and offers
- Making and breaking engagements
- Expressing and acknowledging gratitude
- Complimenting and congratulating
- Reacting to the interlocutor's speech: showing attention, interest, surprise, sympathy, happiness, disbelief, disappointment.

#### 2. Information

- Asking for and giving information
- Reporting (describing and narrating)
- Remembering
- Explaining and discussing

#### 3. Opinions

- Expressing and finding out about opinions and attitudes
- Agreeing and disagreeing
- Approving and disapproving
- Showing satisfaction and dissatisfaction

#### 4. Feelings

- Expressing and finding out about feelings: love, happiness, sadness, pleasure, anxiety, anger, embarrassment, pain, relief, fear, annoyance, surprise, etc.

#### 5. Suasion

- Suggesting, requesting and instructing

- Giving orders, advising and warning
  - Persuading, encouraging and discouraging
  - Asking for, granting and withholding permission
6. Problems
- Complaining and criticizing
  - Blaming and accusing
  - Admitting and denying
  - Regretting
  - Apologizing and forgiving
7. Future scenarios
- Expressing and finding out about wishes, hopes, and desires
  - Expressing and eliciting plans, goals, and intentions
  - Promising
  - Predicting and speculating
  - Discussing possibilities and capabilities of doing something.

#### B. Knowledge of speech act sets

In order to be able to use language functions in context, language learners need to be familiar with how speech acts are integrated into the higher levels of the communication system. For instance, the utterance “You look great today” serve not only as a description but functions mainly as a compliment and as such fulfills a social function. Social actions performed via utterances are what Celce-Murcia and Olshtain (2000: 24) called as speech acts.

### 3 METHODOLOGY

For the purpose of this study, only knowledge of language functions is analyzed which is realized by moves. A move is a unit after which speaker change could occur without turn transfer being seen an interruption and a move itself, most of the time, is realized by clauses (Eggins and Slade, 1997: 186).

Total of four drama scripts written by junior high school students of grade eight were selected. The selection was done by considering the contents in terms of the internal features of the text such as syntax, lexical choice and organization. Then, one script was analyzed to get the data. There are six roles in the script; one narrator and five characters. For the purpose of this study the dialogs among five characters were analyzed and the narrator’s part was left unanalyzed since it does not reflect the speaker’s personal feelings. The unit of analysis is move in the characters’ dialog.

In order to find out the students’ actional competence in role play exercise, a three-stage task was devised. In the first stage, the students were

required to read a Narrative entitled “The Golden Snail”. Next they were required to work in groups of six to create a drama from the narrative consisting of a narrator and five characters. The third stage was performing the drama by having role play representing the characters that each student had chosen.

Since this study is to find out mood types and their language functions, only the results of the second stage were employed as the data. First, the drama script was segmented into single turn and move to identify the mood types. Second, the language functions of the moves are examined based on the given context. Then, the final step is drawing conclusions.

### 4 FINDINGS AND DISCUSSION

The drama script is presented in eight scenes, so the analysis is conducted based on the sequence of the scenes. The narration on the scenes are presented to as originally taken from the script to provide context of the exchanges. There are five characters introduced in the drama namely Dewi Sekartaji, The King, The God Narada, Mbok Rondo, and Panji

Asmoro

Bangun.

Turn no	Speaker	Move	Mood (Clause Type)	Language Function
1	Dewi Sekartaji	(i)Why... do you love me.	-	(singing-starting a scene)
2	The King	(i)Ehm ... wow ... your voice is beautiful like your face. (ii)May I know you?	Declarative: full Modalized Interrogative: full	Complimenting Making introduction
3	Dewi Sekartaji	(i)Of Course. (ii)My name is Dewi Sekartaji.	Minor Declarative: full	Showing attention Identifying oneself
4	The King	(i>Your name is beautiful.	Declarative: full	Complimenting
5	Dewi Sekartaji	(i)Oh thank you.	Declarative: elliptical	Expressing gratitude
6	The King	(i)I love you Dewi Sekartaji. (ii)You are a perfect woman. (iii)May I marry you, please?	Declarative: full Declarative: full Modulated Interrogative: full	Expressing love Complimenting Requesting
7	Dewi Sekartaji	(i)I am sorry (ii)because I am married.	Declarative: full Declarative: full	Discouraging
8	The King	(i)Who is your husband?	Wh-Interrogative: full	Asking for information
9	Dewi Sekartaji	(i)My husband is Panji Asmoro Bangun.	Declarative: full	Identifying oneself
10	The King	(i)I do not care. (ii)You must marry me.	Declarative: full Modulated Declarative: full	Denying Instructing
11	Dewi Sekartaji	(i)Oh <i>can't</i> like that.	Declarative: elliptical	Disagreeing

The interaction in Scene 1 is dominated by declaratives to develop interpersonal exchanges like complimenting, identifying oneself, and expressing gratitude. The introduction of the characters is started by The King's moves by complimenting and making introduction using modalized interrogative. This mood choice sounds polite to seek Dewi's attention and is responded by declarative to identify herself. Two other moves of complimenting ('Your name is beautiful' and 'You are a perfect woman') are produced by The King to sustain the attention.

The declarative move of expressing love shows how The King wants to build a relationship with Dewi and is confirmed by requesting 'May I marry you, please?'. However, this modulated interrogative seems inappropriate since it tends to show probability instead of inclination of how Dewi is willing to marry The King. A response of discouraging is given by Dewi by saying that she was married which is actually to decline The King's proposal. The next moves show how the two characters contradict each other in this case.

Table 2. Mood types and language functions in Scene 2

Scene 2: The King kidnapped Dewi Sekartaji but when he kidnapped Dewi Sekartaji, suddenly Narada came.

Turn no	Speaker	Move	Mood (Clause Type)	Language Function
12	The God Narada	(i)Why do you cry? (ii)What happen with you?	Wh-Interrogative: full Wh-Interrogative: full	Finding out about sadness Finding out about sadness
13	Dewi Sekartaji	(i)The king kidnapped me. (ii)I must marry him but  (iii) I don't love him and (iv) I am married to Panji Asmoro Bangun. (v) Can you help me?  (iv) I want to be free from here and (v)I want to meet my husband.	Declarative: full Modulated Declarative: full Declarative: full Declarative: full  Modulated Interrogative: full Declarative: full Declarative: full	Narrating Narrating  Narrating  Requesting  Expressing hope Expressing hope
14	The God Narada	(i)What can I do for you?	Modulated Wh-Interrogative: full	Extending offer

In Scene 2, a new character is introduced by expressing interrogatives to find out Dewi's sadness. In her turn, Dewi uses moves for narrating her condition, followed by requesting and expressing hope. The modulated interrogative 'Can you help me?' is also to convey Dewi's expectation of Narada's capability to save her from her current condition. It is understood by Narada by extending offer.

Table 3. Mood types and language functions in Scene 3

Scene 3: Suddenly, The King came and saw Narada.

Turn no	Speaker	Move	Mood (Clause Type)	Language Function
15	The King	(i)Hi! (ii)Who are you? (iii)Don't touch my girl!	Minor Wh-Interrogative: full Imperative: full	Expressing anger Expressing anger Discouraging
16	The God Narada	(i)She is not your girl.	Declarative: full	Denying
17	The King	(i)It is not your <i>arrangement</i> .	Declarative: full	Expressing anger
18	The God Narada	(i)If you want her (ii)you must <i>adversary</i> me.	Declarative: full Modulated Declarative: full	Warning

Scene 3 shows that interaction between The King and Narada revolves around hostility. For example, wh-interrogative ‘*Who are you?*’ is not used to ask for information but to express anger by looking at the continuing moves that express discouraging, expressing anger, and warning.

However, two moves have problems with parts of speech (‘*arrangement*’ and ‘*adversary*’), which actually belongs to linguistic area.

Table 4. Mood types and language functions in Scene 4

Scene 4: The King Narada fought. Finally, The King lost and saved Dewi Sekartaji.

Turn no	Speaker	Move	Mood (Clause Type)	Language Function
19	Dewi Sekartaji	(i)Thank you so much my hero.	Declarative: elliptical	Expressing gratitude
20	The God Narada	(i)It is my duty to protect you. (ii)Why are you sad?	Declarative: full Wh-Interrogative: full	Acknowledging gratitude Finding out about sadness
21	Dewi Sekartaji	(i)I miss my husband. (ii)I want to meet him.	Declarative: full Declarative: full	Expressing longing Expressing longing
22	The God Narada	(i)All right (ii)if you want to meet your husband (iii) you must turn into a golden snail and (iv)you must also drift along the river.	Minor Declarative: full Modulated Declarative: full Modulated Declarative: full	Showing sympathy Advising  Advising
23	Dewi Sekartaji	(i)Ok. (ii)I'm ready. (iii)Goodbye my hero.	Minor Declarative: full Minor	Agreeing Agreeing Leavetaking
24	The God Narada	(i)Bim...salabim...abarak..... kadabrak	Minor	(magic spell)

The first move, Dewi's move, in Scene 4 is realized by declarative to express gratitude. It is acknowledged by Narada and continued with wh-interrogative to find out Dewi's sadness. The next moves express Dewi's feeling of longing. It is responded by Narada as a condition that needs his

power, once again, to save Dewi. The next Narada's declaratives conveys advising and agreed by Dewi. Therefore, this scene shows how Narada acts as a guardian for Dewi and how Dewi is being dependent on Narada's power.

Table 5. Mood types and language functions in Scene 5

Scene 5: Dewi Sekartaji was turned into a Golden Snail.

Turn no	Speaker	Move	Mood (Clause Type)	Language Function
25	Mbok Rondo	(i)Wow...there is a golden snail. (ii)It is very beautiful. (iii)I will bring it to house.  (iv)I will put it in jar.	Declarative: full Declarative: full Modulated Declarative: full Modulated Declarative: full	Expressing surprise Complimenting Expressing intention  Expressing intention

There is no interactive context in Scene 5. Instead a single turn is presented to introduce a new character, Mbok Rondo. Declaratives are used to express surprise, compliment, and express intention. Those are to show Mbok Rondo's

reaction over what she has just found (Golden Snail).



Table 6. Mood types and language functions in Scene 6

Scene 6: Since Mbok Rondo found a Golden Snail, many clumsy that happen.

Turn no	Speaker	Move	Mood (Clause Type)	Language Function
26	Mbok Rondo	(i)Who cooked this food? (ii)It is delicious ...nyam....nyam (iii)Who cleaned my house? (iv)I feel, just now, (iv)my house is very dirty. (v)I am confused.	Wh-Interrogative: full Declarative: full Wh-Interrogative: full Declarative: full Declarative: full Declarative: full	Expressing surprise Complimenting Expressing surprise Expressing confusion Expressing confusion

Scene 6 also presents only Mbok Rondo’s turn. Instead of for asking for information, wh-interrogatives are used to express surprise since

there is no moves that provide answers to her questions. Next, her feeling of confusion is expressed through declaratives.

Table 7. Mood types and language functions in Scene 7

Scene 7: One day, Mbok Rondo peeped at her home. Apparently, there was the princess that was cleaning the room and she was coming out and then Mbok Rondo crushed a jar and the princess could not turn into a Golden Snail.

Turn no	Speaker	Move	Mood (Clause Type)	Language Function
27	Mbok Rondo	(i)Who are you? (ii)You are very beautiful. (iii)Why could you change into golden snail?	Wh-Interrogative: full Declarative: full Modulated Wh-Interrogative; full	Asking for information Complimenting Asking for information
28	Dewi Sekartaji	(i)I am Dewi Sekartaji. (ii>Last time, I was kidnapped by the King. (iii)He wished to marry me but (iv)I am married and (v)suddenly Narada came and saved me. (vi)To meet my husband, I must change into a golden snail and drift along the river.	Declarative: full Declarative: full  Declarative: full Declarative: full Declarative: full  Modulated Declarative: full	Identifying oneself Narrating  Narrating Narrating  Narrating
29	Mbok Rondo	(i)Who is your husband?	Wh-Interrogative: full	Asking for information
30	Dewi Sekartaji	(ii)My Husband is Panji Asmoro Bangun.	Declarative: full	Identifying oneself

Scene 7 presents interaction between Mbok Rondo and Dewi Sekartaji. The first moves uses wh-interrogatives (‘Who are you’ and ‘Why could you change into golden snail?’) to ask for information about Dewi because it is the first time Mbok Rondo and Dewi meet. So, Dewi’s turn is

dominated by narrating and identify herself. Dewi’s long turn indicates that Mbok Rondo provides her opportunity to talk about herself and she acts as a good listener. Their interaction shows how they get acquainted and become closer.

Table 8. Mood types and language functions in Scene 8

Scene 8: At the time, Panji Asmoro searched his wife, wandered from one village to another.

Turn no	Speaker	Move	Mood (Clause Type)	Language Function
31	Panji Asmoro Bangun	(i)Excuse me, (ii)anybody home?	Minor Polar Interrogative: full	Asking for information
32	Mbok Rondo	(i)Oh yes. (ii)What’s up?	Minor Wh- Interrogative: full	Giving information Asking for information
33	Panji Asmoro Bangun	(i)Is there a beautiful princess here? (ii)Her name is Dewi Sekartaji.	Polar Interrogative: full Declarative: full	Asking for information Identifying oneself
34	Mbok Rondo	(i)There is. (ii)Dewi, come here, please!	Declarative: full Imperative: full	Giving information Requesting
35	Dewi Sekartaji	(i)What’s up Mbok?	Wh-Interrogative: full	Asking for information
36	Mbok Rondo	(i)Do you know him?	Polar Interrogative: full	Asking for information
37	Dewi Sekartaji	(ii)Oh my god darling, I miss you so much. (iii)He is my husband Mbok.	Declarative: full Declarative: full	Expressing longing Identifying oneself
38	Panji Asmoro Bangun	(i)I miss you too. (ii)How are you baby?	Declarative: full Wh-Interrogative: full	Expressing longing Asking for information
39	Dewi Sekartaji	(i)I’m fine. (ii)And you?	Declarative: full Wh-Interrogative: elliptical	Giving information Asking for information
40	Panji Asmoro Bangun	(i)I’m fine too. (ii)Baby I can’t leave without you. (iii)You are my soul mate so (iv)don’t go again!	Declarative: full Modulated Declarative: full Declarative: full Imperative: full	Giving information Admitting Requesting
41	Dewi Sekartaji	(i)I promise (ii)I will not go again. (iii)I will be more careful.	Declarative: full Modulated Declarative: full Modulated Declarative: full	Promising Promising
42	Panji Asmoro Bangun	(i)Baby let’s go back to our kingdom!	Imperative: full	Extending invitation
43	Dewi Sekartaji	(i)Darling, I can’t go without Mbok Rondo.	Modulated Declarative: full	Declining invitation/Asking for permission
44	Panji Asmoro Bangun	(i)Ok (ii)We will invite Mbok Rondo.	Minor Modulated Declarative: full	Granting Granting
45	Dewi Sekartaji	(i)Thank you darling.	Declarative: elliptical	Expressing gratitude
46	Mbok Rondo	(i)Oh I am very happy. (ii)Thank you.	Declarative: full Declarative: elliptical	Expressing happiness Expressing gratitude.

Scene 8 introduces Panji as another character in drama. The first turn is taken by Panji to ask for information about one’s existence. It is responded by Mbok Rondo with minor clause ‘Oh yes’ followed by wh-interrogative (‘What’s up?’) to let Panji tell his purpose of coming. However, this question is inappropriately used since it is usually used between close friends while the speakers here have just met at the first time. The next turns also involve information exchanges about someone like

‘Is there a beautiful princess here?’, ‘What’s up Mbok?’, and ‘Do you know him?’. The last question is asked by Mbok Rondo to Dewi, but Dewi’s turn is used for interacting with Panji to express longing. The next moves are realized by wh-interrogative and declaratives to exchange information between Panji and Dewi. These exchanges show their intimacy and close relationship between husband and wife that have just been set apart.

Then, an imperative (*‘Baby, let’s go back to our kingdom!’*) is conveyed by Panji and responded by Dewi by using modulated declarative (*‘Darling, I can’t go without Mbok Rondo’*). It has double language functions since Dewi is declining the invitation and asking for permission to take Mbok Rondo with them. It is found out by the moves for granting (*‘Ok’* and *‘We will invite Mbok Rondo’*).

The last moves function to express gratitude and happiness by Dewi and Mbok Rondo. They also show that Dewi and Mbok Rondo have made friends.

The results of the analysis can be summarized in the following table.

Table 9. Summary of mood types and language functions used in drama script

Mood (clause type)	Language functions	Knowledge of language functions
Declarative: full	Complimenting Identifying oneself Acknowledging gratitude Expressing love Expressing anger Discouraging Warning Denying Narrating Expressing hope Expressing longing Advising Agreeing Expressing surprise Expressing confusion Giving information Promising Expressing happiness	Interpersonal exchange Interpersonal exchange Interpersonal exchange Feeling Feeling Suasion Suasion Problem Information Future scenario Feeling Suasion Opinion Interpersonal exchange Feeling Information Future Scenario Feeling
Declarative: elliptical	Expressing gratitude Disagreeing	Interpersonal exchange Opinion
Modalized interrogative: full	Making introduction	Interpersonal exchange
Modulated declarative: full	Instructing Narrating Warning Advising Expressing intention Admitting Promising Declining invitation Asking for permission	Suasion Information Suasion Suasion Future Scenario Problem Future Scenario Interpersonal exchange Suasion
Modulated interrogative: full	Requesting	Suasion
Modulated wh-interrogative: full	Finding out about sadness Extending offer Asking for information	Feeling Interpersonal exchange Information
Imperative: full	Discouraging Requesting Extending invitation	Suasion Suasion Interpersonal exchange
Polar interrogative: full	Asking for information	Information
Polar interrogative: elliptical	Asking for information	Information
Wh-interrogative: full	Asking for information Expressing anger Finding out about sadness Expressing surprise	Information Feeling Feeling Feeling
Wh-interrogative: elliptical	Asking for information	Information
Minor	Showing attention Expressing anger Showing sympathy Agreeing Leavetaking Giving information Granting	Interpersonal exchange Feeling Interpersonal exchange Opinion Interpersonal exchange Information Suasion

## 5 CONCLUSION

From the results and discussion in the previous chapter it can be concluded that students use declarative, interrogative, imperative, and minor clause of mood types to realized language functions in drama script.

The students' actional competence is shown by the use of various language functions in terms of (1) interpersonal exchange, (2) information, (3) opinions, (4) feelings, (5) suasion, (6) problems and (7) future scenarios. Those language functions are used to express the characters' intent in communication and further, they can indicate the social roles of the characters and the relationship among the characters.

## 6 ACKNOWLEDGEMENT

Noeris Meiristiani is currently an active lecturer in English Education Department of Pancasakti University Tegal, Indonesia.

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## **A Lesson Study Implementation: Application Inquiry Strategy on Cooperative Learning to Enhance Sixth Grade Student’s Analysis of Electric Circuit**

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**Abstract:** Lesson study has implemented to study the six grade students analysis of electric circuit. Based on the class teacher findings, the students had difficulties on constructing electric circuit because in the former class the class teacher usually use general description such as picture, text with lecturing to teach electricity. Based on this, we tried to study how to overcome the student’s difficulties through lesson study. First in PLAN Session, the researcher, the lecturer and the class teacher discuss all the possibilities what student will react while the electricity learning process based on our former experiences. And we were agreed that the implementation should be practical cooperative work and the teacher should guide them by inquiry strategy. We also discuss students’ sitting arrangement. The students were divided in to three groups. In DO session the model teacher has implemented the lesson with the prepared learning materials. The number of students are 15 and divided into three groups. There were 8 observers with their cameras to record students’ activities and their cooperative work. In SEE session, we got interesting lesson learns such as all students were engage actively with the lesson because the learning material and the given problem made them challenged. We also got useful recommendations for future implementation.

**Keywords:** Lesson Study, Cooperative Learning

## 1. INTRODUCTION

Lesson study, the primary form of teachers' professional improvement focusing on instructional effectiveness in the classroom, is originated from Japan since a century. Currently it has disseminated through the world especially in Asia and America. In line with this Lewis (2009) stated that lesson study has spread rapidly in North America since 1999. Lesson study does not take place haphazardly rather it follows some steps. In line with this Lewis (2002) claimed that Lesson study is a cycle of instructional improvement in which teachers work together to: formulate goals for student learning and long-term development; collaboratively plan a "research lesson" designed to bring to life these goals; conduct the lesson in a classroom, with one team member teaching and others gathering evidence on student learning and development; reflect on and discuss the evidence gathered during the lesson, using it to improve the lesson, the unit, and instruction more generally; and if desired, teach, observe, and improve the lesson again in one or more additional classrooms

Even the concept of "Lesson Study" was introduced in Ethiopia it is not still implemented properly to the whole country educational system. Based on the triangular cooperation among JICA, Indonesian university of Education UPI and the government of Ethiopia, participants, teacher educators of college of teacher education from Ethiopia come to Indonesian University of Education (UPI) in order to take experience on Lesson Study. Since March 2011, Japan International Cooperation Agency (JICA) have been implementing technical cooperation project entitled "National Pilot Project For Improving Mathematics and Science education in Ethiopia (SMASEE) with federal Ministry of education of Ethiopia in term of Training program. The purpose of the training is to provide the participants from Ethiopia with an opportunity to improve the quality of Pre-service Education and Training (PRESET) in the field of Mathematics and Science education. The training program will also provide participants to exchange ideas, information and experience among themselves and the Indonesian counterpart. The training is for mathematics and science lecturer of college of teacher education in Ethiopia.

The training program has ten months duration in physics department, Indonesia University of Education (UPI). The training program is divided into three main activity as shown in picture 1. First (Yohannes) took the Subject-specific pedagogy in Masters degree program to deepen knowledge and practical skills. Second, undergraduate program to

have an experience in teaching-learning process in basic physics and Earth and Space science courses. and last Lesson Study (LS) program to obtain full understanding on lesson study that implemented ON campus and OFF campuses. In OFF campus activity me and other participants visited schools around UPI where lesson study was implemented in order to share experiences with lesson study experts, Teachers, and lecturers. at the end I can implement a lesson study.

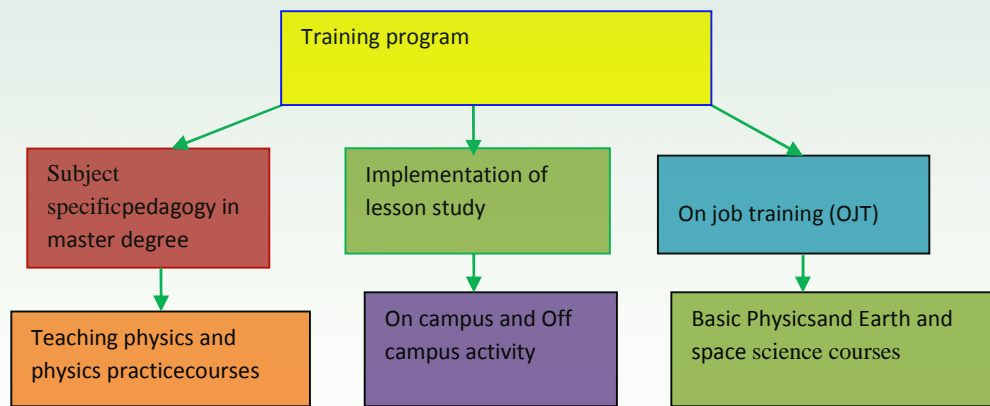


Figure 1 Training program of college teacher educator

In this paper, we describe implementation of Lesson study on Science in one of primary school in Bandung, west Java, Indonesia as part of training program to improve the quality of pre-service education and develop capacity of Physics educators.

## 2 THEORETICAL FRAME WORK

In this Lesson Study implementation from out of many methods we want to use Inquiry-based learning incorporating a cooperative learning approach to enhance sixth grade students' analysis of Electric circuit. Because Inquiry is a process by which children actively investigate their world through questioning and seeking answers to their questions. In line with this the national research council (2000 p 23) defined the Inquiry in education is a multifaceted activity that involves:

- making observations
- posing questions
- examining books and other sources of information to see what is already known
- planning investigations
- reviewing what is already known in light of experimental evidence
- using tools to gather, analyze, and interpret data
- proposing answers, explanations, and predictions
- communicating the results
- The role of science teachers in inquiry-based classrooms is to serve as facilitator of learning, guiding students through the inquiry process.

Heather Banchi and Randy Bell (2008) claimed that there are four levels of inquiry

1. *Confirmation Inquiry*: low level inquiry, very teacher focused, questions and procedures given by teacher. students outcome confirm the one which is known in advance

2. *Structured Inquiry*: is Less Teacher Focused, Question and procedure given by Teacher Outcome Not Known in Advance
3. *Guided Inquiry* this level of inquiry is learner focused inquiry. Questions given by teacher but procedure and outcome developed by learners
4. *Open inquiry*: is high level of inquiry, very Learner Focused. Learners form questions, design procedures for carrying out an inquiry, and communicate their results.

As Johnson, Johnson, and Smith (1991) suggested that cooperative learning is more than simply "working in groups," and should include: *Positive interdependence*; where team members are reliant on one another to achieve a common goal. *Individual accountability*; where each member of the group is held accountable for doing his or her share of the work. *face-to-face promotive interaction*; most of the tasks are performed through an interactive process in which each group member provides feedback, challenges one another, and teaches and encourages his or her group mates, *appropriate use of collaborative skills* where students are provided with the opportunity to develop and implement trust building leadership, decision making, communication, and conflict management skills. *group processing* in which team members establish group goals, assessment of their performance and they often identify changes that need to be made in order for the group to function more effectively

### 3 LESSON STUDY IMPLEMENTATION

#### 3.1 Plan session

We held the plan session in three meeting in S.D.P.N primary schools. On the first meeting the lecturer and trainee were introduced with the school principal and the class teacher and had discussion about the lesson study implementation as shown in figure 2. On the second meeting of school visit the trainee and the Lecturer were introduced with the six grade students as shown in figure 3, and made deep discussion with the class teacher about the Indonesian new curriculum, the actual situation of the student, the time when the lesson study will be implemented, and the area where the students had difficulties to understand. Based on physics teacher's finding the topic, Electric circuit was identified because in the former class the class teacher was usually used general description such as picture, text with lecturing and demonstration. We also assigned that (Mr. Yohannes) as the model teacher. When they assigned me to teach the lesson, we had anticipated that the language barrier (media of instruction) may be causing problem in communication between the teacher and students during the lesson. Based on the class teacher information the students can comprehend easy english delivered by teacher and read text with easy english, but he doubt about their english communication skill.



Figure 2. During Plan Session



Figure 3 . Meet with the students

Several ideas come from discussion like we should design the lesson interesting media that can be easily understood by the students like simulation and learning materials. To minimize the problems, at the end we agreed to use (1) simulation, (2) Preparing the learning material based on their daily life and (3) making students' worksheet in bilingual (both in english and indonesia version) In planning the lesson, our lesson goals were at the end of the lesson

the students be able to identify electrical components, construct simple circuit, understand between open and closed circuit, construct series and parallel circuit, understand the difference behavior between series and parallel circuit, and construct the combination of series and parallel circuits

We also agreed to prepare learning material, which is a circuit board that can be helped for students to connect simple circuit, series, and parallel connection in one and a work sheet containing two activities, the first activity was to verify simple circuit. This helps students to develop skill of constructing simple circuit, and to understand the components of the simple circuit. The second activity was to verify series and parallel connection this activity helps students to develop skills in constructing series and parallel connection and have understanding in differentiating between series and parallel connections based on circuit connection and its brightness. We also discussed about the appropriate teaching method that will be delivered. By considering the actual situation of the students, the learning material that we have and the nature of the identified topic, we agreed to apply Inquiry strategy on cooperative learning to enhance students' analysis of electric circuit. We selected inquiry based learning incorporates cooperative learning strategy based on the national research council (2000) cooperative learning can increase students involvement in the learning environment, Permitting students to work in group to solve problems can promote scientific inquiry and develop in students a feeling for “doing” science. Gets



students to work together, eliminating some of the competitiveness and isolation that can exist in most academic environments. To achieve the learning goals we divided the lesson into three parts: Introduction part, main part, and closing part. In the introduction part showing simulation to see how simple circuit works to motivate and engage the students with learning goals. In main activity giving learning materials that can help them *to solve four circuit problems that is related to simple, series, parallel and combination series and parallel circuit, and in the closing part* we give chance students to present their findings and results

### 3.2 Do session

The lesson had implemented based on the time scheduled. Before implementing the lesson, observers sit together to hear the teacher model explanation about learning goals and how he's going to achieve by presenting generally the lesson plan and learning material that are used during the learning process. The lesson plan and the worksheet used are attached in Appendix. (erase it) During implementation six observers had observed on students' detail activities. The learning process was recorded with three video cameras. We asked Observers to get detail information on:

- how students have been constructed simple electric circuit
- how students have been connected series and parallel connections
- how students analyze the difference between series and parallel connections
- sharing idea among the group members
- answering worksheet activities
- show willing in reflecting ideas in front of the class
- engaging students in an active way with learning materials
- evaluate whether the learning process meet with the intended goal
- questions raised by students and teacher respond

In the Introduction part the model teacher start the lesson by showing simulation about simple electric circuit, containing bulb, switch, battery, and cable and ask the students the following questions

- name each component of the simple electric circuit
- what happen to the bulb in open and closed circuit

In the main activity the model teacher made the students to analysis electric circuit by solving four problems: to do this the teacher gave the students circuit board as shown in figure 4. The holes are for

wire connections, the cross circles are lamp bases the power sign is batteries base and switches are already fixed on the board, black and red cables, batteries, bulbs. More over the bulbs in the board were represented by rooms like bath room, living room, and kitchen room

Problem 1. How to make Bath room lamp turn on

Problem 2. How to make Kitchen and Living room lamp turn on

Problem 3. How to make Kitchen and Bath room lamps turn on

Problem 4. Construct a circuit that makes all the three lamps are turn on In the closing activity the model teacher gave chance for students to present their result in front of the class, and the teacher with students together summarized the lesson.

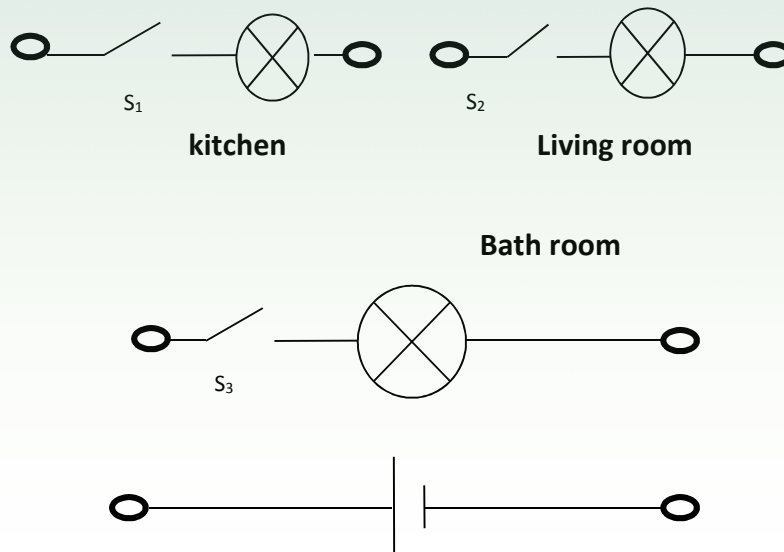


figure4.Circuit board

### 3.3 See session

In SEE session as shown in fig.5 we observe and analyze the video and record findings from observers. Our finding when viewing the video and reading the observations during introduction time in opening part as shown in fig.6 most students were participating actively in answering oral questions and exited by simulation. In main activity as shown in fig.7 all students directly engaged learning process in closing part as shown in fig. 8 teacher ask students to present their finding in front of the class and at the end teacher and students together summerized the lesson.



Fig .5 during see session

Based on Observer-1,observer -2, and observer-3and video analysis on Group -1 We found At the beginning when the group started to construct simple circuit they were confused about the red and black colors of the cable with the hole, which issued to connected one cable with another, most members of the group said the black cable should fix with

black hole others said black cable should connect with red at the end with most of the group agreed to connect black cable with black hole when they did it the lamp light up. But one student from the group wanted to test the connection black cable with red hole but rejected by some members of the group they said already the lamp is turned on but other members said please let us give him chance to let him try.They agreed the student to test it he connected the black cable with red hole and black hole with red cable at the end the lamp light up the group member admired him clap for him and they called him “good boy”. In this experiment the group realized that the color of the cable has not effect to make the lamp turn on. In this experiment what we have seen is first the group raised conflict ideas explained it with supported evidence and gave appreciation and value for those who gave solutions for the problem in democratic way. In this experiment we got findings which are not predicted during plan session because when we make the circuit board for learning material we didn’t give attention for the colors of cables but the students raised it as a problem and solved by themselves.

The students were actively engaged with the learning material. In their daily life the students use switch on and off lamps in their house without realizing it. After the lesson the students got experience on constructing simple electric circuits, series and parallel connection. They also identified the difference between series and parallel connection based on the brightness of the bulbs.

Based on Observer-4,observer-5,and observer 6 and video analysis.group 2were concentrated how to solve the problem and they have solved the four problems, but observer-4 was focused on one

student, who was not even touching the learning material but was taking careful observation on activities took place on the learning material by his group members, at the end when the teacher gave some written questions to be answered based on the experiment already they have done, in one question his group member answered it wrongly. Later on observer-3 asked him that question again orally he answered it correctly, based on his observation. This student couldn't share his idea to his group members for his different answer instead he changed his correct answer by the wrong one because he couldn't get confidence for convincing others.

Based on observer-7, observer 8 and video analysis on group -3 we found that group 3 faced two challenges, the first challenge was while they were constructing simple circuit; the group constructed simple circuit correctly, but the bulb didn't give light after that they discussed where is their mistake they asked the teacher to bring another new lamp and gave them. When they replaced it the lamp light up. From this group the observer found that a problem is existed the group discussed about it and put hypothesis then after tested it finally confirmed their hypothesis was correct. The second challenge was when they construct series circuit they were confused and their connection were wrong. Even both switches were switched OFF the lamps were giving light. After the teacher helped them to follow the procedures in the worksheet they easily correct it



Figure 6. Simulation in introduction



Figure 7. Cooperative learning among students



Figure 8 Students 's presentation in front of the class

The observers suggested that there had been lack of learning materials. All students couldn't get the same chance while constructing a circuit due to limited number of learning materials. in each group there were six students with one learning material. To overcome this barrier more learning materials should be needed for the next lesson. It shown several students still were very eager on engaging the learning materials they were not listen when one presents in front of the class. Therefore the teacher should take serious follow up on students to listen presentation

#### 4 CONCLUSION

Our findings shown that the students' engagement on the learning material, work sheet, and simulation was accomplished successfully.

The lesson met the intended learning goals. The students could construct simple electric circuits, series circuit, and parallel circuit and its combination. They also developed understanding about; the materials they need to construct simple electric circuit, difference between open circuit and closed circuit, and the difference behavior of series and parallel circuits, The overall, our lesson shown a remarkable progress in students understanding by applying Inquiry strategy incorporating cooperative learning to enhance student's analysis of electric circuit

The recommendation are 1) if someone intend to use these learning materials, we suggested there should be enough learning materials therefore all student can engage. 2) To make the implementation effective teacher guidance through the process is needed. 3) because the learning material make all the student eager to explore, in the closing session when students present their result and teacher summarization in front of the class make sure all students are paying attention towards the presentation such as students sitting position, should facing in front of the class

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## Using *Botakoja* To Improve The Quality Of Students’ Storytelling Ability In Oral Expression Class

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### ABSTRACT

Abstract:

Oral Expression course is a compulsory subject for the first semester students of Indonesian Language and Literature Education Department, Faculty of Teacher Training and Education, Ahmad Dahlan University. The problems arising in the process of teaching and learning activities, among others, are: students’ sense of independence, confidence, and creativity which have not been maximized yet. This is certainly a major concern of all the faculty members in order to make sure that all students do achieve the competency. Hopefully, the improvement effort taken in solving the problem will become a major milestone in the implementation of Lesson Study activities in the Indonesian Language and Literature Education Department. The selecting of Oral Expression Course especially the Storytelling one is due to the fact that the course is one of the basic courses needed to achieve the competency and it is also a prerequisite course all students must take before they get the next course series i.e. Rhetoric Course. The study focuses on the success of the storytelling process by utilizing existing media easily found around the neighborhood. As a result, *BoTaKoJa* (*Boneka Tangan Tokoh Jogja/Jogja Figures Hand Puppet*) is chosen as an alternative media to help develop students’ creativity. The Lesson Study done involves six relevant lecturers and twenty-five first semester students of class B in the academic year of 2013-2014. The lecturers involved in the Lesson Study go through some following cycles: planning, implementing, and reflecting. The Lesson Study itself is performed in four cycles. The data are collected using observation sheets, filled out by observer lecturers, and student worksheets. The data are then analyzed descriptively. Based on the data analysis results, it is found that the use of *BoTaKoJa* during the Lesson Study activity can improve the students’ creativity, self-confidence, and courage in doing story-telling in the class. From the lecturer’s side, however, it is obvious that the learning atmosphere in the class is getting more favorable, the learning effectiveness is achieved, the positive learning environment is created, and the students’ creativity to practice storytelling emerges at last.

Keywords:

*Lesson Study, BoTaKoJa, and storytelling.*

### A. Introduction

Storytelling belongs to speaking skills. This skill has to be mastered by the Indonesian Language and Literature Education students because they will be an Indonesian teacher and most of the materials they will teach are related to speaking skills. Furthermore, storytelling ability is included as one of the learning indicators in Oral Expression course.

Based on the interview and observation done in the class of the Oral Expression course, it shows that the learning process and outcome are not as expected yet. Some of the problems the students have include lack of courage to perform the story-telling, creativity in preparing the supporting media for the story telling, techniques in doing the storytelling, and other supporting elements in storytelling. These factors are indeed challenges for the lecturer, in this case the lecturer needs to present and create such an atmosphere which enables to cultivate and develop the elements the students lack of in the class so that the students become confident, creative and innovative as expected.

Courage or self-confidence is an indicator of learning achievement. This becomes one of the initial factors in the learning process. From the lecturer's point of view, however, the lecturer feels that many of the students are not yet confident enough and quite shy in front of the class. In addition, lecturer also sees that the students still find it difficult to perform story-telling fluently and coherently in the class. The result of the interview from the lecturer is then supported by the results of interviews with the students taking the course. From the interview, they say they are shy, less confident, less fluent, and difficult to make sentences when performing the story-telling.

Based on the interview data above, it is obvious that it's necessary to have an improvement process to find solutions to minimize the problems. One of the possible solutions is by creating media to support the process of storytelling. Storytelling will be easier if it is supported by the mastery of materials and the use of media. One of the alternative media used in storytelling is *BoTaKoJa* (*Boneka Tangan Tokoh Jogja/ Jogja Figures Hand Puppet*). *BoTaKoJa* can be an effective media to trigger students'

creativity in order to develop the imaginative elements of the storytelling.

There are four figures in *BoTaKoJa*, they are *Mbah Bejo*, *Mbah Sri*, *Thole*, and *Genduk*. These four figures are the reflection of Yogyakarta local wisdoms. The reason of using Yogyakarta figures is that it is expected to instill positive characters and local wisdoms for Yogyakarta people.

The combination between storytelling and *BoTaKoJa* is hoped to give a more enjoyable learning atmosphere and to stimulate students' creativity to perform better in front of the class. Besides, the presence of stimulating learning process will be able to encourage the students to create and develop media needed to support the performing of the storytelling in front of the class.

### B. Supporting Factors in storytelling

Storytelling is part of speaking skills. Speaking is an ability to pronounce sounds of articulation or to pronounce words to express, state, deliver thoughts, ideas, and feelings (Arsyad and Mukti, 1997: 2.2). The main purpose of speaking is to communicate. In order to convey information effectively in communication, the speaker should deeply understand what will be delivered and know how to deliver it. The effectiveness of speaking is supported by linguistic and non linguistic factors. The linguistic factors are (1) the accuracy of speech, (2) the placement of stress, (3) dictions, and (4) the accuracy of speech target. The non linguistic factors are: (1) natural, calm and flexible attitude, (2) directing sight to the speaker, (3) willingness to face someone else's opinions, (4) gestures and proper expression, (5) fluency, (6) relevance/reasoning, and (7) and topic mastery (Arsyad and Mukti, 1997: 22).

Based on the need analysis conducted, it is known that a number of students find it difficult to orally tell with the media and perform it in front of the class. 75% of the students say that it is difficult and only 25% of the students feel that it is easy. Related to the the problems experienced by the students in storytelling, here are the data: 85% students feel of fear, shame, and nervousness, 10% students are not able to storytell smoothly, 80% students do not tell the story coherently, 70% students feel unconfident, 50% students

forget the story, and 75% students find it difficult to prepare the media of storytelling.

The data also show that students experience problems of both linguistic and non linguistic. However, based on the data, it's obvious that non linguistic problems dominate more than the linguistic ones. Thus, when teaching speaking skill, it's strongly suggested that the lecturer teaches the students not only the linguistic aspects but also the non linguistic ones. Non linguistic factors lead more into mental problems, vocal, media, and body language. By doing so, the students will master both factors balancedly.

**C. Selecting tasks in speaking practice**

There are many tasks that can be given to the students to measure their speaking skill in the target language. Whatever the form of the task is, it should allow the students not only to express their language competence but also to deliver their ideas, thoughts, feelings, or convey messages (Nurgiyantoro, 2011: 402). The tasks given can be in the form of image stimulus, sound stimulus, image and sound stimulus, and storytelling.

To be able to reveal the students' speaking skill, image can be used as a stimulus of good talk. This includes the use of learning media made from *BoTaKoJa*. It is useful to trigger students' creativity in speaking practice.

As *BoTaKoJa* can be used as a stimulus of creativity in storytelling process, picture media can be used as another media as a stimulus as well. Image stimulus used as a stimulus of speaking can be grouped into object image and story image. Object image is an image about particular object which independently stands and its existence does not require the help of another image. Story image, however, is picture series consisting of a number of interrelated image panels entirely forming a story (Nurgiyantoro, 2011: 402).

Story image contains an activity, reflects particular purpose or idea, meaningful and shows the sequence of story. The image panels may be with number or without numbers so that the participants themselves who will actively and logically determine the sequence of the story. Besides using image stimulus, students' speaking skill can also be stimulated through sound stimulus and visual and sound stimulus. Sound stimulus speaking task is closely related to listening skill test.

The relevance between these two competences should be emphasized in language learning so that the learning process can meet the demands of the whole language.

Based on the observation result in cycle four, it is found that the value of students' creativity improved which is indicated by each group preparing the materials and media used in the storytelling. Some students use media like hand puppet, drawing paper, and books containing fascinating stories. This way, the classroom atmosphere becomes more alive, enabling the students in the classroom, and minimizing the teacher's role during the teaching and learning process.

**D. Communicative approach in language skill**

Learning Indonesian language is regarded not successful or it still does not meet many parties' expectations. It fails. The causes of the failure of this have been studied by the experts and one of the factors is believed to be related to the fact that teaching Indonesian language gives more emphasis on the knowledge of the language or language structure rather than on the language skills (Sugono, 2008: 317). Students are only taught about grammar, but they are hardly given opportunities to use it in speaking practice. Therefore, it is necessary to apply communicative approach in language learning. There are several main principles of communicative approach (Anindyarini, 2007: 63), some of them are as follows: (a) The main purpose of language teaching is to help learners use the language to communicate, either communication uses language functions or grammatical structure, (b) Language is used in social context and should be in line with the setting, topic, and participants, (c) Learners should be largely given opportunities to reach the agreed meaning, which is trying to make them understand; (d) Learning should be able to reveal the opinions, ideas, and feelings. One of the purpose of communicative approach-based learning is to prepare the learners for such a meaningful interaction in the natural use of language (Wardani, 2002; 6.29).

**E. Implementation of Lesson Study in Oral Expression Course**

The lesson study is intended to improve the learning quality of Oral Expression course especially on storytelling

topic. The lesson Study was conducted in the first semester of class B in the academic year of 2013-2014. The students involved are 25 students. There were four lecturers involved in this activity i.e. two lecturers act as the observers and the other two lecturers served as the model lecturers. The lecturers involved were: Roni Sulistiyono, M.Pd., Titiek Suyatmi, M.Pd., Hermanto, M.Hum., and Denik Wirawati, M.Pd., while Wachid Eko Purwanto, M.A. and Iis Suwartini served as model lecturers. The documentation process was assigned to two students named Angga Yudik Arrasyid and Rofiq. These two who have been known having good skill in photography and documentery.

This study was conducted from 23 November 2013 up to 30 November 2013. This activity was divided into four cycles, each cycle was divided into three main activities i.e. planning, doing, and seeing. In Planning stage, the involved lecturers conducted problems identification during teaching and learning process and then designed the learning tools such as lesson plan, student worksheet, and observation sheet. Student worksheet functioned to asses and observe students' activities when performing storytelling in front of the class, while the observation sheet was used to assess students' activeness and would be done by the observers during the Doing stage. In Doing stage, the model lecturers did learning activities and other lecturers observed the students' learning process and observed the behavior of model lecturers. The next stage was Seeing or Reflecting the result of learning and observation towards students and model lecturers. The result of Seeing or Reflecting stage was used as the basis for improvement and planning of learning in the next cycle.

The data of the study were obtained using observation sheets managed by all lecturers involved in the second cycle of lesson study. Several positive points in this activity indicated that this lesson study was successful to improve the academic atmosphere in the Indonesian Language and Literature Department. The data were analyzed using descriptive method, then.

#### F. Learning Storytelling

Storytelling is one of the methods in language learning process, especially in the

topic about communication. Farida (2012: 123) states that storytelling is the oldest learning method. Oral tradition tells and creates great men throughout history. Since children world is a world of imagination, imaginative stories might be very effective to convey learning materials and moral values. Besides having fun, storytelling is beneficial to:

1. Add creativity and imagination,
2. Add insight, especially when the stories come from other countries or cultures,
3. Improve language, listening, and communication skill,
4. Improve conceptual ability and emotional quotient, and
5. Obtain relaxation and build emotional intimacy between teacher and students.

Storytelling does have its own challenges especially when it's used to deliver the materials. If a lecturer is able to do it well in front of the students, there are some supporting aspects in storytelling that can be well delivered as well. The supporting aspects delivered are: creating the atmosphere, vocal or sound, expression, timing, and fun ending.

The first aspect is creating the atmosphere. To do this, there are things which should be done by a storyteller i.e. determining the setting (quiet and comfortable), ensuring that the time is spare, leading the audiences to comfortably sit in front of the storyteller, saying “*wait, be patient*” to them who interrupt to ask, and also facing the audiences' eyes alternately. The second aspect is vocal or sound. This can be done by selecting simple sentences that are easily understood by the audience. The storyteller needs to ensure that the audience can hear the storyteller's voice and the tunes of the sound are in line with the situation of the story, and occasionally asks the audiences to imitate the storyteller's voice. The last aspect is expressions. The first thing to do with this aspect is ensuring that the storyteller knows about what will be told (mastery of the material), then expressing what the storyteller feels naturally and not excessively. The fourth is time management or timing. It is done through some things like having breaks at the right times so that it can emerge curiosity, changing the speed of the plot, giving various stressing such as tensed, relaxed, and sad. The last aspect is ending. Ending means that the storyteller should not



retell the climax, just tell it once. He should not be overdoing, state the moral values, and then end the story immediately.

**G. Application of *BoTaKoJa* in learning the storytelling**

*BoTaKoJa* stands for hand puppet of Jogjakarta figures. The background of selecting *BoTaKoJa* is based on the result of the discussion with the model lecturers of lesson study. The model lecturer used *BoTaKoJa* is Iis Suwartini, M.Pd. The stages done in the implementation of *BoTaKoJa* in learning storytelling are as follows:

1. The introduction of the figures

The characters performing in *BoTaKoJa* consist of four main characters. These four main characters are *Mbah Bejo*, *Mbah Sri*, *Thole*, and *Genduk*.

2. The introduction of the characters

The characters owned by these four characters are: *Mbah Bejo* is a typically Javanese who still upholds Javanese principles, patient, affectionate, and humble. *Mbah Sri* is a talkative, sometime stubborn, painstaking, and curious woman and she sometime really wants to know about someone else's business. *Thole* is described as a boy who is independent, sociable, good at reciting Al Quran, and always cheerful. The last character is *Genduk* who is usually called *Nduk*. *Genduk* acts as if she was very modern, curious, idler, and extravagant.

3. The values of local wisdoms

One of local wisdoms appearing in the story is the costumes worn by the characters, which are striped woven clothes, batik, bun, and *blangkon*. The characters which belong to Javanese wisdom and culture are patient, defenseless, and tolerant of the cultural diversity.

4. Techniques in playing *BoTaKoJa*

Generally the techniques in playing *BoTaKoJa* are the same as those applied in hand puppet. The difference is only on the way of storytelling and the storyteller understands the figures. In other case, however, the storyteller may only modify the figures.

After introducing the *BoTaKoJa*, the next step is to practise implementing

*BoTaKoJa* in lesson study especially in oral expression course on topic of storytelling. Here is the description of lesson study activities conducted on November 23th until 30th which consisted of 4 cycles. Except the model lecturers and the documentation staff, every lecturer involved used two sheets to monitor the activities of the students and the model lecturers. This activity was done in each cycle. To get the objective data, the observers were divided to observe particular group that had been formed. The observation result would be an authentic evidence of the lesson study implementation. The aspects observed during lesson study activity were as follows: Students' readiness in following the lecture, students' discipline during the lecture, students' courage in conveying opinions, the emergence of confidence when performing, the comprehensive performance, devices, media, and materials prepared by the students in storytelling, and their enthusiasm in following the lecture as well.

Another sheet was also distributed to the students. The sheets were worksheet and assessment sheet of the students' performance containing mastery of the storytelling materials, audience management, analogy or the relation between the story and the example, expressions, gestures or manners, creativity in terms of diction, and time management used in storytelling.

In the meeting of cycle one, the model lecturers demonstrated the use of *BoTaKoJa* in delivering storytelling topic. The model lecturers also explained about some techniques and requirement of storytelling. The students followed the storyline delivered by the lecturers. Some students gave questions in the last session when the model lecturers explained the material and techniques in storytelling.

There were some other findings of this cycle too. First, students were still confused about what was done. The second problem was about what story was going to be performed. The third one was about how to reduce the sense of nervousness when performing storytelling. Seeing this condition, then, the lecturers decided to take action by giving them a week longer to prepare and practice storytelling by using the existing media.

The second meeting was done by Iis Suwartini as the model lecturer. The

activities can be described as follows: since the previous meeting was emphasized on preparation and basic concepts of storytelling, in the second meeting, though, the students were asked to practice storytelling by using media they made themselves. There were five students groups who used media in storytelling. Group one used *Timi* puppet and also little puppet, group two used cut images like shadows, group three used picture story book, group four used cartoon movies which have been redubbed, and group five used puppets.

Based on the observation done by the observer, it can be concluded that students' creativity and courage is quite good. This is proven by the existence of students' good enthusiasm, students' readiness in following the lecture, students' discipline in joining the lecture, students' courage in conveying any opinions, the emergence of confidence when performing, the comprehensive performance, devices, media, and materials prepared by the students in storytelling, and also their high enthusiasm in following the lecture.

#### H. Conclusion

The application of *BoTaKoJa* in oral expression course on storytelling material brings such a positive impact. It can also emerge the students' creativity to develop media which is proven by students' creativity in developing various media, the improved confidence, and the vocal ability in storytelling. Therefore, it surely brings impact on the implantation of lesson study in the Indonesian Language and Literature Department especially as an effort to create a more enjoyable learning atmosphere and build such positive academic culture. By so doing, the indicators of learning achievement will easily be achieved and the better character of lecturers and students is accomplished.

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## **Engaging 3NT Students in the Learning of Electronics through the ACE Electronics Board**

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### **ABSTRACT**

Electronics is one of the three technologies required for Part B of the written paper in the subject Design and Technology (D&T) and this can comprise up to 46% of the overall theory marks. Competency in electronics is important in enabling students to perform well in the subject. According to theories developed by James Jenkins, Jon Saphier and E. Skinner, engagement is seen as a crucial component in effective student behaviour or learning. Based on the Skillful Teacher Map of Pedagogical Knowledge (Fig.2), enhancing engagement is one of the principles of learning in impacting attention and engagement. Two electronic boards were designed and built for students to experiment, test and understand the use and applications of electronic components and circuits based on inquiry learning. Three research lessons were conducted for students from Secondary 3 Normal Technical class (3A1). Worksheets for these students were customised to their learning levels through the provision of scaffolding and guiding questions. The team adopted the 3 factors behind the choice of the learning strategy (Linda Darling Hammond, 2008); nature of (1) the materials to be learned, (2) the nature of the skills, knowledge and experiences that learners bring to the situation and (3) the goals of the learning situation and the assessments used to measure learning relative to these goals. The class was sub-divided into pairs or small groups for collaborative learning and discussion. A total of three research lessons were conducted, with each consecutive lesson a refinement of the previous lesson. In the final lesson, the seating arrangement was optimally planned after taking into consideration the student dynamics. The lab worksheets were further adapted to provide more scaffolding to allow students to make connections to their prior knowledge. Additional opportunities were provided for students to select the input/sensor type and to provide feedback. Based on observations during their search lesson, students were more engaged when experiencing such hands-on experiments. The main research lesson data was collected from Secondary 3 A1 students (N=15) using quantitative measures that included survey questionnaires and post-lesson reflections. The survey results showed positive responses. The findings are further substantiated through semi-structured interviews with 6 randomly selected students. After transcribing and coding, the interviews provide additional evidence to support the results of the survey. The use of the ACE Electronics Board has created a positive impact on the students' attention and engagement level in the teaching of Electronics in Design and Technology.

## 1 INTRODUCTION

### 1.1 Background of Study

The Normal Technical (NT) stream was introduced in 1994 to cater to the needs of lower ability students. This was also done to reduce the school drop out rate and to help ensure ten years of general education for all students. As the ministry had recognized that these students were less academically inclined, the NT stream was to prepare students for additional vocational training at the Institute of Technical Education (ITE).

Research done by NIE researcher have shown that the reasons behind their poor academic performance include low literacy levels, students creating multiple “centres of disruption” as a result of low attention span and constant negotiation between teachers and students. Additional research also revealed that the factors of Cohesion, Task Orientation and Satisfaction were important factors in students’ perception. It was shown that NT students progressed to higher levels, they tend to become less task oriented.

The NT curriculum was reviewed and revised in 2004. Emphasis was placed on making lessons practice oriented and the introduction of electives to develop students’ specific interest. None the less, research done by Albright in his work “Origins and Perceptions of the Normal Technical Stream” revealed that students tend to be more engaged when there was more hands-on involvement as compared to a traditional teacher centred model of learning. From the observation by teachers teaching normal technical classes, the students often have the following issues ranging from short attention span, poor reading and writing skills, family issues, poor self-confidence, presence of mild learning disabilities, classroom discipline and lack of intrinsic motivation in studies.

Earlier studies done regarding the motivation, self-esteem and study habits of normal technical students have also pointed to the above factors as causes for their poor academic performance. Some of the more significant factors will be mentioned briefly.

The poor English language literacy levels of NT students are largely inherited from their poor acquisition of English in their primary school years. Further more, research has shown that less than 20% of such students speak English at home. The comparatively low proficiency levels of students are seen as a main cause of the common feedback that NT students have problems understanding the lesson content taught in class. This is also

hampered by the use of technical or science related vocabularies that are often new and alien to NT students.

In addition to the above, the short attention span of NT students is often cited as a challenge for teachers. A number of NT students also pose discipline issues for teachers and their classmates alike when they interrupt lessons through various disruptive behaviour. The teacher has to manage such students while ensuring the lesson objectives are met. In connection with this, lessons have to be planned in such a way that there is a good mix of hands-on and teacher-centred instruction so as to maintain the attention of students.

Lastly, the low self-esteem or confidence levels of NT students can be attributed to negative perceptions from their schoolmates from other streams, parents and even themselves. Many a times, NT students give up on their work when they face the slightest difficulty in their academic work. Thus lessons and teaching packages have to be planned so that there is adequate scaffolding for NT student.

In Design and Technology lessons, Upper Secondary NT students have a reduced curriculum compared to the Normal Academic students, however they are still required to learn Electronics and be able to identify the electronic components and the few types of sensor or 555 (timer) circuits.

In order to find out more about the issues faced by 3 NT students in this topic the PLT members administered pre and post surveys on 3 A1 students taking Design and Technology so as to gather more data regarding their needs, aptitudes and suggestions. The ACE board learning package was designed with this in mind to encourage hands-on and collaborative learning. Relevant literature review, methods and results will be discussed in the following sections.

## 2 METHODOLOGY

### 2.1 Framework of Study

Linda Darling Hammond (2008) assessed the need for teachers to understand about the kind of teaching that produces powerful learning. In order for the D&T team of teachers to determine the Research Lesson Study (RLS) goal, the team deliberated on the importance of engaging the 3 NT students in the learning of electronics based on the findings in the earlier sections. The discussion was also supported by some analysts that meaningful learning cannot be met through passive, rote-oriented learning focused on basic skills and memorization of disconnected facts. Good &

Brophy (1986) termed “meaningful learning” explicitly as:

- Learning that enables critical thinking
- Flexible problem solving
- Transfer of skills and use of knowledge in new situations.

According to Linda Darling Hammond (2008) and Donovan & Bransford (2005), there are 3 fundamental and well-established principles of learning that are particularly important for the RLS team to know about these students learning.

The 3 fundamental principles of learning that are important for teaching are:

- Students come to the classroom with prior knowledge that must be addressed if teaching is to be effective ~ *if what they know and believe is not engaged, students may fail to grasp the new concepts and information that are taught, or they may learn them for purposes of a test but not to be able to apply them elsewhere, reverting to preconceptions outside the classroom. This means that teachers must understand what students are thinking and how to connect with their prior knowledge if they are to ensure real learning.*
- Students need to organize and use knowledge conceptually if they are to apply it beyond the classroom ~ *teachers must be able to structure the material to be learned so as to help students fit it into a conceptual map and teach it in ways that allow application and transfer to new situations.*
- Students learn more effectively if they understand how they learn and how to manage their own learning ~ *teachers can teach students how to use, arrange, and manage learning strategies, including the ability to predict outcomes, create explanations in order to improve understanding, note confusion or failures to comprehend, activate background knowledge, plan ahead, and apportion time and memory. Successful teachers provide carefully designed “scaffolds” to help students take each step in the learning journey with appropriate assistance, steps that vary for different students depending on their learning needs, approaches and prior knowledge.*

These three fundamental principles can be further expanded to seven ways in supporting the process of meaningful learning used by highly effective teachers.

- Creating ambitious and meaningful tasks that reflect how knowledge is used in the field.

- Engaging students in active learning so that they apply and test what they know.
- Drawing connections to students’ prior knowledge and experiences.
- Diagnosing students’ understanding in order to scaffold the learning process step by step.
- Assessing students’ learning continuously and adapting teaching to student needs
- Providing clear standards, constant feedback, and opportunities for work.
- Encouraging strategic and metacognitive thinking, so that students can learn to evaluate and guide their own learning.

The design of the RLS package through the ACE Electronic Boards (hands-on problem solving approach), drew skills of the students (e.g. learning experiences, assessing students’ learning, and class climate) from the class’s pre-lesson observations to create a meaningful authentic learning experience for the students. This authentic learning experience allows students to draw parallels between the relationship of their learning capacity and the external world and understand these two for a more systematic whole. In the process of their learning, students will acquire not only the real life knowledge but also the ability to link their learning in the classrooms with the world around them. Further to their search done by Hammond, the D&T team also considered the factors behind the choice of the learning strategy. The choice of the appropriate teaching strategy is crucial as different contexts require different kinds of learning.

The appropriateness of the use of the particular types of teaching strategies depends on these 3 factors in the model developed by James Jenkins in the “The Tetrahedral Model of learning”:

- The nature of the materials to be learned
- The nature of the skills, knowledge and experiences that learners bring to the situation.
- The goals of the learning situation and the assessments used to measure learning relative to these goals.

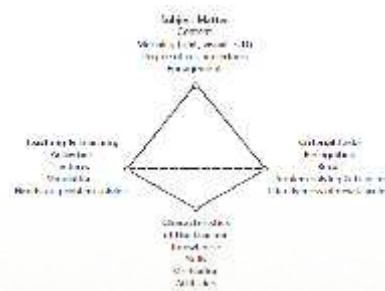


Figure 1

According to the studies we have done earlier, the 3 factors listed above are supported by the Map of Pedagogical Knowledge presented by Jon Saphier (2008) in his book “The Skillful Teacher”.



Figure 2

Jon Saphier defined in Fig.2 that management skills support and make possible instruction, curriculum skills design instruction, motivational skills empower instruction and instructional skills deliver the goods. Altogether, these areas of performance delineate teaching. The D&T team focused on the use of impacting students through “attention and engagement” (management skills). Concisely speaking, this will take effect when students are operating, responding, moving and discussing during the learning experience (instructional skills). In the context of the RLS lessons and the use of ICT such as real-time Moodle response, the environment and setting has been planned such that it encourages discussion in small groups (curriculum and motivational skills).

## 2.2 Research Learning Study (RLS) Learning Goal

The goal of the lesson is to engage the 3NT students in the learning of electronics through the ACE Electronics Board; that is to increase the reengagement level through experiential learning.

There are additional sub-objectives that support the over-arching goal. These objectives include engaging students and involving them (fun and enjoyable) through hands-on teaching and learning activities, and enhance students’ understanding of the electronic conceptual processes they are learning to increase their proficiency in answering electronic theory questions for the NT level.

In this RLS, the team will focus only on the 3 factors behind the choice of the learning strategy to achieve the goal. Specifically, the RLS seeks to find answers to the following questions:

- (1) Does the RLS (3NT students learning of electronics through the ACE Electronics

Board); (i) increase students’ engagement level? (ii) enhance students’ learning?

- (2) What is the impact of the RLS on each of the 3 factors: the nature of materials to be learnt; the nature of skills, knowledge and experiences that learners bring with them; and the goals of the learning situation and the assessments used to measure these goals.

## 2.3 Implementation

### 2.3.1 Pre-Lesson Observations

The team began the pre-lesson observations of Secondary 3 Normal Technical D&T class (N=15) on two separate occasions and this was carried out. The initial observations were beneficial for the team as it enabled the team to be able to identify behaviour, learning styles and needs of the secondary 3 Normal Technical students.

The first lesson (1st Pre-lesson Observation) covered basic electronic, series and parallel circuits and Ohm’s law concept with two electronics worksheets to sum up the lesson. Although the lesson was a recap of the students prior knowledge on electronics that were covered in their lower secondary science lessons and D&T lessons in previous years, the team noticed that the students were not able to keep up with the lessons. Observers noticed that about three-fourths of the students were not able to measure and calculate the total resistance of the lesson despite given formulas. Students were also not able to understand the strategies of doing cross multiplication for resistance of resistors connected in parallel. They were also confused by the numeric models for adding fractions with unlike denominators. From the observations and posing of questions to the students, the team discovered the reasons for the students’ problem in understanding the lesson although that was a recap lesson for them. The students were weak in their mathematics and science. Thus, the instructions and assignments given to students have to be simplified and scaffold so that students can comprehend the allocated tasks.

The team also noted the seating arrangement of the students. For the 1st lesson, the students were seated according to their choices. This was a factor that impeded learning as students who were able to understand the concepts taught were seated together. For example, students who are much vocal, and able to grasp concepts faster would prefer to sit together while student who are quieter were seated in another separate group. Being seated with familiar classmates also resulted in students engaging in their own conversations due to their short attention span. The weaker students were not able to follow the lesson very well. The class

was made up of mixed ability students with diverse learning needs. As such, they were often lost during the lesson and unable to follow the instructions of the lesson.

The next lesson (2nd Pre-lesson Observation) covered the learning of Transistor Sensing Circuit with the concepts of transistor with different sensors and current flow. The lesson was a progression of the previous lesson on Ohm's law and total resistance in a circuit. Before the concept of transistor was taught to the students, the students were given a short quiz to recap the previous lesson on the calculations of resistance and ohm's law. Students were also assigned pre-allocated seats to reduce the possibility of students being off-task during the lesson.

The lesson on Transistor Sensing Circuit was then introduced to the students. The lesson's instructions were simpler as compared to the previous lesson. Observers noticed students were not able to follow the lesson flow as the concept taught was new to the students. The students were also not able to stay focus for a long time during the theory lesson. Students started showing signs of restlessness and were distracted by the surroundings instead of following the lesson. Some students started engaging in their own conversations in the midst of the lesson while others started doodling in their effort to start focus during the lesson.

### 2.3.2 Pre-Survey Results

Apart of having pre-lesson observations, a pre-survey was conducted with the class to assess the students' learning and how they feel towards the electronic theory lessons that was taught. The survey seeks to give the Lesson Study team feedback and measurement through assessment for learning. It is shown that majority of the students felt it was difficult to learn electronics from the D&T textbook. In addition, they also shared their areas of concern in areas in terms of their understanding for the topic in electronics and how the teacher can make the lesson easier for them to understand the applications of electronics such as the use of hands-on activities and electronic circuit board to help them learn better.

1. Generally, rathe difficulty of learning electronic s from the D&T textbook.

Very easy	Easy	Difficult	Very difficult
0	2	10	0

2. Which aspect of electronics do you have problems understanding? (You can circle more than one).

Knowledge of component and symbols (e.g Capacitors, LDRs)	Type of circuit diagrams	Application of circuits. (e.g. Moisture sensor can be used in soil)	Calculation of V/R/I etc.
5	2	3	6

3. In what ways do you think the teachers can help you to learn the applications of electronic better? (You can circle more than one).

Additional Theory Lesson	Use of circuit boards to demonstrate	Hands on making of circuits	Use of past exam and test question
3	8	7	1

### 2.3.3 Pre-observation Debrief and Planning for Lesson 1

After the pre-lesson observations, the teams sat down and discussed about the lesson. There were some suggestions on how future lessons could be further improved. The team decided to improve and revise the lesson based on 3 factors of the lesson supported by the Map of Pedagogical Knowledge in Fig. 2:

1. Setting the class climate (Motivation)- Seating arrangement of the students  
The groupings of the students were rearranged such that a stronger student pair with a weaker student. These stronger students will act as buddies to the students paired with them. This arrangement promoted collaborative learning and enabled students to learn better among themselves.
2. Models of Teaching and Clarity (Instructional Strategies)- Scaffold instructions given to students to cater to the students learning ability. Shorter and clearer instructions were set for the students to aid them in following the lesson so that they were able to learn the concepts of electronics better. This would also help the students to tap on their prior knowledge.
3. Discipline and routines (Management)- Setting of class routines.  
The setting of classroom routines and discipline for the students ensured students were aware of the expectations of each lesson. Students were aware of the desired behaviour in class and were reminded to pay attention during the lesson.

In addition, the team also looked at the factors behind the choice of the learning strategy. The choice of the appropriate teaching strategy was required for different kind of learning. Adapted from the factors found in the model by Bransford et al. (2005), the team discussed about:

1. The nature of the materials to be learned (F1).
2. The nature of the skills, knowledge and experiences that learners bring to the situation (F2).
3. The goals of the learning situation and the assessments used to measure learning relative to these goals (F3).

The team felt that to better engage students in active learning, there was a need to have some hands-on activities. This would break the monotony of the theory lesson and the students would be fully engaged throughout the lesson. Having hands-on activities could also help students to learn to apply the knowledge that they have learnt in real-life contexts. The team felt that future lessons should include more hands-on activities to guide and evaluate their learning. Thus, the team decided to introduce the ACE Electronics Board for future lessons.

### 2.3.3.1 Research Lesson 1

The first research lesson was held and covered the use of transistors in sensing circuit (real-life applications) through the use of ACE Electronics Board. The students were required to record their observations in the Lab 1A worksheet through structured and scaffold investigative lab work. Students were required to tap on their prior knowledge on electronics before this research lesson.

Students were told to spend about 10-15 minutes of their time to complete a simple investigative activity on the types of resistor to recap on the previous lesson on resistors. The students were to identify the different types of resistors that they have learnt namely variable resistor, potentiometer, Light dependant Resistor (LDR) and fixed value resistor.

After which, instructions were given to the students to guide them in the hands-on activity (use of ACE Electronics Board). The class was tasked to work on the Lab 1A worksheet in pairs. Likewise, instructions were given in sets to help the students understand the tasks better and each member of the pair had a role to play in the activity. For example, one of the students would be in-charge of collecting the Lab worksheet, multi-meter and battery while his partner would be in-charge of collecting the ACE Electronics Board and the set of components

required for the activity. Students were asked with guided instructions to carry out a prior check on the equipment as part of the established classroom routines. This helped the teacher to set the class climate and prepare the students for the start of the hands-on activity.

The Lab 1A worksheet required the students to measure the resistance of the circuit with the use of a multi-meter when adjusting the potentiometer. This allowed students to build on the prior knowledge learnt in the pre-lesson observation on resistance. Students were then asked to test out the sensing circuit by adjusting the potentiometer and the Light Dependent Resistor (LDR) in the circuit. The students were able to follow the hands-on activity and recorded their observations in the lab worksheet.

### 2.3.3.2 Debrief for Research Lesson 1

Observers noticed that the students were engaged throughout the lesson as they were given a number of tasks in the hands-on activity. The students had to conduct the experiment and record their findings in the Lab worksheet. However, it was also observed that the students were not able to express their findings and observations in words to answer the questions in the Lab worksheet. Students faced some issues in completing and understanding the questions in Lab worksheet. In addition, students were also not able to answer the 3-2-1 reflection questions at the end of the lesson. Due to a lack of time, the lesson was not completed.

### 2.3.4 Planning for Research Lesson 2

Base on the debrief findings for research lesson 1, the team refined the next research lesson. The team included meaningful tasks in the next lesson so that students were able to reflect and relate their knowledge of the lesson. The team decided to improve on the questions in Lab 1B worksheet to help the students to tap on their prior knowledge and experiences. This enabled the students to answer the questions in the Lab worksheet as it was able to draw out the observations and knowledge from the students.

#### 2.3.4.1 Research Lesson 2

The second research lesson covered the use of sensing circuit (real-life applications) with the use of ACE electronics board. The students were required to record their observations in Lab 1B worksheet through structured and scaffold investigative lab work. Students were required to



tap on their prior knowledge on electronics before this research lesson.

Students were told to spend about 15 minutes of their time to complete a simple investigative worksheet together with a “Jig-Saw” activity. The activity allowed students to discuss with their peers the answers of the investigative worksheet 2 through the use of Moodle. However, students were not prepared and they were not able to recall the concepts learnt on the transistor. Thus, a lot of time was spent on this activity on investigative worksheet 2.

The same routines from the previous lesson were in place and each member of the pair had a role to play in the lab work. The Lab 1B worksheet required the students to measure the value of the current passing through the transistor with the use of a multi-meter. This task tapped on the students’ prior knowledge on Ohm’s Law as well as the similar concept on the measurement of the resistance and current values. Students still faced the same issue where they were not sure of what to do for this task in the worksheet.

The teacher conducted a demonstration of the tasks in Lab 1B worksheet before allowing the students to proceed in their pair work. This enabled the students to follow the lesson better as they were able to streamline their thinking processes and took note of the key observations in the Lab worksheet. The students were to draw connections from their prior knowledge and experiences and this helped to prepare them before they started using the Electronics Board for the other tasks in the Lab worksheet.

### 2.3.4.2 Debrief for Research Lesson 2

Observers noticed the students were more engaged in the second research lesson as they were more aware of the requirement of the tasks and the key observations that they had to take note. Students were tasked to predict and answer their answer real-time using Moodle. However, due to the time constraint, the students were not able to complete the lesson and worksheet. Like research lesson 1, students were still not able to answer the 3-2-1 reflection questions at the end of the lesson.

### 2.3.5 Planning for Research Lesson 3

Base on the debrief findings for research lesson 2, the team decided to relook at the questions in for Lab 1B worksheet and refine it for the next research lesson. The observers felt that the lesson was too ambitious. Although there were a lot of meaningful tasks to engage the students, the pace of the lesson was slow for the higher ability students. There was a suggestion to include some

higher order thinking questions to challenge and stretch the higher ability students in the next lesson. The team also concluded that the “summary” part of the lesson could be done through a concept map.

#### 2.3.5.1 Research Lesson 3

The third research lesson was carried out and covered the use of sensing circuit (real-life applications) with the use of ACE Electronics Board. Similar to Lab 1B worksheet, the students were required to answer a set of questions to tap on the students’ prior knowledge on electronics namely transistor. This was carried out on the Moodle platform where students were required to post their answers for the questions in real-time. In addition, the students were required to key their lab findings on the Moodle Forum to streamline the answering of questions. This allowed students to learn from one another as they see their fellow classmates’ answers in real time.

The teacher nominated a pair to demonstrate the connection of the ACE Electronics Board. This provided all the students with the opportunity to learn from this demonstrating pair and not repeat the common mistakes that they usually make when they are connecting the circuit. (e.g. some are unsure on how to connect the wires in the circuit) This helped to remember the connections of the circuit and they also recap how they should connect the multi-meter to get the required readings.

Each student pair was also given a different sensor, either a temperature sensor or moisture sensor, to promote higher order thinking in the lesson. This challenged the students to apply what they have learnt from the theory lessons as they were required to state one real-life application for the circuit that they were tasked to do as a pair. They were also required to draw the circuit diagram and describe how the circuit works when a different sensor is used.

At the end of the lesson, students were tasked to evaluate the hands-on activity and their understanding of electronics through a concept map. The students were guided on how the summary part of the concept map could be done (scaffold instructions). This helped students to understand the use of visual models to summarise their learning of electronics. The students were also required to sum up their learning through the 3-2-1 reflection questions. This time, the students were able to answer to the questions posted to them.

### 2.3.6 Conclusion and Debrief

After the 3rd research lesson, the team sat down to discuss the outcome of the lesson. The team felt the use of the electronic board and Moodle platform was effective as it helped the students to be able to understand better. In addition, the team felt the pace of lesson was able to help the higher ability students and lower ability students to keep up to the pace of the lesson. The use of many hands-on activities was able to retain the students' attention and their passion for learning in class. This motivates the studentsthe desire to do well and try answering higher order thinking questions.

### 3 RESULTSANDDISCUSSIONS

Data were collected via two methods: a survey questionnaire consisting of 20 questions clustered around each of the 3 factors and a semi-structured interview with 6 participants. The 6 participants were picked randomly after the 3rd research lesson study. The former, based on a 4-point Likert scale, provided some quantitative measures that were fully described using descriptive analysis. The interviews, on the other hand, were intended to provide qualitative findings that could be triangulated with the observations derived from the quantitative results. It also gave the team a more in-depth view of the 3 factors.

Clustering the 20 Survey Questions to the 3 Factors, the results are as follows:

Table1:ResultsofSurvey

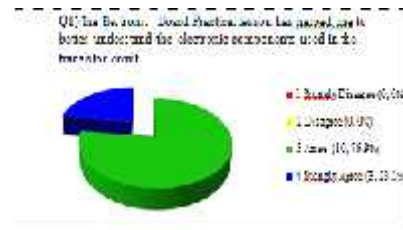
Factor	Average Score (Scale 1-4)	% (n=11)
F1 -Content Type	3.55	87.5
F2 -'Sense of Skills' Knowledge Experience	3.19	77.3
F3 -Goal of Learning Motivation Achievement	3.17	77.3

For F1, one of the leading questions classified under the content type would be question12. It shows a representation of how students access their learning through observation of the workings of the circuits, recognise components better.



The semi-structured interview conducted with 6 students showed similar findings. One of the students, who initially face a lot of problems in understanding the symbols and workings of the circuit and how he was not able to verbalise the workings of the circuit, was able to do so after the usage of the hands-on electronics board. He shared his experience after the ACE electronic board, how it has benefitted him to be able to explain the workings of the circuit, explain the current flow and how the transistor was able to turn on.

For F2, one of the leading questions under the nature of skills/ knowledge/ experience would be question1. Students expressed how Electronic Board Practical lesson has helped students to better understand the electronic components used in the transistor circuit.



When probed during the interview, student A (an academically weak student) shared that the Electronic practical lesson helps them to understand more about the components such as transistors and moisture sensing circuits. In addition, student B (fast learner) felt the lesson was interesting and useful. Similarly, during the semi-structured interview, student C and D (students who have shorter attention span) also added that the lesson is fun, allowing them to explore further beyond the textbook, they get to learn new stuff like connecting the wires of the Electronics Board, observe the workings of the circuit and how they can use the knowledge that they have learnt to understand real life applications.

For F3, the key leading question would be question 10, classified under the Goals of learning situation & assessment. Students expressed how Practical lesson has helped me to rate their understanding the electronic components and ability to handle them.



In the semi-structured interview, some of the students shared their before and after experience of using the ACE electronic board. They initially faces a lot of problems in understanding the workings of the circuit and identifying electronics components in a circuit, was able to form links between the circuits learned and real-life applications after going through the ACE electronic board with the worksheets. This has helped them greatly to be able to rate their understanding of the Electronics topic.

In general, all students agreed that they were engaged in the activities of the lesson and were able to make connections between past and present learning experiences. The students were also able to actively explore the activity and verbalise their understanding of the concepts learnt by explaining the formal terms used in the lesson. Besides this, the electronics board has also enabled students to elaborate and extend their conceptual understanding and allows them to practice skills and behaviours. Lastly, students were able to assess their understanding and abilities through concluding activities such as 3-2-1 self-evaluation and the concept map. The research lesson studies allowed students to build their own understanding of new ideas and promoted self-directed learning (SDL) and collaborative learning (CoL).

To better appreciate the impact of engaging the 3NT Students in the Learning of Electronics through the ACE Electronics Board, the Lesson Study team also adopted “Seven ways used by teachers to support meaningful learning” to analyse the survey results. Prof Linda Darling Hammond suggests that the students learn more deeply and perform better on complex tasks if they have the opportunity to engage in more “authentic” learning—projects and activities that require them to employ subject knowledge to solve real-world problems. This was evident in the research lesson as students were engaged and excited to use the Electronics Board. The use of experiential learning has also allowed students to think vigorously and draw parallels beyond the classroom (real life applications). They were able to observe the different types of sensing circuits’ effects first hand (buzzer, light bulb, etc.) and the lively exchange between teacher and students have certainly enhanced the entire learning experience.

#### 4 CONCLUSIONS

The results showed evidently that the 3NT students were engaged in the learning of electronics through the ACE Electronics Board. Engaging the students through experiential learning has shown its effectiveness as the students were engaged in fun and enjoyable lesson through the hands-on teaching and learning activities with the use of the ACE Electronics Board.

The use of the RLS package received favourable feedback from the students as shown in the table of results from the survey substantiated by the interview of the students. The choice of appropriate teaching strategies enabled the team to craft lessons that were both structured and guided and provided scaffold in instructions to students. A good mix of hands-on activity with the use of observations in the lab worksheets provided meaningful interactions between the teacher and the students.

Overall, the use of the ACE Electronics Board in the teaching of Electronics has created a positive impact on the students’ attention and engagement level. Through the surveys and interviews, 3NT students have found the teaching package to be enjoyable and engaging. Teachers involved in the administering of the teaching package have found it to be beneficial and effective for students. The regular PLT sessions have also enhanced pedagogical knowledge among teacher members. The overall effectiveness and value of the package suggests that the package should be rolled out to subsequent cohorts of 3NT students so that they could also reap the benefits from the package.

#### 5 IMPLICATIONS

The team will extend the learning by tweaking the Sec 3 NT SOW to infuse the current RLS package into the coursework process to expose students to real design situations or needs relating to ‘electronics’ – design journal process and making in preparation for 4NT. The RLS package will also include HOT questions relating to everyday life.

In the everyday lessons, students are also taught to be more empathetic and sensitive about user needs and environment during designing and making of their product. Besides being an active contributor in the classroom, students are also encouraged to be concern citizen who identify needs of users in authentic learning environments.

Lastly, the use of ICT in lessons enhances the learning experience and makes the lesson more fun and enjoyable. With the aid of ICT, teachers are

able to receive instantaneous feedback during lessons. Students are also able to collaborate with each other to build their own understanding of new ideas to solve real-world problems.

## 6 REFLECTIONS

Through the numerous discussions and planning, the members have found the PLT immensely useful for them to gain new insights into the behaviour, traits and learning aptitudes of 3 NT students. While it was obvious that NT students require more scaffolding, hand holding and guided instructions in small chunks, the first PLT lesson was found to be of inadequate level for NT students despite having simplified it to suit their level. In addition, the importance of how classroom dynamics need to be engineered has left a deep impression on all PLT members. The observations of classroom dynamics (and related aspects such as tone of classroom, routines, obtaining of feedback and lesson instructional strategies) were instrumental for the success of lessons for Normal technical students.

It provides teachers with the platform to explore new ideas for improving the current teaching and learning resources to meet the needs of the students. ~ Chen Xinyi.

The lesson study provides teachers with the opportunity to create and design teaching resources by examining the students' thinking, understanding and learning. ~ Wilson Tay.

The research lesson could only get better with each consistent and subsequent review of each lesson with the team to list out the positive points and areas for improvements that might arise in the lesson. ~ Salahudeen

The entire duration of the lesson study also enables teachers to collaboratively plan a lesson and helps teachers to think about areas that one may not do so when planning alone. ~Tan Peng Yau

This entire process is insightful and beneficial as teachers witness the responses of the students while they worked through the tasks in the learning process. ~ Hafiz & Sahri

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*Guru (KM) : "Iya ada perbedaanya, namun saya juga melihat saya masih lemah untuk mengajak siswa diskusi setelah saya meminta siswa ke depan untuk mempresentasikan hasil yang telah mereka buat. Jadi kurangnya diskusi kelas ya, aa anaknya".*

*G(KM) : "Terus siswa tidak lagi banyak mengalami kesalahan dalam prosedur karena mereka yang memprediksi sendiri hanya saja dengan seperti itu mereka belajar kesalahan yang mereka lakukan ketika prediksinya tidak sesuai dengan yang mereka lakukan".*

Based on series of eight lessons, teacher make self-reflection by using lesson analysis framework in each lesson. Teacher self-reflection can impact from one lesson to another lesson to give improvement for learning process. This study was gained teachers self reflection about concept' affirmation in apperception, time management, and experiment procedures.

#### 4 CONCLUSION

By using lesson analysis, teachers make reflection of learning process, understand the effectiveness and quality of learning and finding effective ways to help students for developing their competence. Teachers can solve their learning problems that occurred with more detail. Thus, that caused improvement and enhancement of learning knowledge. In addition, teachers also find appropriate learning materials for certain materials due to more complete picture of the obstacles and progress that occurs in the classroom. Then teacher will get a variety of new knowledge to implement their learning process better, through preparation, material domination, attitudes, and problem solving. This is in accordance with the opinion of Santagata and Angelici (2010) states that the framework lesson analysis designed to assist teachers in learning to reflect success in teaching. Lesson analysis gives teachers a variety of views to observation, reflection, and the study of learning in the classroom.

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ARTICLE

**KNOWLEDGE MANAGEMENT MODEL IN  
MANAGERIAL COMPETENCE DEVELOPMENT  
FOR SMALL INDUSTRY BUSINESS  
AT WEST JAVA PROVINCE, INDONESIA**

By

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**ABSTRACT**

*This research was focused on the gaps of the capability of managerial competence among small industry holders at the province of West Java. There are many influencing factors to this managerial competence capability and this research was conducted to identify those factors and formulate an appropriate managerial competence profile for small business holders at West Java province.*

*The Soongsatitanon Theory about the factors of managerial competence was adopted in this research and so the other which was appropriate.*

*This research was conducted with quantitative approach by using the survey method and data analysis technique of MSA (Measure of Sampling Adequacy) factors analysis, to determine analyzed variables by Bartlett test of sphericity method. Research population includes all of small industry holders at West Java Province (198.478 small industry business). Research samples was determined by cluster random sampling, which will represent West Java Province, divided into 4 regions. Those are : Region 1 was represented by Sukabumi Regency, Region 2 was represented by Purwakarta Regency, Region 3 was represented by Cirebon Regency and Region 4 was represented by Bandung Regency with the amount of responses is 400.*

*The result of this research was dividing the condition of small industry holders at West Java Province into 3 parts, those are technical skill, human relations skill, and conceptual skill. Technical skills includes the lack of management knowledge understanding and technology application into their business. Human relations skill includes the lack of existing human resources development and motivation improvement to enhance human resource capability. Conceptual skill includes the lack of capability to identify, analyze and solve the problems, which had made weakness of competitive ability facing globalization era.*

*Managerial competence was formulated by 9 factors as stated by Soongsatitanon (2006), where those factors show high value to influence the managerial competence of small industry holders at West Java Province. Those are : understanding and designing business model (0,805), having advance future vision (0,782), systematic thought (0,765), capable to integrate and manage the resource (0,449), risk management (0,537), idea marketing (0,579), stakeholder management (0,541), lead and manage changes (0,734), developing human resources and value improvement (0,702).*

**Keywords : managerial competence, small and middle industry**

### A. Background

Small and Middle Industry activities have important role in every national economic activities, especially its role when Indonesia faced economical crisis, to hold society economical and social resistance. Their existence were holding big economical hopes especially as people income sources.

The amount of micro, small and middle industry business (UMKM) is the majority of business in Indonesia. There are about 50 millions business units of UMKM in Indonesia or 99% of total existing business units. From all UMKM units, recording to the Cooperative and Small & Middle Industry State Ministry (Kementerian Negara Koperasi dan UKM (source : BPS Provinsi Jawa Barat No. 18/05/32/Th. XI, 15 Mei 2009), the majority is micro business with the amount of 47.702.310 units or nearly 95% more. Small industry unit is about 2 millions units, and Middle Industry is about 120.000 units. Big industry is only about 4.527 units or about only 0,01%. With this huge number, it is clearly that small business take very strategic position in national economy in Indonesia.

Similar composition is revealed in many countries. For example in Japan, at 2007 the amount of small and middle industry reached 4,69 millions units (99,7%) compared with big industry which only about 13 thousands units (0,3%). Small and Middle industry in Japan had absorbed 30 millions employees (70,2%), while big industry absorbed 13,7 millions people (30,5%). The value of small and middle industry export reached 137 billions yen (51,1%) and big industry had about 131 billions yen (48,9%). It is reflected that small and middle industry had been main strong foundation of Japan economy.

In Thailand, although small and middle industry had not yet roled as main contribution, but it had contributed

significantly to export value which had reached 26,5% from total national export value. Small and middle industry in Singapore had contributed 47,5% of export, while in Malaysia reached 20 %.

In Indonesia, although the amount of small and middle industry units reach 99%, but the contribution to export values in 2003 was only 19%. It showed that the development of small and middle industry in Indonesia was slow.

According to Provincial Statistical Berau (BPS Provinsi Jawa Barat No. 18/05/32/Th. XI, 15 Mei 2009), low contribution of small and middle industry to export value reflected low capability of them. Generally, there are two main problems. First, financial problem and second, non-financial problem (management organization). Financial problems include :

- In-appropriate of available and accessible fund by UKM
- There no systematic approach to funding programme for UKM
- High transaction fees, because of very complicated credit procedure which takes much times for small fund
- Lack of access to formal funding sources, because of either lack of banking network at remote area, nor suitable information.
- High margin for investment and capital
- Un-bankable small business holders because of there are no transparency in financial management and lack of managerial and financial capability

The problems of management organization (non financial problems) include :

- Lack of information on production technology and quality control process, because of minimum chances to follow the technology development and lack of education and training.

- Lack of information on marketing because of limitation of accessible information by UKM regarding global market, also because of the low capability of UKM to provide product or services by market demand.
- Lack of human resources with appropriate skills.
- Lack of understanding to financial and accounting knowledge
- Limitation of business network for co-operation between small industry holders (marketing information system)

Almost all non-financial problems of UKM are oriented to low knowledge and managerial competence of small business holders. According to Statistic Center Berau, the small and middle business holders are graduated from Elementary School (70 %). In the other side, knowledge plays very important role for company improvement. The more advanced of company's and human resource's knowledge, they will get better competitive ability to enter global market.

One of important effort to enhance capacity and competence of small business holders is to improve their capability on science and technology, which are appropriate for their productivity and strengthening their competitive ability. With the trend of highly competitive business, technology development, dan customer's need improvement, the success of small and middle industry business will be determined by how they can develop themselves to become a learning organization for business innovation and managerial competence development. Therefore we need *knowledge management*, as an effort to identify, organize, develop and implement knowledge.

In every study regarding implementation of *knowledge management* in industry and organization, the conclusion is that the implementation of *knowledge*

*management* contribute positive influence to increase capability and competitive ability of the industry or organization itself. However, the implementation of *knowledge management* in small and middle industry at Indonesia is very limited. This is because of minimum study, research and model development for *knowledge management* implementation in small and middle industry sectors. This is why researchers determine the topic for this research.

## **B. Literature Study**

The discussion of *Knowledge management* (KM) was begun after the publishing of articles from Ikujiro Nonaka, titled *The Knowledge Creating Company* at Harvard Business Review, in 1991. This study was correlated with previous article from Peter F. Drucker, a management expert which oftenly called as modern management pioneer in 20<sup>th</sup> century, titled *The Coming of the New Organization* in 1988. KM had became important concept in management and scientific study topic. The implementation of KM in many multi-national companies had contributed positively to the concept development as important concept to be implemented in organization, to reach goals effectively and efficiently. (*Takwim*, 2008)

KM was first related specially to business by Tom Davenport in 1998 with his bestseller-book, *Working Knowledge: How Organizations Manage What They Know* published by Harvard Business School Press. By this book, Davenport can be acknowledged as pioneer of '*business knowledge management*' and motivate the business world to KM.

There are many studies related to big companies those implemented KM. The result is that the effectivity of KM was founded in big companies those had implemented KM. the analysis showed that implementation of KM in many big companies contributed to effectivity and efficiency of KM, to increase the



company's work and income. In the book *The Knowledge management Toolkit* published by Prentice Hall PTR, Amrit Tiwana (1999) quoted by Takwim, it is shortly described the results of some studies include study at airplane industry Rolls Royce, computer software company Platinum Technology Inc., consumption technology company Nortel Corporation, semi-conductor telecommunication company GaSronics and Texas Instruments, also medicine and nutrition company Monsanto. Tiwana showed the description of KM implementation and its effect to company work improvement, described by its production and sales. (Takwim, 2008)

KM is based on basic idea that the most precious resources in an organization is knowledge of people in the organization itself. This is not a new idea, because organization also means managing human resources. The new concept of KM is that focus of management is "knowledge". This focusing aspect is forced by the changes acceleration in business world dan development of global economy into the new era called "knowledge economy era".

There are many definitions of Knowledge management from many sources, but according to Bergeron (2003: 8), knowledge management was defined as: "Knowledge management (KM) is a deliberate, systematic business optimization strategy that selects, distills, stores, organizes, packages, and communicates information essential to the business of accompany in a manner that improves employee performance and corporate competitiveness.

Rao (2004:3) in *Knowledge Management Tools and Techniques*, defined KM as: "Knowledge management is a systematic discipline and a set of approaches to enable information and knowledge to grow, flow, and create value in an organization.

From some definitions of some

sources, it is concluded that KM is a system to create, collect, organize, distribute, and use knowledge in organization or individual, purposed to increase learning process and organization performance.

*Managerial Competence* is knowledge and capability those related with managerial capability needed to handle organization's tasks.

Refers to identification by Katz (1974) in Harvard Bussines Review, it is still believed there are 3 essential managerial skills: (1). *technical skill*, which is the capability to use knowledge and certain skill; (2). *human relations skill*, is capabality to interact, work, undertand and motivate the other person, individually or in group, and (3). *conceptual skill*, is mental capability to analize and diagnose a complex situation.

While Soongsatitanon (2006), stated there are 9 factors in managerial competence, include: (1) Understand and capable to design business model; (2) Have advance future vision; (3) Systematic thoughts; (4) Capable to integrate and manage resources; (5) Risk management; (6) Marketing idea; (7) Managing stakeholders; (8) Lead and manage changes; (9) Develop human resources and value improvement.

There are many definitions regarding small industry in Indonesia's Law, in *Undang-Undang No. 20/2008* about *Usaha Mikro, Kecil, dan Menengah*, Small Industry was defined as business which meet criterias such as : a) Own nett asset more that Rp. 50.000.000,00 (fifty millions rupiah) to the maximum of Rp 500.000.000,00 (five hundreds millions rupiah) excluding properties used as business house; or b) Have yearly omzettes more that Rp. 300.000.000,00 (three hundreds millions rupiah) to the maximum of Rp 2.500.000.000,00 (two billions and five hundreds millions rupiah); c) Independent, not as branch or company

expand owned, controlled or become direct and or indirect part of middle or big industry, and d) Forms individual business, informal or formal business company including co-operative.

According to data in Provincial Office of Co-operative, Small Industry and

Trading (Dinas Koperasi, UKM, dan Perindustrian Perdagangan Jawa Barat), the matrix of industry condition at West Java Province including classification, business unit amount, employee absorbance and investment from 2005 to 2007.

**Table 1**  
**Industry Condition at West Java Province**

Sektor Industri	Tahun 2005			Tahun 2006			Tahun 2007		
	Unit Usaha	Tenaga Kerja	Investasi (Rp)	Unit Usaha	Tenaga Kerja	Investasi (Rp)	Unit Usaha	Tenaga Kerja	Investasi (Rp)
Besar	276	3.176	40.861.696.000	84	7.602	567.821.273.372	95	8.498	615.949.973.177
Menengah	30	1.082	22.495.068.000	104	4.714	83.735.267.587	146	5.660	106.463.267.242
Kecil	30	2.242	72.666.882.000	1.588	2.675	235.609.189.321	2.880	48.246	263.990.568.136
Total	336	6.500	136.023.646.000	1.776	14.991	887.165.730.280	3.121	62.404	989.403.808.555

Source : Dinas Koperasi UKM dan Perindag Jawa Barat

### C. Methodology

Research method used in first year is *explorative survey with quantitative approach*. The research subject includes small industry holders located at West java Province. Research instruments are poolings, interviews guideline and focus group discussion. Data analysis conducted quantitative analysis based on existing data group. Quantitative data analysis technique used SEM Anaylisis, with the SPSS computer programme support.

Overall, in 3 years of activities, this research used R & D method, through 4 D steps which are: *define, design, develop and disseminate*. *Define* and *design* steps were conducted in first years with the support of SPSS programme. In the second year, the research were directed for *develop* knowledge management model.

The results from first and second year had been followed up in the third year with *disseminating* step and implementing knowledge management model, also designing management information system that will support small industry holders understanding in West Java Province.

In the first year, we conducted managerial competence profile mapping of

small industry holders. This map will be used as basic input in designing knowledge management model, to develop managerial competence for small industry holders, based on literature study, field observation and focus group discussion, to determine an appropriate model suitable to small industry characteristics.

Refer to the research goals, the indicators or achievement parameters from this research are:

- a. Managerial competence on small industry level at research area West Java:
  1. Managerial competence existed at this time in small industry holders;
  2. Problems of managerial competence faced by small industry holders
- b. Concept and understanding of knowledge management:
  1. Identify the implementation of knowledge management by small industry holders at West Java;
  2. Define the principles and knowledge management model form in developing managerial competence for small industry holders;
  3. Formulation of knowledge management model in developing

managerial competence for small industry holders;

4. Design of management information system to support the implementation of knowledge management for small industry holders.

Along with the goals and indicators/achievement parameters, therefore the output of this research in first year is description about managerial competence profile of small industry holders at West Java Province.

The research population includes all registered small industry holders at Industry and Trading Associate of West Java (KADIN). Based on data in 2009, the population reached 198.478 units of small industry business.

Research sample was based on *cluster random sampling*, which was determined the representatives of West Java region, divided into 4 area:

- Region 1 was represented by Sukabumi Regency,*
- Region 2 was represented by Purwakarta Regency,*
- Region 3 was represented by Cirebon and*
- Region 4 was represented by Bandung Regency*

**D. Results**

Small and middle industry was identified as culinary and handycraft sectors. Based on data from Provincial Office of Co-operative, Small Industry and Trading (Dinas Koperasi, UKM, dan Perindustrian Perdagangan Jawa Barat), the matrix of industry condition at West Java Province including classification, business unit amount, employee absorbance and investment from 2005 to 2007.

This research was focusing on research goals which is the problem related to Managerial Competence faced by small industry holders. Managerial Competence is thre knowledge and capability related with many managerial ability those are needed to solve organizational tasks. In their business, those industry holders must have suitable capability.

The results from field obervation and data analysis, it could be described as follow : based on the table of *Rotated Component Matrix*, it is revealed the difference correlation between 9 research variables in *Managerial Competence* research, into 2 groups of factors, concluded in the next table :

**Table 2  
Rotated Component Matrix**

item	Factor loadings	Component
X <sub>1</sub>	0,805	1
X <sub>2</sub>	0,782	1
X <sub>3</sub>	0,765	1
X <sub>4</sub>	0,449	1
X <sub>5</sub>	0,537	2
X <sub>6</sub>	0,579	2
X <sub>7</sub>	0,541	2
X <sub>8</sub>	0,734	2
X <sub>9</sub>	0,702	2

Therefore, the 9 research indicators for *Managerial Competence* research variables, was reducted into 2 dominant factors :

1. Factor 1 includes variable : X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>, X<sub>4</sub>
2. Faktor 2 includes variable : X<sub>5</sub>, X<sub>6</sub>, X<sub>7</sub>, X<sub>8</sub>, X<sub>9</sub>

Which :

X<sub>1</sub> = understanding and be able to design business model

X<sub>2</sub> = having advanced future vision



- X<sub>3</sub> = systematic thoughts
- X<sub>4</sub> = be able to integrate and manage resources
- X<sub>5</sub> = risk management
- X<sub>6</sub> = idea marketing
- X<sub>7</sub> = stakeholders management
- X<sub>8</sub> = lead and manage changes
- X<sub>9</sub> = develop human resources and value improvement

Managerial Competence is formed by 2 dominant factors such as internal and external factors. The internal factors relies inside the businessman character, including X<sub>1</sub> = understanding and be able to design business model, X<sub>2</sub> = having advanced future vision, X<sub>3</sub> = systematic thoughts and X<sub>4</sub> = be able to integrate and manage resources. External factors are important capability that a businessman must have. This external factors include X<sub>5</sub> = risk management, X<sub>6</sub> = idea marketing, X<sub>7</sub> = stakeholders management, X<sub>8</sub> = lead and manage changes, and X<sub>9</sub> = develop human resources and value improvement.

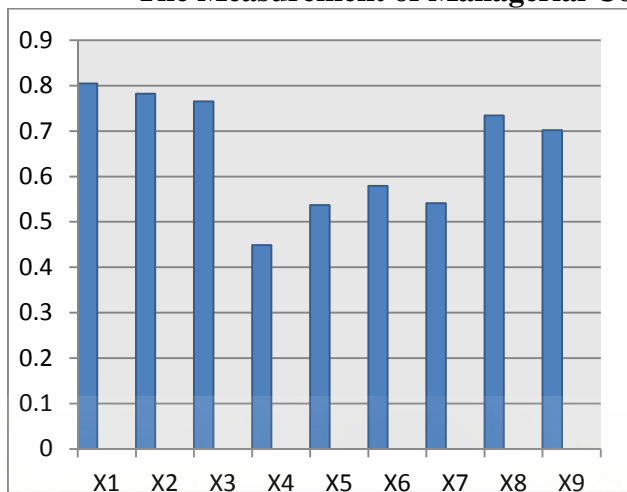
Based on above discussion, the real problem related to managerial competence of small industry holders at West Java are divided into 3 parts as follow : *technical skill*, *human relations skill*, and *conceptual skill*. Problems on technical skill include lack of understanding to management knowledge and technology application on running business. The

problems of human relations skill include the minimum development of existing human resources and lack of motivation to improve capability. And the problems of conceptual skill include low capability to identify, analyse and solve problems which are causing the weakness of business competitive ability, facing globalization era.

Managerial competence was formulated by 9 factors as stated by Soongsatitanon (2006), where those factors show high value to influence the managerial competence of small industry holders at West Java Province. Those are : understanding and designing business model (0,805), having advance future vision (0,782), systematic thought (0,765), capable to integrate and manage the resource (0,449), risk management (0,537), idea marketing (0,579), stakeholder management (0,541), lead and manage changes (0,734), developing human resources and value improvement (0,702).

**Table 3**

**The Measurement of Managerial Competence Forming Factors Value**



- X<sub>1</sub> = understanding and be able to design business model
- X<sub>2</sub> = having advanced future vision
- X<sub>3</sub> = systematic thoughts
- X<sub>4</sub> = be able to integrate and manage resources
- X<sub>5</sub> = risk management
- X<sub>6</sub> = idea marketing
- X<sub>7</sub> = stakeholders management
- X<sub>8</sub> = lead and manage changes
- X<sub>9</sub> = develop human resources and value improvement

Based on the result of this research, the important follow up to develop

managerial competence is knowledge management. Therefore this result will be

referred for knowledge management study that will support managerial competence factors.

Refers to the identification from Katz (1974) in Harvard Business Review, there are 3 essential managerial skills such as : 1. Technical skill, the capability to use certain knowledge and skills; 2. Human relations skill, capability to interact, work, understand and motivate other people, individually or in group; and 3. Conceptual skill, the mental capability to analyze and diagnose complex situation.

The analysis of field observation findings reveals that problems of managerial skills faced by small industry holders are related to those stated by Katz. In technical skill, small industry holders at West Java have weakness in knowledge and implementation of management and technology to support their business development, while this skill is the basic capability for small industry holders. At the other side, they still have lack of understanding to good management in their business such as organization structure, clear work procedures, also capital and income management. Beside those, the application of simple technology and use of traditional method are obstacles for them. This is influencing on the product that is worst than those using recent technology.

In human relations skill, small industry holders at West Java are lack of capability in human resources management in their business environment. Employee development to improve skills, especially in technology application is very low. Motivation given in minimum effort without continuous control and real follow up, such as rewards for employees for examples: bonus on good performance or staff promotion.

Conceptual skill became next problem for small industry holders at West Java. They lack of capability to identify, analyse and solve problems so they do not have understanding of recent market demands. The unsolved globalization effects have also affected to small industry

development at West Java and very low competitive ability.

The conclusion of research shows that global problems related to managerial competence are lack of understanding and identifying type of capability those are important for businessman to run his business. They usually learn from their experiences, and some are only hope from their fortune. They hold only on capital to run business, while in reality, a company with a manager who understand and apply managerial skills could develop better than those without managerial skills.

### **E. Conclusions**

The real problem related to managerial competence of small industry holders at West Java are divided into 3 parts as follow: *technical skill*, *human relations skill*, and *conceptual skill*. Problems on technical skill include lack of understanding to management knowledge and technology application on running business. The problems of human relations skill include the minimum development of existing human resources and lack of motivation to improve capability. And the problems of conceptual skill include low capability to identify, analyse and solve problems which are causing the weakness of business competitive ability, facing globalization era.

Managerial competence was formulated by 9 factors as stated by Soongsatitanon (2006), where those factors show high value to influence the managerial competence of small industry holders at West Java Province. Those are : understanding and designing business model (0,805), having advance future vision (0,782), systematic thought (0.765), capable to integrate and manage the resource (0,449), risk management (0,537), idea marketing (0,579), stakeholder management (0,541), lead and manage changes (0,734), developing human resources and value improvement (0,702).

The recommendation of this research to those who concern are:

1. The government via Ministry of Industry and Trading in national or regional level should support the industry holders to develop their business, understand and applicate managerial competence and have competitive ability in global market.
2. Educational institutions with purposes to make bright people of this nation, are hoped to transfer management knowledge and managerial competence to industry holders, to increase understanding and application of knowledge in early steps and produce well-educated businessmen.
3. The business holders who has important roles to improve national economy, must have willing to improve managerial competence to increase competitive ability in global market, and also proactively participate in knowledge and skill improvement activities from government or educational institutions.

Based on above recommendation, the implication of research will be proposed as follow:

1. The government must increase the dissemination of capital allowance for small industry holders, providing the training of managerial competence development for small industry holders and constructive control and assistance to business holders from beginning and its development.
2. Educational institutions give more education about managerial competence for business holders through seminars or trainings, and also support research on managerial competence which will support small industry sectors to solve their problems.
3. Business holders contribute and participate in seminars and trainings provided by government or educational institutions to improve knowledge and managerial competence, also to develop themselves by looking for knowledge on managerial competence via all media.

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**Teacher-Student Collaboration in Solubility Product Constant and Colloid Concept in Chemistry Learning of Senior High School**

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**Abstract:** The tendency of low interaction between teacher and student became the background of this study. The aim of this study is to analyze teacher-student collaboration in solubility product constant and colloid concept of chemistry learning. The subject of this research were one chemistry teacher and 27 students of XI IPA 2 SMA Laboratorium UPI. The type of this research was descriptive qualitative. The instrument that used in this research were observation sheet, video recorder. Ten times lessons were recorded by handy-cam and observed using observation sheet, and then made lesson transcript based on video lesson. Teacher and student's responses and questions analyzed using Hendayana lesson analysis framework to see the collaboration between teacher and student to improve pedagogical competence of teacher. The result of this research showed that the tendency of teacher response in solubility product constant lesson were INT (teacher interruption in group asking result and progress), MMR (teacher asking student to do something/procedure) and LJW (teacher answer student question directly). The tendency of teacher response in colloid lesson were MMR (teacher asking student to do something/procedure), LJW (teacher answer student question directly), and RPI (teacher answer by scientific question). Lesson analysis can be used to improve pedagogical competence of teacher especially to answer and response student's question and answer. It is importance for teacher to increase scientific question and reduce interruption to increase teacher-student collaboration.

**Keywords:** teacher-student collaboration, solubility product constant, colloid, chemistry learning

## 1 INTRODUCTION

In education there is interaction between learners and educators, the interaction of learners and educational resources that can take place in a situation of education, teaching, training, and guidance (Sukmadinata, 2006: 24). The importance of interaction between learners with educators will affect the learning process that can improve the quality of learning. To improve the interaction among students and student-teachers honed through experience and the establishment of collaborative learning community, that can be the vision and philosophy of the school reform. Learning community guarantees the right of every child's learning without exception, improving the quality of learning and the simultaneous achievement of quality and equity of learning but not only students but also teachers in the classroom (Sato, 2012: 19). Teachers collaboration to plot or no plot other subjects in order to improve the quality of learning to form a learning community. In the activities of learning community, according to Sato (2012: 19) there are three systems of collaborative learning in the classroom which are professional learning community and collegiality in the staffroom and participation of parents and communities. Building the learning community is to build a culture that facilitates its members to learn from each other,

mutual correction, mutual respect, mutual trust, mutual restraint ego. Building a culture of no moment, take a long time.

According to Vygotsky (1978: 32) the process of learning can occur in two phases: the first phase occurs when collaborating with others, and the second stage is done on an individual basis in which a process of internalization. During the process of interaction among teacher-students and among students, the following capabilities should be developed: mutual respect, test the truth of the statement the other hand, negotiate, and each adopted the idea that developing. The first stages of learning Vygotsky was started by a student who could not solve the problem alone, and then he had to ask the other students (Masaaki, 2012: 29). Teachers should be able to enable students to each member actually has a role in the group.

Each group should be given the opportunity to think for themselves, to work alone without any intervention from the teacher, if students are having difficulties, there will be collaboration between them. Thus, there will be a good and close relationship so that each student will be free to think and absorb the material without too much under pressure. The system can encourage students to collaborate for mutual learning (mutual learning) in

the classroom learning community in the learning community (Hendayana, *et. al.* 2013: 12).

Learning occurs when children work or learn to handle tasks that have not been studied, but the tasks are still within range of ability or the task is in the Zone of Proximal Development (ZPD / region proximal development) (Vygotsky, 1978: 34). The zone of proximal development is defined as the distance between the actual development and potential development. Vygotsky believes that higher mental function in general appears in the conversation on cooperation between individuals, before the higher mental functions were absorbed into the individual. How long it takes to build a culture of learning community has no limits (Hendayana, *et. al.* 2013: 11). In a learning community, communal reflection takes place so that the teacher can see for themselves how the learning is done during the learning process.

Lesson analysis developed by several experts including lessons according Fernandez analysis where the analysis focuses on teacher learning and student responses in learning. Previous lesson development analysis focussed on students in the learning phase. Matsubara's lesson analysis by focusing on the student's response and analysis by Hendayana and Hidayat lesson focuses on the interaction of teachers and students' responses (Hidayat, 2013: 7). In this study, researchers used variant of lesson analysis developed by Hendayana and Hidayat, this because in accordance to the characteristics of the class in Asia for self-reflection in order to identify the teacher-centered to student-centered.

In the subject matter that must be studied colloidal students, especially students of class XI second half, has the characteristics of a concept based on the concrete meaning can be expressed in real life, especially the application of the concept of colloid in everyday life, but also has the characteristics of colloidal material abstract with concrete examples. Students should be easier to understand this matter, but in fact the students have difficulty in understanding the colloidal material associated with many concepts and examples, as well as not being able to build relationships between existing concepts (Mutiasari, 2011: 3). Same with that said Oktariani (2011: 2) that, in the students' learning colloidal material has been unable to reconstruct the concept and the learning process is still dependent on the student's ability to memorize briefing information is then followed by doing exercises without being followed by the ability to understand the information that is memorized and connect with everyday life. This makes students' understanding of the material be comprehensive. Many students struggle to study chemistry, but often to no avail. This is because many of them do not build a proper understanding of the basic concepts of chemistry based on the educational experience of

students (Nakhleh, 1992: 192). The learning process chemicals also tend to emphasize aspects of any product without any aspect of the process. The nature of chemistry not only covers aspects of the product just like hooking facts, concepts and principles of chemistry. Chemistry is essentially also a process that involves scientific process skills and attitudes that are useful to acquire and develop knowledge of chemistry. In chemistry learning process, students and teachers involve in a series of activities in the order: observing phenomena and learn the facts, understand the models and theories, develop reasoning skills, and test chemical epistemology (Ahmad and Baradja, 2012: 6). One success key of the learning process variable is a qualified teacher. Teacher as educator is the figure who most associate and interact with the students compared to other personnel in the school. The teacher is responsible for planning and implementing the learning process, assessing learning outcomes, conduct guidance and training, conduct research and studies, and open communication with the public. Background of the above problems to tackle the problem, then it is time for teachers to try to make learning more fun in class two-way communication between students and teachers. So that students liked the chemistry lesson without being burdened with the collaboration of teachers and students in the material solubility product and colloidal systems in chemistry learning.

## 2 RESEARCH METHOD

Research method that is being used in this research is descriptive qualitative research methods. This research is focused on study about student-teacher collaboration on the solubility product constant and colloid concept in chemistry lesson. The research was conducted in there steps: 1). Analyzing instructional videos about solubility product constant and colloid concept in ten times of learning; 2) Analyzing the learning transcript's videos based on implementation in learning for student's responses analysis and anticipating teachers to the student's responses; and 3) Analyzing learning process based on the Hendayana's model framework to analyze the characteristics of collaboration among students and students-teachers. Subject on this research is students SMA Laboratorium Percontohan UPI class of XIIPA2, year 2013/2014 as initial respondents. There are a chemistry teacher and five researchers who becoming the observer. The instrument that used in this research consist of three kinds instruments: (1) Observation sheets, (2) Handycam, (3) Lesson analysis sheets. This observation sheets is done to obtain direct interaction between teacher and student, interaction and participation students during learning process. In addition, it is to obtaining the data and the facts about the difficulties of respondents in concept of



chemistry related to solubility and colloidal system of subject matters. Patterns of interaction and participation present on the format of observations. This format is referenced from research conducted by Dukmak (2009:271).

According to Hendayana (2013:9), lesson analysis is a method that is used to analyze the characteristic of learning process in the class in Indonesia, characteristic of interaction in the classroom with a student-centered learning and more to teacher self-reflection. In addition, according Matsubara (2012:40), lesson analysis is a method for analyze the learning process by using transcript that focus on students responses and learning situation.

Verbal data will be transcribed into written data. All the entire lesson videos that was recorded during implementation of learning process transcribed and refined to obtain the basic text from learning process that was observed. That basic text later used in coding step to obtain data of learning activities, interaction among students, interaction between students and teachers that would be appears during implementation study of solubility product constant and colloid subject.

### 3 RESULT AND DISCUSSION

The result of this research shows learning process that has done in solubility product constant and colloid subject matters based on Hendayana lesson analysis framework focus on analyzing the collaboration between students and teachers on the group session. The first lesson shows that the interaction and collaboration of teacher-student not good enough, it can be seen from the results of analysis lesson. Interaction is mostly done when the teacher-student grouping session is, the categorization LJW have not seen teachers interact with students. It can be seen from the following photo.



Figure 1. Teachers answer student's question directly.

In the second study was increasing and the difference pattern teacher-student collaboration is evident MPR from the frequency 81 categorization, categorization RPI occur with 61 frequency that is pretty good compared to the collaboration of The first lesson but still not significant.

In the third study in group interaction and collaboration sessions conducted teacher-student

looks more to the MPR categorization of the frequency 58. This shows that based on the results of this analysis lessons seen an increase in the pattern of teacher-student collaboration on categorization RPI where teachers more 31.

In the fourth lesson, the common ion effect and the effect of ph on solubility concept did not shift the pattern of interaction and collaboration are very significant, but the reduction of the pattern in which the teacher so teachers can do self-reflection on the categorization LJW of the four learning collaborative learning has yet trend still teacher-centered learning.



Figure 2. Teacher answers students question through scientific question.

In the fifth and sixth learning increased teacher-student interaction patterns are caused by the MPR characteristics of the material colloidal system is enough to give a fairly good collaboration patterns and students are doing and find experiment result without always guided teachers that learning tendencies already towards student-centered.

On learning the seven visible increase teacher-student interaction patterns on TPS categorization with frequency LJW categorization and the increased MPR and RPI, but generally occur fairly good collaboration between teachers and students in learning so that learning more focused on the students (student-centered). This is evident from the way students interact in a group when the presence of the teacher involved.



Figure 3. Teacher does interruption for students observation result.

In the eighth study showed an increase and shift pattern of significant collaboration on the categorization of the Assembly with the RPI, but the frequency of INT and MJL category sodium absorption ratio change significantly and includes patterns of interaction and collaboration are rarely performed teachers.

In learning to nine looks learning has been highly increased more significantly in the presence of a more effective learning between teachers and students where the teacher is to answer the questions asked by the students to return scientific questions for this is the level of teacher-student collaboration categorization is quite high.



Figure 4. teachers instruct students to do something procedures

On the tenth learning occurs collaboration and interaction is excellent between teacher-student learning so that trend more towards student-centered with the categorization of MMR and the RPI is still increasing and categorization LJW and INT were increased also in the last lesson of 10 times the learning undertaken by of the transcript of the video, the lesson by lesson analysis Hidayat & Hendayana occur fairly good collaboration between teacher-student.

#### 4 CONCLUSIONS

Lesson analysis could be used to increase the competence of teacher's pedagogy, especially to answer student's question and making anticipation for student's responses. This is important to teachers to develop any scientific questions and limit the interferences thus, collaboration between teachers and students in the chemistry lesson could be increased especially, and for the RPI category those are teachers answer the scientific question and present presence of good communication patterns between teachers and students.

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