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UNIVERSITY OF MUHAMMADIYAH MALANG

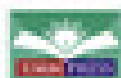


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*International Conference On Lesson Study
University of Muhammadiyah Malang*



Penerbit Universitas Muhammadiyah Malang

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International Conference on Lesson Study *University of Muhammadiyah Malang*

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Prosiding ini memuat sebagian besar *full paper* peserta dan telah dipresentasikan pada ICLS di Universitas Muhammadiyah Malang. Ruang lingkup makalah yang terhimpun cukup luas, meliputi aspek kebijakan *Lesson Study*, praktek *Lesson Study*, evaluasi pelaksanaan *Lesson Study* hingga perkembangan implementasi *Lesson Study* di berbagai sekolah.

Perkembangan *Lesson Study* di berbagai Negara mengarah pada madzhab *Lesson Study for Learning Community*. Kehadiran prof. Manabu Sato, tokoh penting *Lesson Study for Learning Community* pada ICLS di UMM ini membawa angin segar untuk perkembangan *Lesson Study* ke depan khususnya bagi para pegiat *Lesson Study* di Indonesia.

Tiada gading yang tak retak, demikian kata pepatah. Oleh karenanya, setiap kekurangan yang terjadi dalam pelaksanaan ICLS dan perwujudan prosiding ini, kami mohon maaf yang setulusnya. Teriring harapan para kontribusi dan peserta ICLS ke 7 di Universitas Muhammadiyah Malang.

Terimakasih

Ketua Panitia
Nurwidodo

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Dekan FKIP Universitas Muhammadiyah Malang

Alhamdulillah Panitia ICLS ke 7 Universitas Muhammadiyah Malang telah berhasil menyelenggarakan agenda tahunan ASLI dan sekaligus seminar Internasional di FKIP UMM. ICLS ke 7 di UMM ini istimewa karena dilengkapi dengan Colloquium Pendidikan yang merupakan agenda "ngunduh karya ilmiah doctor baru" yang sudah menjadi tradisi di FKIP UMM.

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Dekan FKIP

Dr. Poncojari Wahyono, M.Kes.

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IMPROVING SELF CONFIDENCE STUDENTS OF THE UNIVERSITY MUHAMMADIYAH OF GRESIK PGSD AT SUBJECTS TEACHING AND LEARNING THROUGH LESSON STUDY WITH COOPERATIVE LEARNING JIGSAW MODE

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Abstract : Departing from the problems in the classroom on the course Teaching and Learning, Lesson Study team PGSD agreed to bring problems to be solved with the Lesson Study. Lesson study conducted in stages, plan-do-see. At this stage of plan, lecturers jointly plan the preparation of lectures that became the focus of the learning problem solving based on previous observations. At this stage do, lecturers models implement the plan preparation courses that have been agreed upon, whereas at this stage of see, lecturer secara jointly evaluate the results of the implementation of learning and will make improvements to plan and do the next stage. Methods used is to implement cooperative learning methods Jigsaw. Jigsaw elections have been due to stage a relatively simple and focused exploration of confidence that it is possible to be appointed. Jigsaw is divided into four stages, namely: 1) grouping (group home); 2) giving the task of each member of the group (different tasks); 3) members of different teams with the same assignment to form a new group (group of experts), the team is back on the group discussion and origin; 4) The expert group (from the discussion) presented to the original group on tasks already mastered. At the time before implementation of Lesson Study, grade A student confidence PGSD based on the observation, is lacking. There is only one student out of 28 were deemed to have confidence. However, the implementation of Lesson Study on stage do the first one, has begun to emerge 9, and based on the observation of confidence on stage do the second and third respectively last 18 and 21 students were categorized confidence already visible. Based on the results of research and analysis, it can be concluded that the Lesson Study with Jigsaw cooperative learning methods can increase student confidence University of Muhammadiyah Gresik PGSD course on teaching and learning.

Keywords: Confidence, Lesson Study, Methods of cooperative learning Jigsaw.

1. INTRODUCTION

Improving the quality of learning should always be made to produce quality graduates. To achieve the success of learners in the learning required continuous hard work of various parties, especially educators. Educators are obliged to always improve the quality of the content or learning materials, as well as the learning process so that learners achieve maximum results. In addition, lecturers should also be able to evaluate learning and correctly. Departing from this understanding, PGSD Universitas Muhammadiyah Gresik Markowitz Lesson Study Prodi team. This team will focus on the implementation of lesson study as a follow-up to the seriousness of lesson study grant.

Learning and Learner is one of the compulsory subjects in the curriculum imposed PGSD Studies Program since the academic year 2014/2015. As for the substance of this course study focused on how prospective teachers or students PGSD equipped with theories of learning and teaching strategies, including models, approaches, strategies in the learning process to be performed later.

Departing from the initial observation, it was found there are some things that are the focus of lesson study PGSD, including student confidence. A student self-confidence is very important. Moreover PGSD students that in fact as prospective elementary teachers. As a prospective teacher, confidence will certainly affect the appearance of teaching moment later. According Angelis (2003: 10) Confidence is to have confidence in the abilities possessed, belief in a purpose or goal in life and believe that with ingenuity can do what you want, planned and expected. Further Centi (2003: 9) states that the self-confidence (self-confidence) is a feeling or attitude does not need to compare yourself with others, because it has been felt quite safe and know what is needed in this life. Based on observations made confidence Students Grades A-2014 feels very lacking. Activeness in learning has not appeared on the student.

Referring to problems in the classroom on the course Teaching and Learning, Lesson Study team PGSD agreed to raise the issue of confidence to be resolved by way of Lesson Study. Lesson Study have

been selected for one model of learning that has been assessed affect the learning process and results in the Faculty of Education, University of Muhammadiyah Gresik. Lesson Study Merging with the type cooperative Jigsaw is apt to increase student confidence. With the cooperative model Jigsaw, students will be trained to make the learning process independently with the original group systems and expert groups. This study aims to increase student confidence University of Muhammadiyah Gresik PGSD course on Teaching and Learning through cooperative learning lesson study with Jigsaw.

2. RESEARCH METHODS

The research was carried on in the form of a series of activities that lesson study consisted of three phases: planning, action, and reflection. The research design uses Lesson Study. Lesson study conducted in stages, plan-do-see. At this stage of plan, lecturers jointly plan the preparation of lectures that became the focus of the learning problem solving based on previous observations. At this stage do, lecturers models implement the plan preparation courses that have been agreed upon, whereas at this stage of see, lecturers jointly evaluate the results of the implementation of learning and will make improvements to plan and do the next stage. The research was conducted on students PGSD Class A-2014, with 28 students.

3. RESULTS AND DISCUSSION

The results of this study are translated as follows:

Stage Plan

This stage aims to design learning that can teach students to actively participate in learning activities that take place. From the result of problem identification and solution planning discussions, then compiled and packaged as a learning device comprising: Semester Lesson Plan (RPS), Sheet Student Discussion, assessment instruments and learning process, learning observation sheet. This preparation ahead of time direncanakan so that implementation can proceed smoothly. This is confirmed by the opinion Soegino (2013), that education must make preparations to teach and better if made jointly with the team. Of lesson study is a first step to facilitate a lecturer in learning planning.

Lecturer consisting of four people in a team, perform preliminary observations of the problems that occur classroom learning. From these results then used as a reference for the preparation of the learning plan. Determination of the model bergatian professors, the determination of the materials, and models will be taught dilaksanakan at this stage.

Phase Do

At this stage, the lecturer teaching models make preparations that have been agreed. Lecturer models appear to present a sub-topic material; Observer (lecturer) make the observation of learning activities; Observer (lecturer) record all processes that occur in learning activities; Held a discussion on the implementation of the action taken and noted weaknesses, a discrepancy between the scenario and implementation; Noting the student's response to learning; Record (record) of events during the learning process. At first do the material presented by lecturers models Ismail Marzuki is a variety of approaches to learning held on March 28, 2016. In the second Do, professor Afakhrul models Masub Bakhtiar expressed constructivism learning theory held on April 25, 2016. In the third Do, Subayani Wahyuning lecturer Nataria models with learning strategies matter. Do all three held on May 13, 2016 In the fourth do stairs, Setya Arya Nugroho as a lecturer model, by material learning strategies. As the focus of lesson study is confidence, covering aspects 1) conviction; 2) optimistic; 3) objective; 4) is responsible; 5) rational and realistic. Based on observations on Do 1-4, student confidence increased. At the time before implementation of Lesson Study, grade A student confidence PGSD based on the observation, is lacking. There is only one student out of 28 were deemed to have confidence. However, the implementation of Lesson Study on stage do the first one, has begun to emerge 9, and based on the observation of confidence on stage do the second and third respectively last 18 and 21 students were categorized confidence already visible. Of course this implies conformity with the opinion of Elvinawati (2012) which states that the lesson study gave a positive impact on learning. Likewise, according to Sumardi (2015), lesson study at the Institute Teachers and Education Personnel can improve the quality of learning.

See stage

After learning practices completed reflection. In this reflection was held discussion with the team of lecturers on the results of action learning, formulate and identify problems in the implementation and results of the observation activity student confidence. In the resulting unity do reflection to improve the management of time and materials, as well as the increased focus on student confidence. To boost confidence, the students emphasized the cooperative model jigsaw. Dipahamkan Students with learning

steps Jigsaw. Reinforce pembelajaran Jigsaw refers to the opinion of Julianto (2011), Jigsaw cooperative learning can increase the confidence of learners. While on the second do, obtained reflection materials should be maximum utilization of time. While in the third and fourth do, lesson study already visible optimally implemented. Increased lesson study is not merely perfection lecturers models, but the effect factor lesson study conducted by a team of lecturers made great contributions. In general, a reflection lesson study can walk to the plan and can increase the confidence of students in the subject of Teaching and Learning in the class A-2014.

4. CONCLUSION

- a. An increase in student confidence PGSD Universitas Muhammadiyah Gresik, on learning the course Teaching and Learning after the lesson study conducted by the cooperative model Jigsaw.
- b. Lesson study with Jigsaw cooperative model that is carried out by a team of professors, is very helpful in improving the quality of learning, especially in increasing student confidence PGSD Universitas Muhammadiyah Gresik.

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IMPROVING LEARNING QUALITY THROUGH IMPLEMENTING THE CONCEPT BY IBN ABDIL BARR

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Abstract : The weak quality of learning in Islamic education has resulted in the low quality of graduates. Furthermore, most Islamic education experts agreed to say that the Islamic education given to public school has failed in its purpose. It is due to the learning process itself which does not include the heart, or the inaccuracy of learning method applied. Therefore, to improve Islamic education and character education quality, the researcher sought the importance to adopt the learning concept stated by Al-Hafizh Abu Umar Ibn Abd al-Barr in Islamic education. Hence the research question lingers around how is the concept of learning by Ibn Abd al-Barr defined? Why the concept should be chosen as alternative to improve learning quality? This article is aimed to describe the concept by Ibn Abdil Barr to offer the improvement on Islamic education quality in Indonesia. Qualitative method through literature review and descriptive document analysis is used in this research. Research findings show that the learning concept suggested by Ibn Abd al-Barr consists of 14 methods and learning techniques apply to both individuals and groups. In addition to that are 8 teaching methods and techniques. Learning concept by Ibn Abdil Barr is highly relevant as an alternative to improve learning quality as it has been tested during the golden age of Andalusian kingdom once and it was maintained until today yielding abundant experts in Islamic education.

Keywords: Learning, Education, Islamic Education, Characrer, Abdil Barr

1. INTRODUCTION

Various means have been applied to improve the learning quality within Indonesian education system, particularly in the field of Islamic education. Different kinds of learning method have gone through trials and errors. However an experiment has never been done on learning method suggested by Hadith Experts, though it has been proved along the time yielding great *ulama* and Islam intellectuals. A great amount of learning methods referred to western science or intellectuals of the recent times, while in fact the knowledge has existed since the early ages and within Islamic countries.

Therefore we would like to offer one learning method from a Hadith Expert who participated in improving Islamic Education quality in Indonesia, namely the learning method of Abu Umar Ibnu Abd Barr al-Andalusi (368-463 H). Based on the background, the research question proposed are as followings: How is the learning concept by Ibnu Abdil Barr? And how it can be the alternative in improving learning quality?

These questions are importance since according the Law No.20 Year 2003 and regarding National Education System Section 1 Article 20, it is mentioned that learning is a process of interaction between students and teachers and learning resources occurring in a learning environment.” The interaction process between students and teacher here consists of learning method and teaching method. Carefully examining the book by Ibn Abd al-Barr entitled Jami’ Bayan al-Ilm wa Fadhlih, he explained learning method and teaching method as two essential variables to improve learning quality.

Ibn Abd al-Barr wrote in detail—although not systematically—the materials regarding learning methods and techniques. He classified two different learning methods which are individual learning method and group learning method. Therefore, the aims of this article is to describe the learning concept by Ibn Abdil Barr as an alternative to improving Islamic education learning quality in Indonesia.

2. RESEARCH METHODOLOGY

In order to answer the research questions of this paper, qualitative method is used in this research through literature review and descriptive document analysis. As mentioned above, intensive study on book of Ibn Abd al-Barr entitled *Jami' Bayan al-Ilm wa Fadhliah* has been done. The finding of conceptual notions of Ibn Abd al Barr have been used to analyse various prominent and substantial issues on Indonesian education.

3. FINDING AND DISCUSSION

Based on this research process, it was found the at least there are there important point which Ibn Abd al Barr discussed in his book in order to improve the quality of learning process either regarding the methods of study and teaching. Regarding the methods of study, he divided in two groups, individual and group learning methods. Moreover, those finding can be explained as following:

Individual Learning Method

In his book, Ibn Abd al Barr explained that there are several effective ways to optimize individual learning methods are as follows:

First, repeating and memorizing. This method applies to *Ushul* materials such as Al-Qur'an and hadiths, it is essential for those expecting to be *ulama* and for the illiterates. Abu Umar Ibn Abd al-Barr pointed out that memorizing *ushul* (basics of knowledge) is the key of knowledge itself, since one's knowledge refers to what he masters not what is contained in his book. Ibn Abd al-Barr stated that: "Considered as part of the *ulama*, when they aren't, are those who answer "Oh, it is written in my book in my bookcase."

Abu Umar then said in the prelude of his long text:

يَا مَنْ يَرَى الْعِلْمَ جَمَعَ الْمَالَ وَالْكَتَابَ خُدَعْتَ وَاللَّهِ لَيْسَ الْجِدُّ كَالْعَيْبِ
الْعِلْمُ وَيُحْكَمَ مَا فِي الصَّدْرِ جَمَعُهُ حِفْظًا وَقَهْمًا وَأَثْقَانًا فَذَلِكَ أَبِي
لَا مَا تَوَهَّمَهُ الْعَبْدِيُّ مِنْ سَفَاهِهِ إِذَا قَالَ مَا تَبْتَغِي عِنْدِي وَفِي كُتُبِي

"Oh, you who think of knowledge as stacking wealth and collecting books, you were fooled, In Allah's Name, sincerity is never equal to frolic around", "and True knowledge is what you would collect within your chest, with memorizing, understanding and mastery. This is my resource. Unlike what is said by the foolish men, when they argue "What you're looking for is contained in my books."

Second, writing and taking notes. Memorizing is the main method used by Arabians during Prophet's era. They tend to have strong memory but only few know how to write. Ibn Abd al-Barr stated that Arabians are famous for their strong memory, of whom some of them even had to select which matters to listen to, as once they hear something, it will stay in their memory. Ibn Syihab al-Zuhri (w.124) said: "For the sake of Allah, nothing comes to my ear that will slip from my memory," similar to that of Ibn Abbas r.a." Therefore, for those with weaker memory, Rasulullah PBUH suggests them to write, according to his saying:

((قيد العلم بالكتاب)) "Bind the knowledge within your writing."

Ibn Abd al-Barr then argued: "Today nobody memorizes as those people before (Ibn Syihab, et.al), had there weren't books to record everything, most knowledge must have been lost...". In writing and taking notes, one should take into account of these things: a) Writing should be based on the experts. b) Writing should be done right at the time when one listens or thinks of any thought on any kinds of media available, then it can be moved to a book. c) Applying selection method, which means writing only the right and correct materials. d) Categorization, to divide the *shahih* and *dha'if* in separated books.

Yet, to obtain expected results in memorizing and writing, he also suggested to seek guidance from experts. Memories and notes taken should be submitted to a teacher to seek guidance and correction for mistakes. Ibn Abd al-Barr said: "Those who write but not seeking for correction from *ulama* equals to

those who take leave to the rest room but come out without cleaning up". He also explained further related to instruction on correcting grammatical errors, errors within hadiths, examining the pronunciation and the interpretation.

Motivation is also necessary for students read more and muthala'ah. Last chapter of Ibn Abd al-Barr's is entitled "The advantage of reading books and advices to observe note books". Then he quoted Imam al-Bukhari to answer how to prevent forgetfulness. Imam al-Bukhari suggested: "Always read books."

Yet in the process when much is forgotten, then one should think more and ask to the experts. Ibn Abd al-Barr wrote the Chapter Compliments towards questions, highly motivated in seeking knowledge, and exhortation towards obstacles to knowledge. Citing Abd Allah Ibn Mas'ud r.a. "Knowledge increased in regards to research, obtaining knowledge is due to questioning, therefore learn what you don't know about and portray what you've learned in your deeds." In addition to that, quoting from Daghfal When he was asked: "How did you manage to memorize all this?", he answered: "Mind to keep thinking and mouth to keep asking."

Besides, education will benefited more to the application of Mulazamah method (Islamic Boarding School). Mulazamah means living with an alim to absorb his good deeds and knowledge within a long period of time. In Bahasa Indonesia it's called "nyantri".

This method was once introduced by Abu Hurairah r.a when he practiced mulazamah to the Prophet PBUH. Ibn Abd al-Barr commented on Abu Hurairah's hadith No. 593: This hadith contains many directions such as: (1) Hadith from Rasulullah of which the law is as binding as Al-Qur'an, (2) to portray knowledge, to spread and to teach it, (3) Mulazamah to ulama and the willingness to live modestly to obtain knowledge. In addition to that, Ibn Abd al-Barr wrote a chapter on Luqman al-Hakim's story and his will to his son to approach ulama and be serious in seeking knowledge.

Besides, getting more teachers is essential in learning process. He quoted Ayyub al-Sukhtiyani (w.131): "Indeed, you would never find any of your teacher's lacking until you sit close to other teacher. Then he also cited Mathar al-Warraaq (w.129): "A person who has only one teacher be like one with a wife, when she is in period, he will just sit powerlessly". Yet to seek for more teachers, according to Ibn Abd al-Barr, one should be willing to sacrifice in living modestly and travel a long journey."

Nevertheless, the whole learning process aforementioned should be gone through gradual process or *Tadriji*(gradually). Knowledge should be obtained through different stages of sciences and education, starting from *ushul* (the core of knowledge) and concluded with *furu'* (the branches of knowledge). He also explained that knowledge itself is widely defined so that one who learns should consider specialization. After mastering basic knowledge, a learner should consider to focus on one discipline as his expertise, since one's value is measured by his expertise. Indubitably, any discipline one wishes to take should be the most beneficial for himself and the *ummat*.

Furthermore he explained the importance of Wetonan (Bandongan) Method and coming inside very early. Ibn Abd al-Barr wrote: "It is said to Bazar Jamihru: "How did you manage to get this abundant knowledge?" he answered:

بَبْكَوْر كَبْكَوْر الْغُرَابِ وَصَبْر كَصَبْر الْحِمَارِ وَحِرْص كَحِرْص الْخَنْزِيرِ

"By coming very early like a sparrow, with the patience like that of himar and the ambition like that of pig."

Hence, when being faced to boredom, a learner should find refreshment. Ibn Abd al-Barr and the ulamas acknowledge that human's hearing might experience boredom, an human's soul is reluctant to saturation, heart can be attacked by laziness and mind might be obstructed by fatigue. When a learner senses this, it is suggested for him to seek for halal refreshment and entertainment like stories and tales, poems and poetries with wisdom, or just to have a rest.

Group Learning Method

Besides learning individually, learners can choose to study in group. In this case, Ibn Abd al-Barr explained that there are various methods to use, such as:

First, mudzakah method (Mudrasah, Muraja'a), which mean answer and question method among learners. He narrated from Ali, who told Abd Allah Ibn Buraidh:

تَزَاوَرُوا وَتَذَاكَرُوا هَذَا الْحَدِيثَ فَإِنَّكُمْ إِن لَّمْ تَفْعَلُوا يَدْرُسْ عِلْمُكُمْ

“Visit each other among you and practice mudzakah with each other about this hadith, unless you wish for your knowledge to vanish”

Second, munazharah method (Mujadalah) or group discussion. This applies to all disciplines unless when it creates unsupportive *mira'* or *jidal* (debates), moreover when it relates to akidah and al-Qur'an. Ibn Abd al-Barr wrote a chapter about “Detested debates within discussion” in which he stated that: “All Prophet's hadiths here forbid debates on al-Qur'an”

Third, mutharahah method (class discussion), this method is practiced by teacher delivering a problem and give opportunities for learners to brainstorm and answer, after deliberating arguments the teacher will explain the correct answer. This method refers to when Rasulullah PBUH mentioned a question: “There was one tree of which its leaves would never fall, the tree is an example of a Muslim. Could you please tell me what tree is that?”, This Shahih Hadith is included by Ibn Abd al-Barr in a chapter entitled “Teacher to Launch Problem Question to Learners.”

Teaching Method

Along with explaining learning method for the sake of learners, Ibn Abd al-Barr also explained that education highly depends on the method used by teacher. When a teacher masters education both theoretically and practically, it is undeniable that the students will grow to be great ulama. Referring to his knowledge and experience, Ibn Abd al-Barr outlined the methods and techniques of teaching, such as:

First, setting correct and appropriate goals based on each capacity. Ibn Abd al-Barr made an analogy of a doctor whose duty is to treat different patients suffering different kinds of illness. He cited Abu Farwah who said that Prophet Isa a.s once said: “Don't you ever obstruct knowledge from its expert of which you're a sinner, and don't you ever hand anything to those who are not experts in it from which you'll be fooled. Be a gentle doctor who would prescribe a medicine knowing that the medicine will help.”

Ikrimah (w. 107) said: “Indeed knowledge contains values”. Then he was asked? “What values?” He answered: “You have to hand it to those who can keep it and not wasting it.” When it is handed to the wrong person, it is similar to draping gold and jewelries on pig's neck. This definition was taken by Ibn Abd al-Barr from Prophet Isa a.s., Prophet Muhammad PBUH and al-A'masy.

Second, beginning the lesson with interesting materials to attract and to motivate learners as well as warming their readiness to accept lesson. In the chapter “Teacher Should Start the Lesson with Attractive Materials and Motivate Students”. Rasulullah PBUH mostly applied this method to teach his companions.

Third, simplifying materials, avoid complicating the lesson, and be patient. In the chapter regarding the courtesy of *alim* and *santri* (student), Ibn Abd al-Barr quoted a hadith narrated by Ibn Abbas, Muhammad PBUH said: “Teach and simplify it, don't you ever complicate things -3 times.” A teacher should then be patient and not emotional. Rasulullah PBUH said “teach and don't you scold them, since teacher is much better than a scolder.”

Fourth, a teacher should use clear language and repetition when necessary to make the lesson understandable. Ibn Abd al-Barr said: “the duty of a teacher when the lesson is not understandable is to repeat it in times.” Some ulama even suggested repetition more than three times, based on Muhammad PBUH when he said things, he repeated three times. It is meant to deliver the message both for learners who are close or far. Repetition is obligatory when materials are not understandable enough. Nevertheless, when the materials are well understood then repetition is not necessary.

Fifth, understanding the soul, traits, and potential of each students. This is important to influence students, particularly when a teacher wishes to build a character. In the chapter “The Courtesy of Alim and Santri”, Ibn Abd al-Barr quoted al-Khalil Ibn Ahmad (w. 167/170): “When you face a person making mistakes, and you know that he will certainly reject your suggestion, don't you reprimand him at the

moment, because with that you'll be in a hurry to deliver a knowledge and to obtain his hatred." Teacher should also grant special attention to those who are smart (*nujaba'*) as what have done by the preceding ulama.

Lastly, dictation toward students. Dictating knowledge mostly done by ulama, which is now developed in the form of hard copy materials distribution to students. Ibn Abd al-Barr mentioned various examples, such as: "Hasan Bashri (w. 110) dictated his interpretation to his students. Then Abd al-Rahman Ibn Mahdi (w. 198) told a story about Zaidah (al-Hafizh al-Kuhfi died 161) who came out to meet his students and said : "write this before I forget it." Later on, Imam Syafi'i (d. 204) also did imla' to his students in a Masjid hall till the sun shines on them.

Analysis / Discussion

Ahmad Tafsir claimed that the problem occurred in Indonesian Islamic education, especially in of public school, is still overwhelming. One of many challenges is the education method. Islamic education, especially in public school, could almost be said as a failure. It is due to the fact that teachers only conduct Islamic education from psychomotor and cognitive aspect; affective aspect (piety and faith) is lacking of attention. While on the contrary, the core of religion is the faith itself.

In his other book, Ahmad Tafsir emphasized: "What we found is the education which only emphasizes on physical and logical aspects. Spiritual aspect is not highly maintained. Therefore our graduates are still frail and easily influenced to conduct disgraceful deeds, and not constructive within the society." In other words, "students have knowledge about religion, but not how to be religious." The framework itself should be constructed in line with Islam.

Finally, some issues complained by education experts have been responded by the government through the design of character education integrated in 2013 Curriculum which has been revised in 2015. The Minister of Education and Culture, Mohammad Nuh, stated that "2013 Curriculum has been designed for the development of whole competence between knowledge, skill, and attitude." In addition, 2013 Curriculum has been built on scientific approach where the learning adopts the steps implemented by scientists in knowledge building through scientific method which is focused on the skills for knowledge search process instead of just knowledge transfer.

Therefore, referring to the above explanation, it can be highlighted that poor learning process and poor graduates' quality are caused by several factors, particularly:

1. Islamic Education is not managed seriously as it is not built upon the concept of Islamic knowledge itself, teaching time allocation for Islamic and Character education is considered low, and this subject is not a part of graduation requirement.
2. Teachers, educators, or lecturers, who teach religious materials or related to Islamic education, often follow liberalism, or the like, so that they teach tafseer (interpretation), hadith, or Islamic history using incorrect approach and method.
3. It seems that the scientific approach in Islamic Education is implemented in a forced manner, it is not appropriate with the comprehensive teaching of Islam, where it should include the approaches of talaqqi, imani, or tauhidi, or syar'i, as well as rational and empirical scientific approaches, like the Islamic concept stated by Ibn Abdil Barr.

We are of the opinion that this less appropriate methodology is the source of the problem. Therefore, the concept offered by Ibn Abdil Barr who lived in the golden age of Andalusia, namely 14 Learning Methods and Techniques as well as 8 teaching methods and techniques can be used as alternative solution to increase the learning quality nowadays. This concept is suitable to enhance today's learning process. For example, to memorize and to repeat the material that must be memorized is a very important thing to do until the end of time.

To write and to record by paying attention to 4 rules: To write something directly from the expert, to write something as soon as someone hears it or to write something immediately after it arises in someone's mind, and then transfer the writing to a book, to implement selection method, i.e. someone only writes good and correct material, and to implement categorization where the authentic materials are

compiled in one book, and the weak materials are compiled in another book. This method is relevant until today. Therefore, the materials recorded by the learners must be correct and qualified, they do not need to write all information or opinion, and they must not be confused between the correct and the incorrect materials.

After the students record the material, they must then submit their writing to their teacher in order to get guidance, correction, and direction. This method has been practiced until now in the writing of scientific papers and books where they must be edited by senior editor or professional reviewer.

The next methods are reading a lot and muthala'ah, thinking a lot, and asking directly to the expert, those methods are highly relevant and commonly practiced in the classroom.

The next method is Mulazamah or mentoring, this method is highly relevant in religious field and in other areas of expertise, including in the research field. Comparative study is a method commonly practiced by the researches nowadays.

Other method is *Tadriji* (step-by-step), from the *ushul* (basic and foundation) to its branches, and then select a particular field to master it, this method is also commonly practiced today.

The next methods are Sorogan and Wetonan methods, these methods are still widely practiced in Islamic boarding schools, while always coming early to an Islamic class must always be encouraged.

While group learning method like: Mudzakah (Mudrasah, Muraja'a), Munazharah (Mujadalah), and Mutharahah (class discussion) are still relevant to be implemented but must adhere the Islamic rulings.

If we those learning methods offered by Ibn Abd al-Barr are applied, we believe that the quality of the students will increase significantly.

Ibn Abd al-Barr also added other teaching methods as follows: To determine proper target according to their respective capacity, to start the learning with interesting things which will induce students' learning interest and encourage their preparedness to receive the lesson (there are 4 things that can be practiced: persuasive questions, encourage students to ask question, calling their names repeatedly, throwing a question or problem at them), to make the lesson easy for the students (by means of adequate explanation and media), to become patient by not easily angered toward the learners, to use words that are easily understood, to teach in a serious manner by avoiding joke, to understand the personality, character, and potential of every student, as well as to put optimal efforts in order to dictate knowledge to the learners, making the abovementioned methods and techniques are highly relevant.

If the learning process (studying and teaching) which involves 3 factors, namely Raw Inputs, Instruments (teacher, school management, curriculum, facilities, and infrastructures), and Environments, works properly then it is believed that successful education and quality graduates will be obtained. Finally, learning objective which is basically an effort to transform or to increase someone's potential, i.e. prospective student (raw input) turns into new personal (raw output) with certain quality, will be achieved.

Related to that, various learning and teaching methods proposed by Ibn Abdil Barr could be applied to improve current learning quality. It is suitable with the current learning condition. For instance, memorizing and repeating materials is always important regardless of time. When these learning methods were applied, we are certain that the quality of students will drastically improve.

4. CONCLUSION

After conducting research and discussion, we came to conclusion as follows: Firstly, learning concept suggested by Ibn Abd al-Barr consists of learning methods and techniques, both individual and group, as well as teaching methods and techniques. The last, learning Concept by Ibn Abd al-Barr is highly relevant to be alternative in improving learning quality, since it has been proven during the Andalusian golden age and it keeps on applied until now and it successfully yield the experts of Islamic education.

Looking up to the golden age of Islam in the past, the treasure of Islamic science and the richness of knowledge belonged to the ulama, hence I suggest to dig further on the core of knowledge

within Islam. Then, the knowledge should be actualized in today's Islamic education, when Islam suffered a setback of its age. This article is expected to be inspiration and valuable as it should be.

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IMPROVING THE QUALITY OF LEARNING THROUGH LESSON STUDY (CASE STUDY IN GEOGRAPHY ENVIRONMENT SUBJECT)

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Abstract: This article aims to illustrate the application of the lesson study in the Department of Geography Faculty of Social Sciences, Universitas Negeri Malang in Environmental Geography course. This research is a descriptive study of the learning. Data were collected through observation sheet and analysis of documentation as well as the work of students. The results of this study indicate that (1) Application of Lesson Study in the Department of Geography able to improve the quality of learning for every lecturer in the Department of Geography prepare models of learning more optimal because their collaboration in planning, implementation and observation as reflections within the framework of mutual learning. (2) Through the implementation of Education Studies, the tendency of students do not learn minimized (3) The Lesson Study is not the only way to improve the quality of teachers, but one of the main models of Coaching Educators should be applied and continued as a new culture, of course need to be adapted to the culture of Indonesia.

Keywords: Quality improvement, Lesson Study, Environmental Geography

1. PENDAHULUAN

Manusia pada hakekatnya adalah makhluk pembelajar, baik ketika masih bayi belajar merangkak dan berbicara sampai dewasa bahkan sampai usia lanjut sekalipun. Hal ini yang menjadi dasar pemikiran bahwa ketika manusia ada di dunia dan menjalani kehidupan secara sadar menjadi manusia pembelajar, manusia pembelajar yang dimaksud yaitu manusia yang menjalani kehidupan dengan proses perubahan perilaku di dalamnya. Perubahan perilaku tersebut membutuhkan ruang, waktu dan proses yang panjang. Ruang menjadi penting dalam pembelajaran karena di dunia terdiri dari lapisan (sphere) ruang yang tentu mempengaruhi kehidupan manusia. Benar ucapan geografer China Yi-Fu Tuan yang menyebutkan *people make place* (Domosh, 2010:5), manusia memang membentuk ruang, tempat, lokasi tetapi pada dasarnya ruang yang adalah suatu kesatuan wilayah permukaan bumi yang disebut geofora (Suhardjo, 2013:303).

Perguruan Tinggi pun menjadi ruang bagi manusia pembelajar, ketika seseorang memutuskan untuk menempuh jenjang pendidikan yang lebih tinggi maka ciri manusia pembelajar akan semakin identik karena manusia tersebut memilih perguruan tinggi sebagai ruang belajar keilmuan. Civitas Akademika merupakan komunitas pembelajar, salah satu ciri kegiatannya adalah ketika Perguruan Tinggi kerap dipakai sebagai ajang pengembangan ilmu juga penerapannya. Studi Pembelajaran (Lesson Study) yang diterapkan pada tahun 2013 di Fakultas Ilmu Sosial Universitas Negeri Malang merupakan bentuk penerapan juga pengembangan model pembinaan pendidik. Pendidik yang dimaksud adalah dosen, karena kualitas pembelajaran seorang dosen atau guru sangat strategis, berfungsi sebagai ujung tombak terjadinya perubahan (Munthe, 2009:1). Perubahan yang diharapkan terjadi kepada peserta didik harus dimulai dari pendidiknya terlebih dahulu. Jika diharapkan pengajaran berpusat pada proses belajar murid, tentu dosen dan didalamnya juga ada calon guru, harus paham teori belajar dan cakap mengenali gaya belajar yang cocok bagi murid (Pranoto I, 2014). Studi Pembelajaran dipilih menjadi satu dari banyak alternatif model pembinaan pendidik. "*Lesson study is a cycle in which teachers work together to consider their long-term goals for students, bring those goals to life in actual research lesson, and collaboratively observe, discuss, and refine the lesson*" (Lewis, 2002). Jadi studi pembelajaran merupakan siklus kegiatan dimana guru bekerjasama untuk mencapai tujuan jangka panjang keberhasilan peserta didik melalui penelitian pembelajaran secara kolaboratif.

Melalui studi pembelajaran, beberapa dosen di Jurusan Geografi bekerjasama (kolaborasi) melakukan pengkajian pembelajaran dalam perencanaan, melaksanakan pembelajaran (*open class*) dan

selanjutnya melakukan refleksi untuk mendapatkan umpan balik serta *lesson learned* dalam rangka meningkatkan pembelajaran pada siklus berikutnya. Kalimat kunci dalam studi pembelajaran adalah mengubah pembelajaran menjadi lebih efektif dengan jalan mengamati dan mengumpulkan data, kemudian melihat bagaimana pengaruhnya, dan selanjutnya merevisi rencana pembelajaran (Syamsuri I, 2008:28). Artikel ini mencoba untuk menguraikan hasil penerapan Studi Pembelajaran di Jurusan Geografi khususnya di matakuliah Geografi Lingkungan.

2. METODE

Penelitian ini merupakan penelitian deskriptif dengan menerapkan lesson study. Subjek yang dikaji dalam kegiatan perkuliahan adalah mahasiswa Pendidikan Geografi Angkatan 2012 Jurusan Geografi Universitas Negeri Malang. Kegiatan lesson study dilaksanakan melalui 4 (empat) Siklus yang setiap siklus meliputi tiga langkah kegiatan, yakni Perencanaan (plan), Pelaksanaan (do), dan Refleksi (see). Fokus Pertanyaan yang akan dijawab dalam penelitian ini adalah “Bagaimana” hasil penerapan studi pembelajaran terhadap kualitas perkuliahan. Data dikumpulkan melalui analisis dokumentasi, lembar observasi dan hasil kerja dari mahasiswa selama pelaksanaan kegiatan studi pembelajaran di Jurusan Geografi Fakultas Ilmu Sosial Universitas Negeri Malang.

3. HASIL DAN PEMBAHASAN

Pada awalnya dosen model mengidentifikasi permasalahan kelas yang akan dipakai dalam pelaksanaan studi pembelajaran, secara khusus dipilih kelas dari pendidikan geografi angkatan 2012. Dalam Perencanaan I (*Plan I*) bersama dosen-dosen lain, didiskusikan bahwa kelas tersebut mempunyai kecenderungan kurang kondusif mengikuti perkuliahan karena konsentrasi belajar dan ada beberapa mahasiswa yang suka mencuri kesempatan menggunakan gawai (*gadget*) di dalam kelas ketika pembelajaran. Terlebih untuk matakuliah Geografi Lingkungan yang jadwal perkuliahan dimulai jam 13.10 sampai jam 15.35 wib dan jarak kelas dengan jalan raya (jln veteran) yang berjarak 15 meter membuat lingkungan belajar yang kurang kondusif. Secara lengkap hasil penerapan studi pembelajaran pada matakuliah geografi lingkungan dapat dikemukakan sebagai berikut

1. Studi pembelajaran siklus pertama

Pelaksanaan Open Class I dilaksanakan dosen model, pada hari kamis tanggal 18 September 2014 pukul 13.10-15.35 bertempat di gedung SK1.05. Sedangkan observer pada pelaksanaan open class sebanyak 5 orang yaitu Hadi Soekamto. Dwiyono HU,. Sudarno Herlambang, Singgih Susilo, dan Mustofa.

Materi perkuliahan yang diajarkan pada open class I sebagaimana yang direncanakan (RPP) : (1) Ekologi Manusia,

Kegiatan awal yang kami laksanakan pada siklus I adalah dosen model menyampaikan materi pengantar/pembuka tentang materi yang akan dibahas, kemudian memberi 2 artikel yang berbeda yaitu membahas *Coadaptation of people and mosquitoes* (Artikel 1) *Social System Vs Ecosystem* (Artikel 2), dalam satu kelas terbagi menjadi 8 kelompok yang mana dalam satu kelompok terdapat 5-6 orang anggota yang heterogen. Sebelum berdiskusi pembagian kelompok, kelompok 1-4 berdiskusi tentang *Coadaptation of people and mosquitoes* (Artikel 1) sedangkan kelompok 5-8 berdiskusi tentang *Social System Vs Ecosystem* (Artikel 2) setelah dibagi kelompok kami berdiskusi dengan anggota kelompok selama kurang lebih 30 menit. Kemudian perwakilan kelompok (Kelompok 3) dari artikel tentang *Coadaptation of people and mosquitoes* (Artikel 1) mempresentasikan ke depan kemudian kelompok lain (kelompok 1,2, dan 4) yang sama-sama membahas artikel tersebut memberi sanggahan ataupun tambahan penjelasan/hasil diskusi dari kelompoknya masing-masing mengenai hasil yang sudah dipresentasikan tersebut, dan kelompok yang membahas artikel yang berbeda (kelompok 5,6,7 dan 8) di beri kesempatan untuk bertanya. Begitupun dengan kelompok yang membahas tentang *Social System Vs Ecosystem* (Artikel 2), setelah mempresentasikan hasil diskusi dari dua artikel tersebut dosen memberikan kesimpulan, evaluasi untuk pembelajaran yang sudah dilaksanakan, dan memberikan kesempatan kepada mahasiswa untuk bertanya. Kegiatan akhir sebagai penutup adalah dosen menyampaikan materi yang

akan dibahas untuk pertemuan selanjutnya yaitu Daya Dukung Lingkungan, dalam satu kelompok mahasiswa disarankan untuk menyiapkan data tentang jumlah penduduk, tingkat kebutuhan konsumsi setiap orangnya dan jumlah lahan pertanian dalam satuan provinsi.

Refleksi I

Refleksi langsung dilakukan setelah pembelajaran selesai. hasil refleksi dari open class I sebagai berikut

1. Mahasiswa belum terlihat sepenuhnya belajar (masih *teacher centered*)
2. Penggunaan artikel yang masih dalam bahasa asing membuat mahasiswa kesusahan dan perlu waktu untuk memahami artikel, bahkan ada mahasiswa yang terjebak untuk menerjemahkan bukan untuk memahami teks.
3. Ketika mahasiswa diberi waktu untuk bertanya, tidak ada yang bertanya
4. Beberapa mahasiswa terlihat menggunakan gawainya.

2. Studi Pembelajaran Siklus dua

Berdasarkan hasil refleksi pertama, maka direncanakan akan mengubah strategi pembelajaran sebelumnya dengan memaksimalkan gawai yang setiap mahasiswa punya sebagai media dalam pembelajaran.

Open Class II

Pelaksanaan Open Class II dilaksanakan dengan dosen model Ardyanto Tanjung, pada hari kamis tanggal 25 September 2014 pukul 13.10-15.35 bertempat dikedung SK1.05. Sedangkan observer pada pelaksanaan open class sebanyak 5 orang yaitu Hadi Soekamto, Sudarno Herlambang, Mustofa, Hendri Purwito, dan Purwanto. Materi perkuliahan yang diajarkan pada open class sebagaimana yang direncanakan (RPP) serta yang disampaikan dosen model pada pertemuan sebelumnya adalah Daya Dukung Lingkungan.

Kegiatan awal yang kami laksanakan pada siklus II adalah dosen model menyampaikan tujuan dari pembelajaran yang akan dipelajari. Kemudian dosen model meminta mahasiswa untuk duduk berkelompok dengan anggotanya masing-masing, kemudian mahasiswa diminta untuk berdiskusi mengenai konsep daya dukung lingkungan serta mencoba menuangkan konsep tersebut kedalam ilustrasi gambar dengan durasi waktu kurang lebih 30 menit. Setelah berdiskusi dan menggambar apa itu daya lingkungan, kemudian dosen model meminta satu orang mewakili kelompoknya untuk mempresentasikan hasil diskusi berupa gambar ke setiap kelompok searah jarum jam yaitu kelompok satu menjelaskan kepada kelompok dua, kelompok dua menjelaskan kepada kelompok tiga dan begitu seterusnya sampai 8 putaran tentang gambar tersebut dengan total durasi waktu 45 menit. Setelah selesai menjelaskan ke masing-masing kelompok, kemudian kami diminta untuk berdiskusi mengambil kesimpulan dari gambar tersebut tentang apa itu daya dukung lingkungan. Kemudian tiap-tiap perwakilan kelompok diminta untuk menuliskan pengertian dari Daya Dukung Lingkungan di papan tulis, Setelah semua selesai menulis di papan tulis perwakilan kelompok diminta untuk membaca pengertian dari Daya Dukung Lingkungan yang sudah ditulis tersebut. Setelah semua terbaca, dosen model memberikan materi tentang pengertian yang sudah terbaca tersebut dan materi tentang Daya Dukung Lingkungan, mulai dari pengertian, faktor-faktor, unsur-unsur daya dukung lingkungan, setelah dosen model menyampaikan materi tersebut mahasiswa diminta untuk menghitung tingkat kebutuhan konsumsi manusia setiap tahunnya dengan data yang sudah didapat serta menganalisis. Kemudian salah satu kelompok diminta untuk mempresentasikan hasil dari penghitungan serta analisis tersebut di depan kelas. Kegiatan akhir sebagai penutup dosen model memberikan evaluasi dari pembelajaran yang sudah dilakukan serta menyampaikan materi yang akan dibahas untuk pertemuan selanjutnya yaitu tentang kerusakan hutan.

Refleksi II

1. Observer mendapati ada beberapa mahasiswa yang bermain dengan gawai dan ada juga yang ngobrol dengan teman ketika pembelajaran berlangsung.

2. Sebagian mahasiswa sudah belajar, lebih aktif lagi ketika bertemu dikelompok dan dirolling lagi tapi belum ada plan
3. Learning cycle, eksplorasi, elaborasi dan konfirmasi
4. Pelajaran yang berharga, kepedulian dosen untuk menjaga suasana belajar yang kondusif penting agar mahasiswa memperoleh hasil yang sama.
5. Pengaturan tempat duduk melingkar, seharusnya ditata dulu kursinya supaya mudah diakses.

3. Studi Pembelajaran siklus tiga III

Pelaksanaan Open Class I dilaksanakan dengan dosen model Ardyanto Tanjung, M.Pd, pada hari kamis tanggal 2 Oktober 2014 pukul 13.10-15.35 bertempat di gedung SK1.05. Sedangkan observer pada pelaksanaan open class sebanyak 6 orang yaitu Hadi Soekamto, Sudarno Herlambang, Singgih Susilo, dan Mustofa.Drs. Hendri Purwito

Materi perkuliahan yang diajarkan pada open class sebagaimana yang direncanakan (RPP) serta yang disampaikan dosen model pada pertemuan sebelumnya adalah membahas tentang kerusakan lingkungan yaitu hutan.

Kegiatan awal yang kami laksanakan pada siklus III adalah dosen model menyampaikan tujuan serta langkah-langkah/prosedur dari pembelajaran yang akan dipelajari sebagai pembuka. Kemudian dosen model meminta mahasiswa untuk duduk berkelompok dengan anggotanya masing-masing, kemudian kami diminta untuk menyiapkan video yang sudah disiapkan sebelumnya yaitu video yang berjudul "Cari Hutan" di ponsel, yang mana pada Video tersebut terdapat 8 part, namun setiap kelompok hanya mengamati sesuai pembagian menurut urutan kelompok, misalnya kelompok satu mengamati part 1, kelompok dua mengamati video part 2 dst. Kemudian kami diminta untuk duduk berkelompok dengan anggotanya masing-masing dan mengamati video yang sudah kami siapkan di ponsel tersebut dengan durasi 10 menit dan mencatat point-point dalam video tersebut. Kemudian kami diminta untuk menjelaskan ke kelompok lain dengan perwakilan satu orang dalam setiap kelompok, dengan ketentuan menjelaskan serta memperlihatkan video di ponsel yang sudah diamati tersebut kepada kelompok lain searah jarum jam sampai delapan kali putaran, kelompok 1 ke 2, 2 ke 3, 3 ke 4, dan begitu seterusnya dengan durasi 60 menit dan tugas masing-masing kelompok adalah mencatat dari penjelasan kelompok lain. Setelah selesai menjelaskan kesemua masing-masing kelompok, perwakilan kelompok yang bertugas menjelaskan kesemua kelompok diminta berkumpul untuk diberi motivasi dari dosen, setelah itu kembali ke kelompok masing-masing dan menceritakan ke kelompok asal bagaimana tanggapan dan sanggahan dari kelompok lain. Kemudian kami diminta untuk membuat ringkasan dari presentasi dari semua masing-masing kelompok, mulai dari part 1 sampai part 8 dan dikumpulkan. Kegiatan terakhir adalah penutup, yang mana dosen memberi evaluasi serta menyampaikan materi apa yang akan dibahas untuk pertemuan selanjutnya yaitu tentang kerusakan laut dan pesisir, yang mana kami diminta untuk menyiapkan artikel dalam ruang lingkup pulau seperti kerusakan laut dan pesisir di pulau Jawa, Sulawesi, dsb.

Refleksi III

1. Masih ada tiga mahasiswa yang tidak belajar (no 1,8,5)
2. Penggunaan gawai seperti handphone dengan ukuran rekatif kecil akan mempengaruhi proses pengamatan di kelompok
3. Penggunaan HP harus disesuaikan dengan materi, gambar, video, tulisan
4. Kelayakan 2 alat bantu mengajar harus disesuaikan alat & materi
5. Mengamati video, menyimak, menangkap fakta dan data di video untuk kemudian di cerna dan analisis
6. Pelajaran yang bisa dipetik, pengecekan persiapan alat sangat penting bagi lancarnya proses pembelajaran catatan.
7. Satu HP 2 orang, sebelum membentuk kelompok harus diinventarisasi dulu, materi jangan terlalu banyak, disesuaikan (teknik A & B) bertemu atau ngundang, jaga gardu. pake karton tapi ada stand.presenter didatangi (beberannya).

4. STUDI PEMBELAJARAN SIKLUS IV

Pelaksanaan Open Class IV dilaksanakan dengan dosen model Ardyanto Tanjung, S.Pd., M.Pd, pada hari kamis tanggal 9 Oktober 2014 pukul 13.10-15.35 bertempat digedung SK1.05. Sedangkan observer pada pelaksanaan open class sebanyak 3 orang yaitu Hadi Soekanto, Mustofa, dan Hendri Purwito.

Materi perkuliahan yang diajarkan pada open class sebagaimana yang direncanakan (RPP) serta yang disampaikan dosen model pada pertemuan sebelumnya adalah membahas tentang kerusakan lingkungan laut dan pesisir, yang mana pada pertemuan sebelumnya mahasiswa diminta untuk mencari artikel dari sumber jurnal, hasil penelitian tentang kerusakan laut dan pesisir di tiap pulau yaitu pulau Sulawesi, Kalimantan

Kegiatan awal yang dilaksanakan pada LS IV adalah Ardyanto Tanjung menyampaikan tujuan serta langkah-langkah/prosedur dari pembelajaran yang akan dipelajari sebagai pembuka. Kemudian dosen model meminta mahasiswa untuk duduk berkelompok dengan anggotanya masing-masing, kemudian kami diminta untuk membaca artikel yang sudah kami siapkan yaitu artikel tentang kerusakan pesisir dan laut per pulau besar, yaitu Sulawesi, Jawa, Kalimantan, Bali, Papua, Maluku, Sumatra, dan NTT. Kemudian mengidentifikasi penyebab dari kerusakan yang terjadi dari artikel yang sudah dibaca kemudian kami diminta untuk membuat poster yang berkaitan dengan artikel yang sudah didapat dengan mencantumkan sumber artikel dengan durasi 60 menit. Setelah selesai membuat poster, mahasiswa diminta untuk menempel karyanya di dinding, dan mahasiswa diminta untuk melihat, membaca serta memaknai poster satu persatu hasil karya dari kelompok lain. Kegiatan akhir adalah dosen model memberikan waktu kepada mahasiswa untuk mengambil dokumentasi/foto dari hasil karyanya beserta dengan anggota kelompoknya, kemudian menutup kegiatan dengan salam.

5. KESIMPULAN DAN SARAN

Berdasarkan hasil pengamatan dan hasil kerja mahasiswa dapat ditarik kesimpulan bahwa

1. Penerapan lesson study di Jurusan Geografi mampu meningkatkan kualitas pembelajaran karena setiap dosen model di Jurusan Geografi mempersiapkan pembelajaran lebih optimal dikarenakan adanya kolaborasi baik dalam perencanaan, pengamatan ketika pelaksanaan serta refleksi dalam secara mutual learning.
2. Melalui penerapan lesson study, kecenderungan siswa tidak belajar diperkecil
3. Lesson study bukan satu-satunya cara untuk meningkatkan kualitas pendidik, melainkan Salahsatu model Pembinaan Pendidik yang patut diterapkan Dan dilanjutkan, tentu perlu disesuaikan dengan konteks Indonesia.

Setiap pendidik hendaknya terus menjadi manusia pembelajar, ketika ada kesempatan untuk mempelajari hal baru dalam rangka meningkatkan kualitas pembelajarannya diharapkan berani mencoba. Lesson study menjadi salahsatu cara yang efektif teruji dalam meningkatkan pembelajaran.

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REFLEKSI DAN EVALUASI KEMAMPUAN MAHASISWA CALON GURU BIOLOGI MEMAHAMI MATERI FISIKA SMP

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Abstract: Penelitian ini merupakan bagian dari tahapan pengembangan model pembelajaran TWSS – *think working scaffolding share*. Sebuah penelitian disertasi untuk menghasilkan model pembelajaran yang dapat membantu meningkatkan kompetensi IPA bagi mahasiswa dari jurusan nonIPA. Penelitian ini merupakan *preliminary study* atau uji pendahuluan tahap 2 yang dilakukan pada 4 – 11 April 2016. Hambatan dalam penguasaan IPA SMP bagi mahasiswa biologi adalah sulit memahami materi fisika. Artikel ini akan menguraikan refleksi dan evaluasi tentang modul yang diberikan sebagai bantuan pembelajaran dan kemampuan calon guru biologi memahami materi fisika. Kemampuan diukur melalui pretes dan postes, selain data nilai kemampuan juga dilacak melalui data pendukung berupa hasil observasi kegiatan belajar dan angket mahasiswa. Metodenya menggunakan tahapan model TWSS dan 3 siklus *lesson study* yakni *plan, do, see*. Kegiatan belajar berlangsung dalam 3 kali pertemuan. Setiap pertemuan diakhiri dengan refleksi dan evaluasi. Hasil *preliminary study* adalah sebagai berikut: Rerata hasil pretes 61, sebanyak 7 atau 39% dari 18 mahasiswa lulus. Rerata hasil postes 80, sebanyak 15 atau 83% dari 18 mahasiswa lulus. Hasil ini jauh lebih baik daripada *preliminary* pertama yang dilaksanakan pada Desember 2014: Rerata pretes 33 dan rerata postes 52. Tidak ada satupun dari 16 mahasiswa yang lulus. Nilai tersebut sangat mengecewakan, hanya mendekati nilai lulus minimal di perguruan tinggi yakni C. Nilai C di Universitas Negeri Malang memiliki range = 55 – 59.

Keywords: Pemahaman materi fisika, mahasiswa nonIPA, kompetensi IPA

1. PENDAHULUAN

Terdapat sejumlah faktor yang mempengaruhi keberhasilan pelaksanaan kurikulum IPA terpadu salah satunya adalah kualitas guru. Guru yang memperoleh persiapan memadai sesuai dengan tugas yang diembannya. Persiapan tersebut diperoleh lewat pendidikan maupun pengalaman pengembangan profesional di mana guru memperoleh konten pengetahuan terkait dengan kurikulum yang diajarkan (Huntley, 1998; Knudson, 1973; Leung, 2006; Palmer, 1991; Southern Region Education Board, 1998 dalam Harrel, 2010:1).

Ausburg and De Barros (2011:4) mengutip pernyataan Jacobs (1989) dalam hal persiapan guru sebagai berikut: ketika berpikir tentang persiapan guru selain memperhatikan penguasaan konten pada sejumlah bidang studi, tidak kalah penting juga harus dipikirkan bagaimana mengintegrasikan satu bidang studi dengan bidang studi yang lain. Tampaknya ini adalah kecenderungan bagi pelatihan guru masa depan. Guru dilatih untuk memahami pengetahuan interdisipliner dan tidak diisolasi dalam disiplin ilmu tertentu. Persiapan program bagi guru yang mendorong pemikiran intradisipliner terbukti memiliki efek positif bagi guru yang lulus dari program tersebut.

Pengembangan kurikulum dan model pembelajaran yang sesuai agar guru dapat mempraktekkan pembelajaran secara terintegrasi masih menjadi tantangan di banyak perguruan tinggi di berbagai negara. Para pendidik di tingkat perguruan tinggi sepakat bahwa apa yang diperoleh calon guru di bangku pendidikan hal itulah yang dibawanya ke dalam kelas (Sarfo, 2013; Wilujeng, 2012; Schleigh *et al.*, 2011; Oludipe, 2011; Harell, 2010; Augsburg and De Barros; 2009). Model pembelajaran bagaimana yang

mampu meningkatkan penguasaan IPA terpadu, sehingga calon guru mahir dalam menyajikan materi tersebut kepada siswanya, terus dikembangkan dalam banyak riset (Agoro and Akinsola, 2013; Micah; Moore, Tamara J.; and Roehrig, Gillian H., 2012; Keebaugh *et al.*, 2009).

Penelitian ini merupakan bagian dari penelitian disertasi yang bertujuan untuk mengembangkan model pembelajaran TWSS – *think working scaffolding share*. Sebuah penelitian disertasi untuk menghasilkan model pembelajaran yang dapat membantu meningkatkan kompetensi IPA bagi mahasiswa dari jurusan nonIPA.

Model TWSS memiliki tahap *scaffolding*. *Scaffolding* merupakan dukungan berjenjang yang diberikan kepada mahasiswa calon guru dalam 2 bentuk: *Scaffolding as instructional strategy* yaitu dukungan berjenjang oleh dosen dalam bentuk modul, dan sikap-sikap dosen yang bertujuan membantu siswa mencapai tujuan pembelajaran. *Scaffolding* tersebut dapat berupa petunjuk, penguraian langkah-langkah pemecahan atau pemberian contoh dan menyorot segi kritis dari tugas agar dapat dipahami peserta didik. Dorongan maupun umpan balik yang jelas dapat juga dilakukan oleh dosen dalam situasi tertentu.

Bantuan yang diberikan dimaksudkan agar mahasiswa tersebut mampu mengerjakan tugas yang lebih tinggi dan lebih rumit jika dibandingkan kemampuan mahasiswa itu sendiri. Jika mahasiswa menunjukkan peningkatan kemampuan, dosen mengurangi bantuan secara bertahap dan memberikan kesempatan yang lebih besar kepada mahasiswa untuk menyelesaikan tugasnya secara mandiri.

Scaffolding as cognitive apprenticeship yaitu menyediakan *scaffolding* (dukungan berjenjang) dalam bentuk pendampingan tutor yang berasal dari bidang yang berbeda dari mahasiswa. Tutor membimbing mahasiswa menguasai konten materi di luar bidang spesialisnya. Mahasiswa difasilitasi dengan pendampingan tutor yang akan mengarahkan, memberi petunjuk dan menjelaskan hal-hal yang kurang dimengerti mahasiswa dengan bahasa yang komunikatif. *Cognitive apprenticeship* atau pemagangan kognitif dalam pembelajaran, terjadi pada saat ahli dan pemula berinteraksi dengan fokus menyelesaikan tugas. Interaksi sosial tersebut bertujuan untuk pengembangan keterampilan kognitif pemula melalui pengalaman belajar otentik.

Sebagaimana mana halnya bantuan dosen dan modul, jika mahasiswa menunjukkan peningkatan kemampuan, tutor mengurangi bantuan secara bertahap. Mahasiswa diberikan kesempatan yang lebih besar untuk menyelesaikan tugasnya secara mandiri.

Selain refleksi dan evaluasi tentang modul, artikel ini juga tentang menyoroti pemahaman fisika mahasiswa calon guru bidang biologi. Pemahaman fisika diduga menjadi hambatan bagi guru biologi dalam mengajar IPA. Hal ini didasarkan kepada hasil penelitian terhadap 46 guru IPA SMP di Pekanbaru Riau, diungkapkan oleh Yennita, dkk (2012:1-6). 37% guru IPA berasal Pendidikan Fisika dan 48% berasal dari Pendidikan Biologi. Mata pelajaran IPA (baik fisika maupun biologi) pada sebagian besar sekolah diajarkan oleh guru yang sama. Kualifikasi guru IPA di Pekanbaru kurang sesuai dengan tugas mengajarnya. Bekal pengetahuan guru untuk mengajar IPA masih belum memadai. Hal itu dirasakan terutama oleh guru berlatar belakang Pendidikan Biologi namun harus mengajar fisika.

Suwarno dan Hidayat (2012:41-45) melakukan penelitian deskriptif melalui angket, wawancara dan observasi terhadap guru IPA SMP seluruh kota Banda Aceh. Berdasarkan hasil pengolahan data ditemukan 9 kendala diantaranya kompetensi guru yang kurang memadai, sehingga guru mengalami kesukaran dalam mengaitkan konsep antar subdisiplin dalam IPA, IPA terpadu belum diterapkan di sekolah disebabkan latar belakang guru yang berbeda-beda. Guru sulit untuk beradaptasi dalam pengintegrasian bidang kajian IPA, karena guru berlatar belakang fisika tidak memiliki kemampuan yang memadai untuk mengajar kimia dan biologi, begitu juga sebaliknya. Pihak sekolah belum melaksanakan pembelajaran IPA terpadu, untuk memperkecil resiko kesalahan pengajaran pada siswa.

2. METODE PENELITIAN

Preliminary dilakukan pada mata kuliah Pengembangan Kurikulum IPA di Jurusan Biologi FMIPA UM pada 4 – 11 April 2016. Jumlah mahasiswa sebanyak 18 orang. Tutor s2 pendidikan fisika sebanyak 5 orang. Penelitian telah mengimplementasikan model TWSS.

Pretest dan postes dilakukan sebelum dan setelah selesai 3 kali pertemuan. Soal mengacu pada indikator, dimana pada postes dilakukan perubahan 6 soal dari 14 soal yang diujikan. Materi tes meliputi cahaya, hukum Snellius, pembentukan bayangan, cacat mata dan bagaimana lensa membantu cacat mata.

Berdasarkan hasil pretes dibentuk kelompok heterogen. Sebanyak 18 mahasiswa dibentuk menjadi 4 kelompok, masing-masing didampingi oleh tutor sebagai observer, pemandu diskusi kelompok dan akan membantu dalam menjelaskan materi fisika maupun koneksi antara fisika dan biologi.

A. Disain *Scaffolding as Instructional Strategy*

Sebuah disain bantuan dalam bentuk modul yang akan membantu mahasiswa setahap demi setahap mencapai tujuan pembelajaran. Panduan dalam modul berisi materi, contoh, tugas berorientasi model (*think*: tugas individu, *working* tugas bersama kelompok, *scaffolding*: tugas dibantu tutor, *share*: menyajikan hasil kerja kelompok). Selain itu modul sudah dilengkapi dengan evaluasi tugas. Hal ini dimaksudkan agar mahasiswa dapat mengukur kinerjanya sendiri, apakah mereka mampu mencapai target yang telah ditentukan.

B. Disain *Scaffolding as Cognitive Apprenticeship*

Tutor mendampingi kerja kelompok mulai tahap *working*, untuk menjelaskan tugas, memandu diskusi kelompok dan mengarahkan kelompok atau individu dalam menyelesaikan tugasnya.

Pendampingan dalam mengarahkan tugas tahap *working* berbeda dengan tahap *scaffolding* dimana kelompok dapat bertanya dan meminta bantuan dalam hal materi tugas atau materi pelajaran yang sulit dipahami oleh mahasiswa biologi, mengingat tutor adalah mahasiswa s2 pendidikan fisika.

C. Plan

Kegiatan pada tahap awal penelitian adalah melakukan *plan* untuk mengkonstruksi pemahaman bersama antara dosen dan tutor, bagaimana melaksanakan sintaks model TWSS dan peran tutor dalam mendampingi mahasiswa menyelesaikan tugas mandiri dan kelompok.

Plan untuk tiap pertemuan dilakukan untuk memperbaiki pembelajaran. Berdasarkan kendala-kendala yang muncul pada pertemuan pertama, direncanakan perbaikannya dan dilaksanakan pada pertemuan kedua. Berdasarkan kendala-kendala yang muncul pada pertemuan kedua, direncanakan perbaikannya dan dilaksanakan pada pertemuan ketiga.

Agar lebih akurat, tutor menyarankan mendokumentasikan kegiatan belajar mahasiswa dengan video. Hal ini dimaksudkan sebagai bukti valid, adanya hambatan yang terjadi dalam kegiatan pembelajaran oleh mahasiswa. Setiap kelompok didokumentasikan oleh tutor masing-masing.

D. Do

Tahap selanjutnya adalah melaksanakan sintaks model pembelajaran. Tahap *think* dimana mahasiswa akan menyelesaikan tugas secara mandiri. Tahap *working* dimana mahasiswa akan bekerja bersama kelompoknya. Setelah itu kegiatan dilanjutkan dengan tahap *scaffolding* dimana mahasiswa dibantu tutor dalam menyelesaikan tugas dan menjelaskan materi fisika yang tidak dipahaminya. Terakhir adalah tahap *share* dimana mahasiswa menyajikan tugas kelompok yang telah diselesaikan dengan bantuan tutor. *Scaffolding* juga diberikan dalam bentuk modul.

Tugas penting tutor adalah pada saat mereka menjelaskan materi fisika kepada mahasiswa biologi. Tutor dengan demikian dapat fokus mengobservasi kegiatan belajar mahasiswa pada tahap *think*. Mulai tahap ini sikap tanggung jawab mahasiswa sudah dinilai. Pada tahap *working* tutor mengerjakan 2 hal yakni mengarahkan kerja individu dan kelompok sekaligus sebagai observer.

Pada tahap *share* tutor menilai peran serta dan keaktifan individu dalam menyajikan hasil kerja kelompok. Penilaian ini juga dilakukan ketika mahasiswa bekerja pada tahap *working*. Mahasiswa akan dinilai peran sertanya dalam melakukan evaluasi tugasnya sendiri, berdiskusi untuk menyelesaikan tugas kelompok, mengambil keputusan, dan sikap individu dalam mendorong teman satu tim menyelesaikan tugasnya.

Mengingat aktivitas pembelajaran tiap fase model harus dinilai maka selain beban sebagai pemandu kerja kelompok, sebagai peran ahli dalam menjelaskan materi fisika, peran tutor yang tidak kalah penting adalah sebagai observer.

E. See

Dosen dan tutor bersama-sama melakukan refleksi dan evaluasi di akhir pembelajaran.

3. TEMUAN PENELITIAN DAN DISKUSI

Temuan penelitian akan diuraikan dalam bentuk refleksi setiap pertemuan, kemudian evaluasi pada bagian akhir dari refleksi. Pada saat evaluasi akan dilakukan *plan* untuk perbaikan pada pertemuan berikutnya.

A. Refleksi dan Evaluasi Pertemuan Pertama, Senin 4 April 2016

Pertemuan pertama jadwalnya adalah 150'. Dosen melakukan pretest 30' dan hasilnya digunakan untuk membentuk kelompok heterogen. Tes hanya berlangsung 20' untuk 14 soal pilihan ganda.

Tahap Pendahuluan 30'

Tahap pendahuluan seharusnya ada kegiatan memotivasi mahasiswa tentang model connected. Dosen melakukan tanya jawab tentang model connected, namun mahasiswa sama sekali tidak memahami apa yang dibahas, mereka sama sekali tidak mengenal dan tidak mengetahui topik maupun model yang akan mereka pelajari.

Pada tiga kali pertemuan mahasiswa akan belajar koneksi materi biologi dan fisika. Salah satu cara adalah melalui pemaduan model connected. Tugas pada modul dirancang mengaitkan biologi dan fisika.

Refleksi tiap pertemuan disajikan sebagai berikut:

a. Tahap Think 20'

Dosen memberikan kesempatan mahasiswa bekerja sendiri pada tahap *think*. Tahap ini membutuhkan waktu lebih lama untuk dikerjakan. Kendala pada tahap ini adalah meskipun sudah membaca apa yang harus dikerjakan namun, tetap membutuhkan penjelasan dan pendampingan tutor untuk mengarahkan pada yang harus dilakukan.

- 1) Butuh waktu lebih lama untuk bekerja mandiri. Alasan mahasiswa adalah belum bisa adaptasi dengan cara pembelajaran baru. Mahasiswa butuh adaptasi mengerjakan tugas dengan modul yang membahas materi yang sama sekali baru.
- 2) Rata-rata mahasiswa masih belum memahami apa yang harus dikerjakan. Tutor perlu mengkondisikan atau menjelaskan apa yang harus dikerjakan. Tutor perlu memberi peringatan agar tugas segera diselesaikan.
- 3) Semua berusaha untuk mengerjakan tugas mandiri, berupa 3 pertanyaan tentang pembentukan bayangan, bagaimana jatuhnya bayangan pada cacat mata dan soal bagaimana lensa membantu cacat mata. Namun mahasiswa merasa sulit mengerjakan materi yang cenderung ke arah fisika.
- 4) Kecepatan mengerjakan berbeda untuk setiap mahasiswa, sehingga ada kelompok yang melanjutkan tahap *think* pada tahap *working*.

b. Tahap Working 80'

Kendala pada tahap ini adalah masih melanjutkan kerja pada tahap *think*. Tahap ini memakan waktu cukup lama.

- 1) Sebanyak 71% mahasiswa menyatakan contoh pengembangan materi fisika dalam modul adalah sulit. Mahasiswa tidak mampu mengerjakan materi berupa soal dan rumus fisika dengan teman sesama biologi.
- 2) Ada kelompok yang menunggu semua tugas teman-temannya selesai, belum bisa mengerjakan yang lain. Tutor harus mengingatkan untuk mengerjakan yang lain, misalnya mulai membuat RPP. Mahasiswa beralasan masih bingung tentang instruksinya. Angket tentang ini (Bagaimanakah pendapat Anda terhadap komponen kegiatan pembelajaran berikut: LKM atau tugas yang tertata), menunjukkan hasil 53% tidak suka.
- 3) Kelompok yang selesai tugas mandiri, berusaha mengerjakan tugas *working* namun hanya berputar-putar pada membuat RPP dan materi biologi. Dalam tahap *working* mahasiswa terlalu banyak membahas materi biologi, kurang mampu mengaitkan dengan materi fisika. Hal ini disebabkan mahasiswa tidak boleh didampingi oleh asisten/tutor. Akibatnya waktu untuk memahami materi fisika sedikit, sehingga mahasiswa merasa kurang memperoleh pengetahuan. Angket tentang ini (bagaimanakah pendapat Anda terhadap komponen kegiatan pembelajaran berikut: suasana kelas dengan cara belajar yang baru), menunjukkan hasil 41% tidak suka.
- 4) Berdasarkan bukti rekaman video, waktu banyak terbuang karena mengulang-ulang tugas, padahal mahasiswa sudah merasa bosan karena tidak bisa. Tugas *think* dilanjut ke *working*, tugas *working* berputar-putar terlalu lama di materi biologi. Mahasiswa baru kemudian beranjak mengerjakan materi fisika pada tahap *scaffolding*.

Evaluasi pemahaman fisika: Mahasiswa hanya mengerjakan bagian biologi saja, pada saat tugas individual, yakni tentang jatuhnya bayangan pada cacat mata. Sebenarnya materi tentang pembentukan bayangan, cacat mata dan lensa sudah dipelajari dalam perkuliahan Materi IPA SMP 1 dan 2. Materi tentang mata juga sudah dipelajari dalam mata kuliah Anatomi dan Fisiologi Manusia.

Mahasiswa tidak ada satupun yang mengerjakan soal dengan rumus fisika tentang lensa. Bagaimana kekuatan lensa, jarak pandang pada cacat mata dan hal-hal yang berkaitan secara matematis dalam materi tersebut.

Evaluasi modul: *Scaffolding* dalam mengarahkan mahasiswa memahami tugasnya ternyata harus dimulai sejak awal, ketika tahap *think*. Belajar dengan modul adalah hal baru, sebuah cara yang selama ini belum pernah mereka alami dalam pembelajaran sebelumnya. Seharusnya modul bersifat *stand alone*, mahasiswa membaca instruksi mencermati contoh tugas yang harus dikerjakan dan membaca materi, namun kenyataannya tetap membutuhkan instruksi verbal. Asisten atau tutor sebaiknya mendampingi untuk menjelaskan apa yang harus dilakukan.

Plan untuk perbaikan pembelajaran pada pertemuan berikutnya: Menyediakan waktu di luar jam untuk membimbing mahasiswa memahami materi fisika dan membuat RPPnya. Pembimbingan juga dilakukan melalui media sosial *whats app* atau WA. Grup WA yang beranggotakan satu kelas dapat bertanya kepada tutor tentang hal-hal yang kurang dimengertinya atau sulit dikerjakan.

B. Refleksi dan Evaluasi Pertemuan 2, Selasa 5 April 2016

Pertemuan kedua terjadwal 100 menit. Pertemuan ini masih melanjutkan kerja pada tahap *working* 50' setelah itu dilanjutkan dengan tahap *scaffolding* 50'.

c. Tahap *Scaffolding*

Ini adalah tahap yang ditunggu-tunggu oleh mahasiswa. Fokus diskusi dengan tutor sesuai dengan harapan, tentang semua materi yang sulit. *Scaffolding* dilanjutkan di luar kelas sesuai *plan* yang dilakukan pada refleksi pertemuan sebelumnya.

Temuan ini serupa dengan *preliminary* pertama. Materi yang diujicobakan sama. Hasil pengamatan tutor *preliminary* pertama sebagai berikut:

- 1) Hanya kelompok 1 dan 2 yang berusaha bekerja individu, beberapa saat tampak aktif secara individual, aktif berdiskusi. Padahal belum masuk tahap *working*.

- 2) Kelompok 3 dan 4 langsung minta bantuan tutor, 3 pasif berdiskusi. Dalam tahap *think*, tutor juga langsung membantu mahasiswa mengerjakan tugas individual. Tidak menunggu tahap *scaffolding*.

Evaluasi pemahaman fisika: Mahasiswa ingin mengerjakan materi fisika namun belum mampu melakukan hal itu tanpa pendampingan tutor. Hal ini didukung dengan data hasil angket, respon mahasiswa 76% menyatakan terbantu oleh kehadiran tutor. Hasil angket secara deskriptif (mahasiswa menuliskan apa yang mereka inginkan dalam bentuk kalimat) sebagai berikut: Pada tahap *thinking* kami sebaiknya belajar konsep sendiri, setelah itu didampingi asisten untuk mengevaluasi konsep yang dipelajari sendiri. Begitu pula pada tahap *working* dan *scaffolding* tetap didampingi tutor setelah kita diberi kesempatan untuk berdiskusi dalam kelompok. Tutor dibutuhkan untuk mengarahkan mahasiswa agar mampu mencapai tujuan pembelajaran, disamping tugas penting menjelaskan materi fisika yang sulit dipahami. Peran tutor ternyata jauh lebih penting daripada yang diduga peneliti, hal ini dapat diamati selama jalannya uji coba. Mahasiswa sama sekali tidak berani mengeluh atau bertanya kepada dosen. Pada tahap pengembangan perangkat, banyak kendala yang dihadapi terutama menyangkut KD dan penyusunan indikator bidang fisika.

Evaluasi modul: Instruksi tugas pada modul kurang jelas. Angket tentang uraian kegiatan memperoleh respon 88% kurang jelas. Menurut tutor sebaiknya tujuan modul diturunkan menjadi petunjuk atau instruksi pengerjaan agar lebih mudah dipahami mahasiswa.

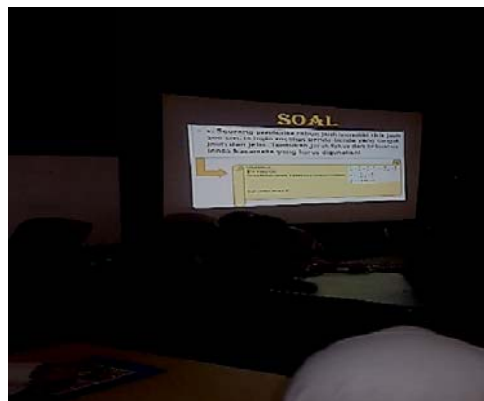
Plan untuk perbaikan pembelajaran pada pertemuan berikutnya: Menyediakan waktu di luar jam untuk membimbing mahasiswa memahami materi fisika dan membuar RPPnya. Pembimbingan juga dilakukan melalui media sosial *whats app* atau WA.

C. Refleksi dan Evaluasi Pertemuan Ketiga, Senin 11 April 2016

Pertemuan ketiga jadwalnya adalah 150'. Pertemuan ini diisi dengan tahap *share*, pengisian angket oleh mahasiswa diakhiri dengan postest 20'

d. Tahap Share

Tiap kelompok yang mempresentasikan tugasnya mampu menunjukkan penguasaan pengetahuan rumus matematis tentang bagaimana lensa membantu cacat mata. Lihat Gambar 1. Bahkan ada kelompok yang mendisain pembelajaran dengan inkuiri, mereka mampu mendeskripsikan cara belajar menggunakan set optik.



Gambar 1. Mahasiswa mampu menunjukkan penguasaan rumus matematis pada tahap *share*

Soal postes disusun berbeda dengan pretes. Postes memuat 6 soal baru, 2 soal diantaranya adalah perhitungan optik. Untuk postes, ada dua mahasiswa yang memperoleh nilai bulat 100. Sebagian besar mengalami peningkatan nilai, namun ada 2 orang mahasiswa yang nilainya tetap. Menurut tutor, mahasiswa tersebut tidak memperhatikan ketika diajari oleh tutor. Tutor memberi kesempatan semua mahasiswa untuk ikut dalam grup belajar di luar kelas, keduanya tidak aktif untuk belajar.

Rerata hasil pretes 61, sebanyak 7 atau 39% dari 18 mahasiswa lulus. Rerata hasil postes 80, sebanyak 15 atau 83% dari 18 mahasiswa lulus. Hasil ini jauh lebih baik daripada *preliminary* pertama yang dilaksanakan pada Desember 2014: Rerata pretes 33 dan rerata postes 52. Tidak ada satupun dari 16 mahasiswa yang lulus. Nilai tersebut sangat mengecewakan, hanya mendekati nilai lulus minimal di perguruan tinggi yakni C. Nilai C di Universitas Negeri Malang memiliki range = 55 – 59.

Evaluasi pemahaman fisika: *Scaffolding* berjalan cukup baik, hal ini ditunjukkan dengan kemampuan mempresentasikan hasil kerja kelompok. Semua kelompok menunjukkan penguasaan membuat RPP dengan materi yang berhubungan dengan fisika. Rerata nilai pengembangan perangkat 82. Jumlah mahasiswa yang mampu menjawab perhitungan pada soal optik juga sangat memuaskan. Soal pertama 11 orang menjawab benar. Soal kedua 9 dari 17 mahasiswa bisa mengerjakan dengan benar. Pada saat mahasiswa merancang RPP maupun mengerjakan tugas *think* dan *working*, mereka sama sekali tidak bisa mengerjakan soal dengan rumus dan perhitungan.

4. KESIMPULAN

- a. Instruksi tugas pada modul kurang jelas. Angket tentang uraian kegiatan memperoleh respon 88% kurang jelas. Menurut tutor sebaiknya tujuan modul diturunkan menjadi petunjuk atau instruksi pengerjaan agar lebih mudah dipahami mahasiswa.
- b. Sebanyak 71% mahasiswa menyatakan contoh pengembangan materi fisika dalam modul adalah sulit. Mahasiswa tidak mampu mengerjakan materi berupa soal dan rumus fisika dengan teman sesama biologi pada tahap *working*.
- c. Peran tutor ternyata jauh lebih penting daripada yang diduga peneliti, hal ini dapat diamati selama jalannya uji coba. Belajar dengan modul adalah hal baru bagi mahasiswa. Rata-rata mahasiswa masih belum memahami apa yang harus dikerjakan. Tutor perlu menjelaskan atau mengkondisikan apa yang harus dikerjakan. *Scaffolding as cognitive apprenticeship* yang direncanakan mulai tahap *working* sudah dilakukan sejak mulai *think*.
- d. Pada tahap *think* tidak ada satupun mahasiswa yang mengerjakan soal dengan rumus fisika tentang lensa. Bagaimana kekuatan lensa, jarak pandang pada cacat mata dan hal-hal yang berkaitan secara matematis dalam materi tersebut.
- e. Pada tahap *working* ada kelompok yang menunggu semua tugas teman-temannya selesai, belum bisa mengerjakan yang lain. Tutor harus mengingatkan untuk mengerjakan yang lain, misalnya mulai membuat RPP. Mahasiswa beralasan masih bingung tentang instruksinya. Hasil observasi ini menunjukkan bahwa peran tutor *as cognitive apprenticeship* yakni mendampingi mahasiswa untuk menjelaskan tugas, memandu diskusi kelompok dan mengarahkan kelompok atau individu dalam menyelesaikan tugasnya, tidak kalah pentingnya dengan peran ahli untuk menjelaskan materi yang sulit.
- f. Respon secara deskriptif oleh mahasiswa tentang peran tutor: Pada tahap *thinking* kami sebaiknya belajar konsep sendiri, setelah itu didampingi asisten untuk mengevaluasi konsep yang dipelajari sendiri. Begitu pula pada tahap *working* dan *scaffolding* tetap didampingi tutor setelah kita diberi kesempatan untuk berdiskusi dalam kelompok. Tutor dibutuhkan untuk mengarahkan mahasiswa agar mampu mencapai tujuan pembelajaran, disamping tugas penting menjelaskan materi fisika yang sulit dipahami.
- g. *Scaffolding* berjalan cukup baik, hal ini ditunjukkan dengan kemampuan mempresentasikan hasil kerja kelompok. Semua kelompok menunjukkan penguasaan membuat RPP dengan materi yang berhubungan dengan fisika. Rerata nilai pengembangan perangkat 82. Rerata hasil pretes 61, sebanyak 7 atau 39% dari 18 mahasiswa lulus. Rerata hasil postes 80, sebanyak 15 atau 83% dari 18 mahasiswa lulus. Untuk postes, ada dua mahasiswa yang memperoleh nilai bulat 100.

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**PROJECT BASED LEARNING TO TRAIN CREATIVITY STUDENTS
IN DESIGNING PRODUCTS ORGANIC AND INORGANIC WASTE
THROUGH LESSON STUDY (BIOLOGY COURSE)**

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Abstract: A Learning biology aims for provides a knowledge to understand the concepts of biology and also to provided supplies for students to be able use the scientific method grounded based on a scientific attitude to solve problems in reality, so the students more aware of the greatness and power of the creator. The Students in learning process is not enough just to master the theories acquired during in the course, but also willing and able to apply for a role-as well as solve problems encountered in daily life and social life. Therefore, we need a learning methods to facilitate, this is project-based learning. This learning centered on student learning and integrated with practice and real-world issues, have great potential to make a learning experience more interesting and meaningful for learners, and learners become active in their learning. The Learning using the issue as a first step in learning, finding and collecting data and information from multiple sources to solve problems and integrate the student's knowledge, make decisions on a wide range of alternative solutions to problems, and activity significantly to produce products with high creativity. The partisipan in this research is students in first semester school year 2025/2016 biology education program STKIP Hamzanwadi Selong (N = 24). A result of observations during in learning process, that is created design project make by students is impersonal and and some modified, in making of products needed another idea to apply design project has been created. The conclusion that the necessary guidance repeated in preparing the design project and making of organic and inorganic waste.

Key word: *project based learning, design project, organic and inorganic waste*

1. INTRODUCTION

To preparing qualified human resources its means empowering the whole person, which is the physical aspect and the way of thinking. The young generation of Indonesia need prepared to entering of free competition in era globalization. They should critically and awareness the importance of a importance of preserving the environmental functions for next generations in managing natural resources (Rustaman, 2000). The college as a place to prepare students become ingenious and qualified human, should be introduced about life skills. To introduction of life skills does not mean changing the curriculum developed or adjustments but reorienting existing curricula to reflect the values of real life. A learning oriented life skills giving new situation in learning, because after completion of the course students have life skills that can be used to solve problems life by using various facilities in their surrounding. By providing life skills to students, at least the students have the confidence to overcome the problems that happened in his life.

Education aims to educate the nation's children and squire them to understand their environment and manage it well. Thus, a concept given in learning process should be tune with the progress of science and technology. Therefore, the collage should be give provide a provisions in form of skills so that they can manage and utilize natural resources in the surrounding areas, one of them by applying learning strategies that can train a creative thinking of students through lectures. One of the strategies learning in education is project-based learning. Project-based learning is pedagogically structured, involves students in learning knowledge and skills through the process of finding or extracting (inquiry) using questions authentic, makes products ranging from planning, designing, make a product, and reflect on the creation of products so that the students experienced interesting learning and meaningful (Gaer, 1998; Doppelt, 2005; Higher Education 2008).

To be meaningful, the learning process used starting from challenging questions about the phenomenon, then assigns students to perform an activity, focusing on the collection and use of evidence, not just deliver information directly and emphasis on rote (Lawson, 1995; Ministry of National Education, 2002). Project-based learning allows students to broaden the knowledge of a particular subject. a knowledge gained more meaningful and learning activities become more interesting, because knowledge is beneficial for him to better appreciate the environment, to better understand and solve a problems encountered in real life. The ability to design projects is learning that supplying students to designing a project in Handling of Waste Organic and Inorganic content, through project-based learning that begins the real question and relevant to everyday life, students identify and find own a problems by making observations in the surrounding environment, making the project design after getting a solution of the chosen alternative solutions in project implementation.

One of the real phenomenon is easily observed by the students associated with environmental learning material is about environmental pollution caused by the waste both organic and inorganic, that is result of human activities. In this case, the need for handling and takes a creativity in reusing the waste so that it can produce a product that has economic value. Based on the description, the question of this research is whether to implement the project-based learning, students can design products from organic and inorganic waste?

2. RESEARCH METHODOLOGY

This research use descriptive statistics, that is describe or giving an overview toward of the object to be studied through a data sample or population as is, without analyzing and making conclusions apply to the public (Sugiyono, 2011). The participant involved 24 students in the first semester of biology education STKIP Hamzanwadi - Selong which follows the Biology course and divide into six group, each group consist of four student. The instrument in this research is worksheets activity, a worksheets activity done outside course (conditioned), with the intention to monitor the work of students, and guiding all groups to make a design. The following forms of worksheets activity that is used in learning.

Make a product from various types of waste

Direction

1. Read a information in this worksheet activity
2. Discussion and work with your group
3. Create a project design about your activity
4. Make a product suitable your design

A. Content

The organic and in organic waste

Generally, the waste is residue, effluent or sewage generated from everyday human activities, production activities, agriculture and factories. Waste is also an ingredient that is meaningless and worthless. Waste contained in the environment around us can be categorized into several types, all kinds of waste including is organic and inorganic waste. Organic waste is waste that easily decomposes through natural processes. Biodegradable organic waste because it is composed of organic materials. Organic waste derived from plants and animals. Examples of organic wastes are vegetables, trees, leaves, manure, and others. For the processing of organic waste, is relatively easier compared to inorganic waste handling. Organic waste can also be utilized, such as compost and biogas made. Inorganic waste is garbage that can not be treated in soil, an example of inorganic waste is plastic and bottles. However, inorganic waste can be recovered through the recycling process. Inorganic waste recycling can be done in several ways, namely is combustion, destruction, and was buried in the soil. Inorganic waste is burned is a way to reduce volume of waste. A disadvantage this method produces a residue combustion fume, which would result in air pollution. As for the manner of garbage destruction

cut into small pieces, and then recycled into new items. For example, plastics are recycled into plastic stuff new again. Garbage is handled in a manner buried in the ground, just a way of leveling the volume of waste.

B. TASK

1. Choose one kind of organic and inorganic waste that exists around you.
 2. The types of waste that you choose, in what way the waste can be processed into useful products for life (create three types of products).
 3. Based on your choice at number 2, create a design of recycling waste products. The contents of the draft include:
 - a. Title design
 - b. a problem
 - c. alternative solutions a problems
 - d. Tools and materials used
 - e. work steps making product (compiled systematically)
- Each group not be the same a title design in making the product.*

Tabel 1. The instrument for asesment design project

Aspek	Indicator	Score	Group					
			1	2	3	4	5	6
State a problem	The problem is not relevant	1						
	The problem is relevant but not original/generally	2						
	The problem is relevant, but fails to show the authenticity of a high/modification	3						
	The problem is relevant and show a high level of authenticity	4						
Alternative a solution	Mention a solution does not match with a problems and objectives	1						
	Mention the solution correctly but only combine existng ideas	2						
	Mention the solution correctly; showing modification of existing ideas	3						
	Mention the solution correctly; showing the products that areactually new (original and unexpected)	4						
Arrange a step of work	Explaining work stepsbut no systematic	1						
	Explaining work steps a systematic, but less clear	2						
	Explaining work steps a systematic, but less clear (do not use scientific language)	3						
	Explaining work steps a very systematic and clear	4						

3. FINDING AND DISCUSSION

Designing a Project; the process of designing done in the classroom with the intention to facilitate in guiding students to do the student worksheet. Result of observations during designing activities, students still do not understand systematically how to create a design as how to express the problem, submit an alternative solution, and how to write the workings (using a phrase that is not scientific). Having explained in more depth, the students already understand how to make the design project, but apart from that all students need guidance and consulting design project not one time. Base on results design project, is seen that students create a draft of a general and modification. Here are the results in the group design process waste (presented in chart 1).

The components in design modified from Doppelt and Starko (2005) namely (a) Problem: students identify problems and ask questions in project design, (b) Objective: students establish an objective based on state a problem, (c) Alternative solution: student conduct investigation by finding answers from variety resources to solve problem so getting a variety of alternative solutions, after that students considering various solutions obtained without influence of external factors, students choose a solution of state alternative solutions. By this strategy, creative ideas expected emerge that has not been previously disclosed, (d) Steps implementation/way of working: students constructing a plan of implementation in accordance with a solution chosen, from the content of draft can be seen whether students show creative ideas in making a design of product. Make a product; make a products based on results of design is conditioned as well, the groups make their products in the biology laboratory.

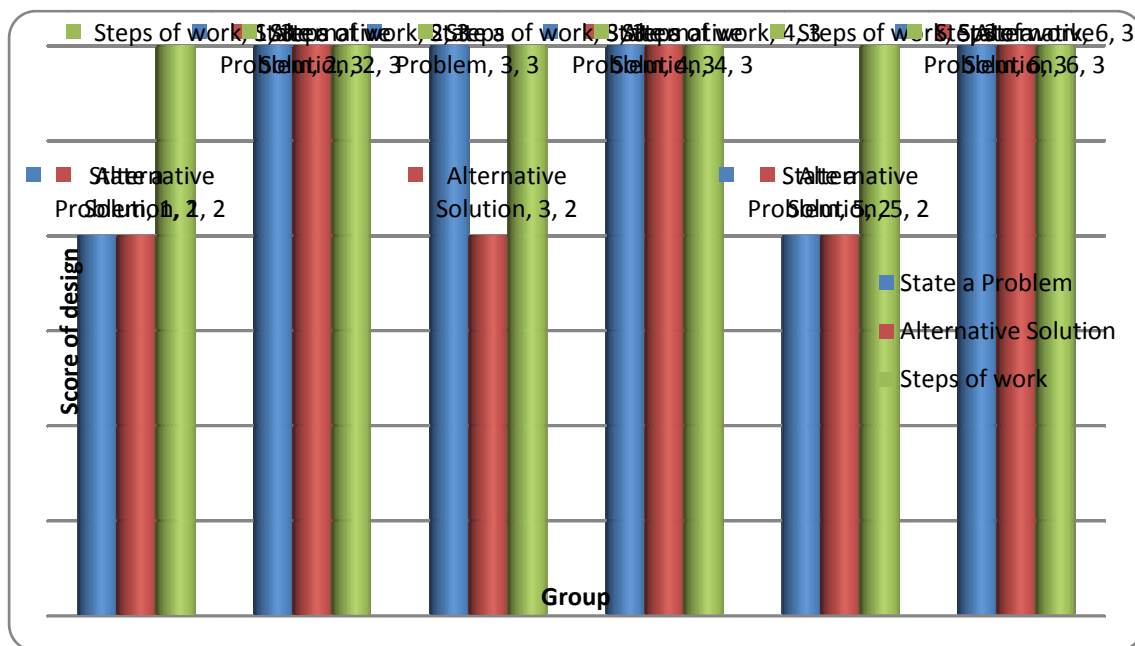


Figure 1. Results of scoring student project design

During the activity, several groups seen confusion in applying the design, making products made repeatedly because it does not correspond with the work which they construct, as in a group of six. A group of six keeps repeating create a winding newspapers, made the basket to form a pattern of pencil. A groups of four kept repeating to attach the pattern a home. Project work can be seen as a form of open-ended contextual activity based learning and that is a part of the learning process that gives a strong emphasis on problem solving as a collaborative effort undertaken in the learning process in a given period (Hung & Wong, 2000).

Creativity can be seen from the results of modification product, or create an original product that has never existed before. Creativity is an effort to make things work with the meaning and means or make something better. Before making anything better, lecturer can assign students to create designs product in advance with fill components design that is the problem, a solution, objectives and ways of working (Starko, 2005). To produce a product creatively, formerly designed it in such a way, not necessarily directly make but need to think about how to make. Therefore, the observation needs to be done for produced products in accordance with a design that has been made.

Based on observation it can be concluded that the creative ideas will continue to evolve as the process is done, the result is also supported by the research findings Fatmawati (2014) which states that the draft made by each group to draft fermentation products are reflected three times (3x) for some components of design, so it can be concluded students' ability in designing the fermented product needed guidance from the instructor. Exercising creativity can be done through constructive learning; one of them

is project based learning. This learning emphasis on learning a relatively long duration, students centered and integrated with practice and real-world issues.

Project-based learning has tremendous potential to make the learning experience more interesting and meaningful to learners, and learners become active in their learning. The teacher's role in project-based learning is as a companion, facilitator and understand of mind the learner (BIE 2007; Asiska, 2008). Project-based learning is learning to use the problem as an initial step in learning, finding and collecting data and information from various sources to solve a problem and integrate the student's knowledge, make decisions on a wide range of alternative solutions to problems, and move significantly to produce products with high creativity.

Step of learning in projectbased learning as developed by The George Lucas Educational Foundation (2005) consists of: (a) **start with the essential question;** Learning begins with the essential question which is questions that can give students assignments to perform an activity. b) **Design a plan for the project;** Planning is about the rules, the selection of activities that can support in answering the essential question, by integrating a variety of subjects as possible, and to know the tools and materials that can be accessed to assist the completion of the project (problem, alternative solutions, and work ways of working). c) **Create a schedule;** teachers and students collaboratively construct a schedule of events in completing the project. Activities in this stage include: (1) create a timeline for completing the project, (2) make the deadline completion of the project, (3) direct students to plan a new way, (4) guiding students as they make way not associated with the project, and (5) require the student to make an explanation (reason) about selection of a way. d) **Monitor the students and the progress of the project;** teachers responsible for conducting monitoring of activities student for completing the project. e) **assess the outcome;** assessment is done to assist teachers in measuring the achievement of standards, role in evaluating the progress of each student, giving feedback on the level of understanding that has been reached students, assist teachers in preparing subsequent learning strategies, and f) **Evaluate the experience;** at the end of learning process, teachers and students reflect on activities and results of projects already executed.

A teacher who masters the capabilities required to develop children's creativity in learning process because the ability of such creativity can be generated and developed through a learning process in the classroom. A person is said to be creative if able; 1) showed a lot of answers a problem, 2) provide a variety of solutions, 3) observations with no glued to a book or searching on internet and find to the field or looking directly to the source, 4) change something that is not helpful to be something that has added value, 5) combining the existing products. The five points were done in a different way, through a plan and a design that is full of creative ideas that exist within learners.

After learning completed, lecture give a quistionare to student for knowing information about their experience in learning process with lesson study system, following the result of the quistionare.

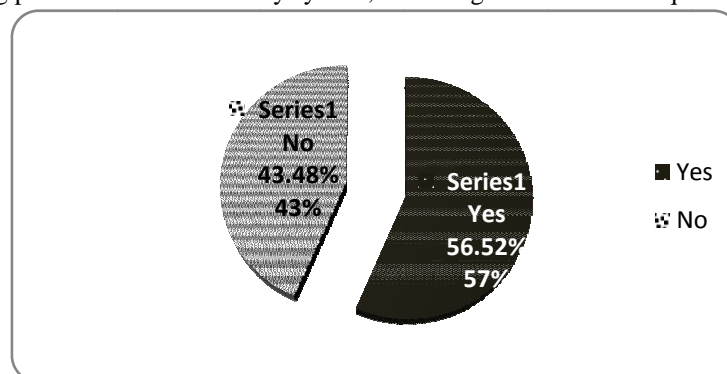


Figure 3: The response of students with lesson study system

A lesson study system get a positive response from all students, they are not nervous although observer seeing all of them in learning, more motivated to follow lectures, the quantitative results are presented in graph 3. Communication between them more active and aggressive in sense that they are

corrected opinion when forward the discussion results. Students more reticent to talk with other friends in the classroom.

Lesson Study is a systematic process that is used by teachers in Japan to test the effectiveness teaching in order to improve learning outcomes (Garfield, 2006). Lesson study is a model professional founding for educators through assessments and ongoing collaborative learning based on the principles of collegiality and mutual learning to build a learning community (Hendayana, 2007; Ibrahim, 2013).

Implementing Lesson Study in learning, will be able provide an opportunity for lecture to learning how to learn and learn about teaching. Suratno (2009) stated that the implementation Lesson study is believed to improve the basic knowledge in learning, improving the professionalism of educators, and build a learning community. The same is expressed by Copriady (2013) that the expansion of the learning process through the implementation Lesson study can be used as a professional development program. Perry and Lewis (2008) suggest the implementation of lesson study as a learning problem-solving solution, because the lesson study can facilitate whatever method is used (Lewis, 2002). A model founding lesson study can be used as a model for teaching founding for lecture toward students (Rustono, 2008). Lecturers need to think about lesson study as a way to improve the quality of teaching and improvement of learning process for students (Yoshida, 2012). Each lecture have advantages and disadvantages, there is no perfect learning process, so that lecturers must learn in order to teach better.

4. CONCLUSION

Project-based learning through lesson study have an impact on process of teaching and learning activities, all processes in the learning stages observed clearly beginning to the end, its mean that the activities previously carried out outside of school hours can be conditioned and all groups facilitated. However, students in process designing the necessary guidance be repeated to get a good project design, presentable, structured and systematic, and scientific. In making a product, be required another idea to apply the project design has been created.

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CHARACTER EDUCATION FOR PRISONERS SOFT SKILLS TO EMPOWER THROUGH ASINAN TRASIS IN THE CORRECTIONAL INSTITUTION NGAWI

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Abstract: The aim of this research is to give character education to empower soft skills through *Asinan Terasi* in the Correctional Institution Ngawi. *Asinan Terasi* (A modern innovation of traditional snacks) is a program to empower soft skills through training in making a modern traditional snack as a provision of skill and character education medium for the prisoners. Population of this research is all prisoners in LAPAS Ngawi (The Correctional Institution Ngawi). Sampling technique used is random sampling with total sample is 35 prisoners. Technique of collecting data used is observation, inquiry, interview, and documentation. Technique of data analysis is use Miles and Huberman's model consists of three components, they are data reduction, data display, and conclusion. According to the results of the research it can be concluded that observation results after the training show that the prisoners have soft skills in making *asinan trasi*, this activity grows positive characters as high confidence, discipline, and self-motivation to use soft skill as provision skill to create new work field for them. The superficial of the research results is the formed of training service of traditional snacks innovation, recipe book, and stand to inform the products made by the prisoners.

Keywords: Character Building, Soft Skill, *Asinan Terasi*, Prisoner

1. INTRODUCTION

The society perception of the prisoners or ex-prisoners is tend to be negative, therefore causing less confidence from the prisoners to be accepted in the society and the difficulties to get new job. Lembaga Perasyarakatan (LAPAS) or The Correctional Institution is a place to learn and founding for the prisoners to prepare themselves either physical or mental to back in the society and socialize well. Reksodiputro, Marjono, (1991 and 1994) stated that penal philosophy is consisting of retribution, utilitarian, special deterrence, and behavioral prevention decides the prisoner's treatments in LAPAS. LAPAS philosophy is quarantine to educate so that the prisoners can join back with their community without causing social flaming. Aswanto (1999) stated that LAPAS is not aimed to make people tortured in order to ban the pretension to repeat the actions which break the law, but LAPAS existence is effort to realized the prisoners or Warga Binaan Perasyarakatan (WBP) to repent their faults and return them to be a good citizen, follow the law and hold the high esteem of the moral values, social, and religion, therefore it can create a save, orderly, and peace society life. According to these opinions, LAPAS must direct in founding character and soft skill.

In fact, LAPAS tends to conduct a founding directing in character building, meanwhile the founding program to improve soft skill is lack. It caused by the lack of staff in giving the soft skill founding. The acceptance from society to the ex-prisoners is also lack. So there must be a balance between the character building and soft skill given by LAPAS to the prisoners.

The problem about the lacking of the balance between the character building and soft skill according to our observation results is also happen in LAPAS Ngawi. The founding emphasizes only in the character building as learn how to read Al-Quran and pray. Meanwhile, the soft skill founding given to the male and female prisoners is not optimum yet, such as farming, handicraft, paving making, and electricity weld. Based on this condition, it is needed to make an activity program which involves the male and female prisoners as a skill and character building effort.

Education for prisoner's character to empower soft skill through *Asinan Terasi* in LAPAS Ngawi is a training program of traditional snacks innovations with modern package. The training of making traditional snack innovation including: Nagasari Tepung Jagung, Ongol-Ongol Bihun, Getuk Keju, Lemper Bakar Serundeng Ikan Lele, Pisang Goreng Kerikil Keju, and Kue Kukus Manis Wortel. Through

this program, it is hoped it can be a provision skill and mean of character education for prisoners. This research program is also hoped can give an input for LAPAS to be more creative in giving program of founding skill and character to prisoners and cause the society caring.

The aims of this research either as character education or empower soft skill for prisoners, the training team will also make stand to give information to the society. The stand contains of founding photos as an effort to introduce the products made by the prisoners, it is hoped can change the negative perception of the society. So this research is not only as an empowered program but also a program that can motivate the prisoners to be a better person so they can be accepted by the society. This program is hoped can be a positive medium for the prisoners in LAPAS and be a provision to create new work field for themselves after the end of their arrest time.

2. RESEARCH METHODOLOGY

The research methodology is used to accelerate the run of this research by using qualitative research. Qualitative research is a research used to examine natural condition of an object where the researcher is the key instrument (Sugiyono, 2012). To give detailed picture of the founding activity in LAPAS Ngawi, the researchers use case study research method. Nazir (1983) case study research is used to determine subject's status, observation of a phase, specific or particular of the entire personal. Research subject can be an individual, group, institute, or society. This research has a formal object that is prisoners in LAPAS Ngawi and material object that is an activity program given to 35 prisoners as the founding and empowering effort.

The first technique of collecting data is conducted by determine the research object, either the formal object or material object. The formal object of this research is the prisoners of LAPAS Ngawi. Meanwhile the material object of this research is an activity program given to 35 prisoners as the founding and empowering effort. The technique of collecting sample used is random sampling with 35 prisoners of 277 with 10 female prisoners and 276 male prisoners. The reason underlying the chosen of material object has been stated in the introduction that is the lacking of soft skill and character founding.

The first method of collecting data is collecting field data. The first step used in collecting field data is observation, which conducted by observe directly in the field. The observation is conducted in LAPAS Ngawi especially about the founding activity given to the prisoners. The result gotten from the founding is more emphasize in the character founding, meanwhile the skill founding is not optimum yet and the founding program tends to be given to the male prisoners. The next step is spreading inquiry to the society to know their perception about the prisoners. The third step is interview by giving some question suitable with the research topic. The chosen informal object in this research is 10 prisoners who join the founding program in making Asinan Trasi in LAPAS Ngawi. The last step is documented the activity which has been conducted.

This research is conducted in LAPAS Ngawi as the only correctional institution in Ngawi. It is located on Jalan MH.Thamrin 35 Ngawi. The location is strategic in the middle of the city. The big amount of male prisoners than female prisoners causes the skill training is tend to be given to male prisoners while to female prisoners is not optimum yet, so the target of this research program is special for the entire female prisoners than the male prisoners. The societies around LAPAS are individualist and still consider the prisoners negatively. It caused the decrease of confidence and the trust of prisoners to be accepted back by the society. It also caused the difficulty for the ex-prisoners in getting jobs after the end of their arrest time. The time to conduct this research is start from April to Mei 2016.

3. DATA ANALYSIS

After all the data are collected, the next step is analysis and data tabulation. The technique of data analysis used is Miles and Huberman's model (2009) consists of three components, they are data reduction, data display, and conclusion. Data reduction is conducted to give more specific pictures and easier the researchers in collecting data according to the field data which have been processed. The data reduction is conducted through discussion with team and LAPAS staffs. After the data reduction, the next

analysis step is displaying the data. Data display is used to make the result of data reduction to be organized, arrange in connection patter, so it can be understand easily. The data display is in narrative form. The last step is summarizing the conclusion from all research processes based on the activity program which has been given to the prisoners.

4. THE RESULT AND DISCUSSION

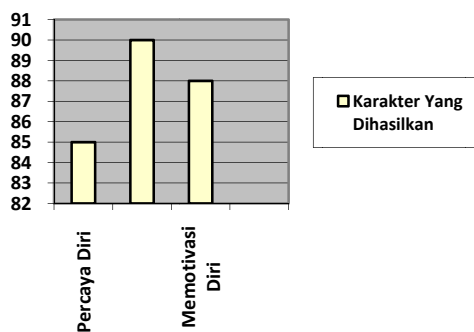
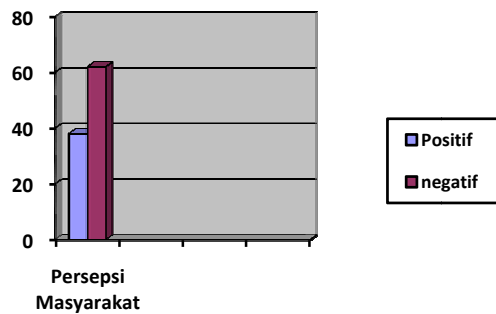
The founding is an effort, action, and activity conducting efficiently and effectively to get better results (KBBI: 2003). The main function of the founding covers three thing as follow:

- a. Delivering the information and knowledge.
- b. Changing and developing attitude.
- c. Exercise and developing skills.

(Mangundhardjana, 1986)

This opinion is used to determine the results of the conducted research program.

Based on the opinion and the conducted research, the results of this activity program can give positive response for the prisoners. Program research of Asinan Trasi can give skill for prisoners to innovate traditional snacks to be an attractive modern snack and potential to be sold in the market. It is not only skill got by the prisoners but also this activity can gain positive character as good confidence, work hard, discipline, and self-motivation. During the activity based on the observation and interview, it can see clearly if 85% of 35 participants have high spirit and enthusiastic in every activity given by the research team so their confidence is appearing. 90% of discipline character is showed by always keep everything clean, on time in following the training, and be responsible with everything they have done. At the beginning, the prisoners have never innovated traditional snacks yet, but with the training they can get knowledge and experience. 88% of prisoners can make traditional snacks after the training so this activity program can motivate them to gain money in their arrest time. 92% of LAPAS staffs support the prisoners to develop, moreover they can help to sell the products so the society can know the prisoner product. In long period of time, it is hoped can change the negative mindset of society, because according to the inquiry spread to 150 people show that 38% of society can change their negative mindset about the prisoners after showing the activities inside LAPAS and 62% of the rest still think negatively.



5. CONCLUSION

According to the conducted training, it can be conclude that the prisoners are very enthusiastic in following the activity from the beginning until end. They are enjoying every activity. The changing of attitude also can be seen from the prisoners after joining the training, as make them to be more confident. After they are able to make traditional snacks they feel that they can be useful people and develop their ability. They also work hard, even their arrest time is not end yet, and they have high spirit in making traditional snacks with new innovation which the selling is helped by LAPAS staffs. The training of Asinan Trasi makes them to be discipline in every activity, they always come on time, dress well, speak politely, and keep clean their environment because during the training all of this rules are applied so they start to accustomed.

Besides, they are motivated to use their new soft skill as provision to create new work field for themselves or other people when their arrest time is not end yet or after it end. The prisoners also have some ideas to innovate many kinds of other traditional snacks, they keep trying to create innovation of traditional snacks in order their products can be known by the society widely which later will change their negative mindset about prisoners to be positive mindset.

6. SUGGESTION

The prisoners are hoped to keep developing their skill after the training and share their knowledge to their new friends in LAPAS. Moreover, the prisoners can sell their products so it can be known widely in society and be their income. LAPAS side is hoped to keep supporting this program, so the prisoners can have skill which can be developed more. It is better if LAPAS side can give proper facilities for the continuation of the program, so the prisoners can develop their skill maximally. We hope this program of Asinan Trasi training can continue and be useful for everybody.

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POLA REFLEKSI YANG EFEKTIF DALAM *LESSON STUDY*

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Abstrak: Penelitian ini bertujuan untuk (1) Mendapatkan pola refleksi pembelajaran berbasis lesson study di STKIP PGRI Pasuruan dan desiminasi di SMK PGRI 4 dan SMP N 4 Kota Pasuruan sehingga dapat meningkatkan kualitas pelaksanaan *Lesson Study*, (2) Mengetahui pola refleksi yang efektif dalam pembelajaran berbasis *Lesson study*. Penelitian dilaksanakan di STKIP PGRI Pasuruan, SMK PGRI 4 dan SMP N 4 Kota Pasuruan, dengan subyek penelitian adalah dosen dan guru dalam melaksanakan pembelajaran berbasis *lesson study*. Penelitian dilakukan dengan menggunakan tahapan-tahapan yang berlaku dalam pembelajaran yang berbasis lesson study. Pelaksanaan penelitian berlangsung dalam 3 kegiatan di lembaga yang berbeda. Instrumen yang digunakan dalam penelitian ini meliputi : lembar observasi dan pengamatan penuh dalam kegiatan refleksi. Instrumen observasi disusun berdasarkan komponen dasar pembelajaran berbasis lesson study untuk mengetahui kualitas diskusi. Hasil penelitian yang telah dilaksanakan diperoleh pola refleksi diskusi yang terdiri dari beberapa tahap yaitu : (1) Diskusi refleksi dipimpin oleh seorang moderator dan ada notulis. (2) Dosen/guru model yang mengimplementasikan rencana perkuliahan oleh moderator diberikan kesempatan untuk menyampaikan kesan dan hal lain yang dipandang penting dalam mengimplementasikan rencana perkuliahan. (3) Para pengamat menyampaikan hal-hal penting dalam pelaksanaan perkuliahan yang perlu perbaikan atau perlu dilanjutkan pada siklus berikutnya. Hal yang disampaikan oleh pengamat harus didasarkan pada hasil analisis dari pengamatannya, bukan hanya berdasar pada teori atau opini. (4) Agar pelaksanaan refleksi berjalan dengan baik, maka perlu diperhatikan rambu-rambu dalam menyampaikan komentar dalam diskusi refleksi berikut ini. (a) Komentar yang disampaikan sebaiknya terfokus pada masalah proses belajar mahasiswa/siswa, bukan pada aktivitas dosen dalam mengajar. (b) Apabila terkait dengan kinerja dosen saran yang disampaikan sebaiknya dengan memperbanyak pujian positif dan sesedikit mungkin kritik negatif. (c) Komentar yang disampaikan harus berdasarkan data pengamatan saat observasi, bukan bagaimana seharusnya berdasar keinginan pengamat. (d) Gunakanlah nada yang lembut dan pilihan kata yang halus. (e) Komentar yang disampaikan sebaiknya jauh dari sifat “menggurui” atau menurut pandangannya sendiri. (f) Jika menyampaikan data tentang mahasiswa/siswa belajar, kemukakan MENGAPA hal itu terjadi (ini merupakan interpretasi) dan bagaimana jalan keluarnya (ini merupakan saran untuk perbaikan pembelajaran selanjutnya). (g) Kemukakan juga pelajaran apa yang dapat dipetik dari permasalahan tersebut. (5) Jika ada pakar/narasumber yang hadir maka diberi kesempatan untuk menyampaikan komentar akhir, untuk memberi masukan tentang pembelajaran atau proses *Lesson Study*. (6) Pada akhir kegiatan diskusi refleksi moderator menyampaikan ringkasan hasil diskusi atau kesimpulan yang dianggap penting. Hasil tersebut berupa hal-hal yang baik untuk dilanjutkan dan saran-saran perbaikan sebagai pertimbangan dalam menyusun perencanaan perkuliahan berikutnya.

Kata Kunci: *Pola, Refleksi, Lesson Study*

1. PENDAHULUAN

Refleksi adalah Kegiatan diskusi formal yang membahas hasil pengamatan terhadap pelaksanaan pembelajaran oleh dosen/guru pengajar. Diskusi ini dipimpin oleh seorang moderator dan dibantu oleh notulis. Refleksi yang diawali dengan memberikan kesempatan dosen/guru model untuk menyampaikan perasaannya sebelum, saat, dan setelah mengajar ini, dimaksudkan untuk meningkatkan kualitas pembelajaran berikutnya bagi dosen/guru model, sekaligus sebagai refleksi diri bagi pengamat. Fokus diskusi diarahkan pada perilaku siswa, bukan ‘mengadili’ dosen/guru model.

Refleksi diikuti oleh semua anggota kelompok yang mengkaji hasil pengamatan setiap dosen/guru dan hasil rekaman proses pembelajaran. Kegiatan Menurut Djamilah (2006), dengan pemahaman bahwa lesson study adalah forum untuk saling belajar dalam upaya mengembangkan kompetensi masing-masing anggota tim, maka semangat dalam tahap refleksi ini adalah secara bersama-sama menemukan solusi untuk masalah yang muncul agar pembelajaran berikutnya dapat dipersiapkan dan dilaksanakan dengan lebih baik. Dengan demikian, perlu dipahami bahwa kegiatan refleksi bukan dimaksudkan untuk menilai kemampuan mengajar dosen/guru model. Meskipun semangat yang terkandung di dalam lesson study adalah saling belajar, namun mengingat budaya kita yang belum terbiasa dan tidak mudah untuk menerima kritik secara langsung, maka disarankan fokus evaluasi adalah pada bagaimana respon mahasiswa/siswa terhadap pembelajaran yang dilaksanakan. Oleh karena itu, dosen/guru lain sebagai observer/pengamat diharuskan mendengarkan, mengamati, dan mencatat setiap respon mahasiswa/siswa dengan rinci dan teliti. Diharapkan, dosen/guru model dapat menarik kesimpulan atas pembelajaran yang ia laksanakan, berdasarkan hasil evaluasi terhadap respon mahasiswa/siswa dari hasil pengamatan dosen/guru lain dan dari hasil rekaman video. Dengan memperhatikan bagaimana mahasiswa/siswa belajar, diharapkan dosen/guru yang bersangkutan menemukan kekurangan dan kelebihan dalam mengajar. Dalam refleksi Bagaimana Membagi Temuan? Berbagai temuan positif yang didapatkan selama kegiatan lesson study sebaiknya disebarluaskan (sharing) kepada dosen/guru lain agar dapat memperoleh manfaat yang sama. Penyebarluasan dapat dilakukan melalui forum seminar hasil lesson study, MGMP atau pertemuan guru di sekolah. Agar kemanfaatan dapat disebarluaskan dalam skala luas, sharing dapat dilakukan melalui forum seminar, atau menuliskannya jurnal ilmiah. Bagaimana Mengatasi Kendala? Berbagai kendala yang mungkin dihadapi ketika mengimplementasikan lesson study di antaranya adalah adanya persepsi yang keliru tentang lesson study, penyusunan jadwal, pendanaan, setting kelas, dan pendokumentasian. Untuk menghindari adanya kesalahan persepsi tentang lesson study, pada tahap perencanaan perlu diadakan penyamaan persepsi antaranggota kelompok bahwa lesson study lebih dimaksudkan untuk meningkatkan kualitas pembelajaran, dan bukan untuk menilai dosen/guru. Menyusun jadwal, baik untuk pertemuan koordinasi persiapan pelaksanaan, pelaksanaan lesson study itu sendiri, maupun untuk melaksanakan refleksi dan menyusun temuan, yang melibatkan 4 – 6 dosen/guru, tidaklah mudah. Itulah sebabnya pelibatan rektor/kepala sekolah sejak awal perencanaan lesson study sangat penting, tidak hanya untuk mendapatkan kemudahan dalam pengaturan jadwal, tetapi juga diharapkan rektor/kepala sekolah memberikan dukungannya dalam bentuk pendanaan untuk pelaksanaan setiap kegiatan dalam lesson study. Kesepakatan tentang jadwal, pendanaan, dan “aturan main” dari awal akan menghindari masalah yang tidak diinginkan.

Berangkat dari permasalahan ini peneliti ingin mencoba mengubah refleksi yang selama ini menghakimi dosen/guru menjadi pola refleksi yang membangun kepercayaan dosen/guru untuk berani menjadi dosen/guru model karena lesson Study merupakan model peningkatan mutu pembelajaran melalui pengkajian pembelajaran secara kolaboratif dan berkelanjutan berlandaskan prinsip-prinsip kolegalitas dan mutual learning, untuk membangun learning community (Lewis,2002).

2. KERANGKA TEORI

Lesson study dikembangkan pertama kali di Jepang yang dilaksanakan sebagai program pengembangan profesional guru. Lesson study dipercaya berhasil dalam meningkatkan praktik pembelajaran. Menurut Dannis Sparks (1999), lesson study adalah suatu proses kolaboratif dimana sekelompok guru mengidentifikasi masalah-masalah pembelajaran, merencanakan suatu perbaikan

pembelajaran, melaksanakan pembelajaran (salah satu guru dalam kelompok guru mengajarkannya, sementara guru lain sebagai pengamat), mengevaluasi dan merevisi pembelajarannya, mengajarkan pembelajaran yang telah direvisi, mengevaluasi lagi, dan berbagi (menyebarkan) 2 hasilnya kepada guru-guru lain. Sementara Shelley Friedkin (2005) mendefinisikan lesson study sebagai suatu proses yang melibatkan guru yang bekerja sama untuk merencanakan, mengobservasi, menganalisis, dan memperbaiki pembelajarannya. Pembelajaran dalam lesson study sering disebut sebagai “research lesson” atau pembelajaran penelitian. Secara lebih singkat, lesson study diartikan sebagai proses profesional yang melibatkan sekelompok guru yang merencanakan, mengobservasi, dan memperbaiki pembelajarannya (Northwest Regional Educational Laboratory, 2004). Sukirman (2006) memandang lesson study sebagai model pembinaan profesi pendidik melalui pengkajian pembelajaran secara kolaboratif dan berkelanjutan berdasarkan prinsip-prinsip kolegalitas dan mutual learning untuk membangun learning community. Dengan demikian lesson study bukan suatu metode pembelajaran atau strategi pembelajaran. Namun demikian, dalam suatu kegiatan lesson study dapat digunakan berbagai metode, strategi, atau pendekatan pembelajaran yang sesuai dengan situasi, kondisi, dan permasalahan yang dihadapi pendidik. Mengacu pada beberapa pengertian di atas, lesson study secara lebih lengkap dapat diartikan sebagai suatu proses kolaboratif dari sekelompok guru untuk secara bersama-sama: (1) mengidentifikasi masalah pembelajaran yang dirasakan oleh guru (salah satu atau sekelompok guru) (2) merencanakan langkah-langkah pembelajaran (sebagai upaya pemecahan masalah yang teridentifikasi), (3) melaksanakan pembelajaran yang dilakukan oleh salah satu guru yang dipilih (disepakati), sementara guru lain mengobservasi proses pembelajaran, (4) mengevaluasi proses pembelajaran yang telah dilakukan (5) memperbaiki perencanaan pembelajaran berdasarkan hasil evaluasi (6) melaksanakan pembelajaran lagi, (7) mengevaluasi kembali pembelajaran yang telah dilaksanakan, dan (8) membagi (menyebarkan) pengalaman dan temuan dari hasil evaluasi tersebut kepada guru lain.

Lesson study memberikan banyak hal yang menurut para peneliti dianggap efektif dalam mengubah praktik mengajar guru seperti penggunaan materi pembelajaran yang konkrit untuk memfokuskan pada permasalahan agar lebih bermakna, mengambil konteks pembelajaran dan pengalaman guru yang eksplisit, dan juga memberikan dukungan pada guru dalam hubungan sejawat. Dengan kata lain, lesson study memberikan banyak kesempatan kepada para guru untuk membuat bermakna ide-ide pendidikan dalam praktik mengajar mereka, untuk mengubah perspektif mereka tentang pembelajaran, dan untuk belajar mengamati praktik mengajar mereka dari perspektif siswa. Dalam lesson study, kita melihat apa yang terjadi dalam pembelajaran lebih objektif dan itu membantu kita memahami ide-ide penting tanpa harus lebih memperhatikan isu-isu lain dalam kelas kita” (Murata & Takahashi, 2002). Menurut Lewis (Akihito Takashi, 2006), lesson study mempromosikan dan mengelola kerja kolaboratif antar guru dengan memberi dukungan dan intervensi sistematis. Selama lesson study, para guru berkolaborasi untuk: merumuskan tujuan-tujuan jangka panjang untuk pengembangan dan belajar siswa; merencanakan dan melaksanakan pembelajaran yang berdasar pada penelitian dan observasi untuk mengaplikasikan tujuan-tujuan jangka panjang ke dalam praktek-praktek kelas untuk isi-isi akademik khusus; mengobservasi secara hati-hati tingkat belajar siswa, keterlibatan mereka, dan perilaku mereka selama pembelajaran; melaksanakan diskusi setelah pembelajaran bersama kelompok kolaboratif mereka untuk mendiskusikan dan merevisi pembelajaran yang sesuai.

Kegiatan Refleksi Segera setelah selesai pembelajaran, dilakukan postclass discussion atau kegiatan refleksi. Refleksi diikuti oleh semua anggota kelompok yang mengkaji hasil pengamatan setiap guru dan hasil rekaman proses pembelajaran. Kegiatan Menurut Djamilah (2006), dengan pemahaman bahwa lesson study adalah forum untuk saling belajar dalam upaya mengembangkan kompetensi masing-masing anggota tim, maka semangat dalam tahap refleksi ini adalah secara bersama-sama menemukan solusi untuk masalah yang muncul agar pembelajaran berikutnya dapat dipersiapkan dan dilaksanakan dengan lebih baik. Dengan demikian, perlu dipahami bahwa kegiatan refleksi bukan dimaksudkan untuk menilai kemampuan mengajar guru model. Meskipun semangat yang terkandung di dalam lesson study adalah saling belajar, namun mengingat budaya kita yang belum terbiasa dan tidak mudah untuk menerima kritik secara langsung, maka disarankan fokus evaluasi adalah pada bagaimana respon siswa

terhadap pembelajaran yang dilaksanakan. Oleh karena itu, guru lain sebagai observer/pengamat diharuskan mendengarkan, mengamati, dan mencatat setiap respon siswa dengan rinci dan teliti. Diharapkan, guru model dapat menarik kesimpulan atas pembelajaran yang ia laksanakan, berdasarkan hasil evaluasi terhadap respon siswa dari hasil pengamatan guru lain dan dari hasil rekaman video. Dengan memperhatikan bagaimana siswa belajar, diharapkan guru yang bersangkutan menemukan kekurangan dan kelebihan dalam mengajar.

Berbagai temuan positif yang didapatkan selama kegiatan lesson study sebaiknya disebarluaskan (sharing) kepada guru lain agar dapat memperoleh manfaat yang sama. Penyebarluasan dapat dilakukan melalui forum MGMP atau pertemuan guru di sekolah. Agar kemanfaatan dapat disebarluaskan dalam skala luas, sharing dapat dilakukan melalui forum seminar, atau menuliskannya jurnal ilmiah.

Berbagai kendala yang mungkin dihadapi ketika mengimplementasikan lesson study di antaranya adalah adanya persepsi yang keliru tentang lesson study, penyusunan jadwal, pendanaan, setting kelas, dan pendokumentasian. Untuk menghindari adanya kesalahan persepsi tentang lesson study, pada tahap perencanaan perlu diadakan penyamaan persepsi antar anggota kelompok bahwa lesson study lebih dimaksudkan untuk meningkatkan kualitas pembelajaran, dan bukan untuk menilai guru. Menyusun jadwal, baik untuk pertemuan koordinasi persiapan pelaksanaan, pelaksanaan lesson study itu sendiri, maupun untuk melaksanakan refleksi dan menyusun temuan, yang melibatkan 4 – 6 guru, tidaklah mudah. Itulah sebabnya pelibatan kepala sekolah sejak awal perencanaan lesson study sangat penting, tidak hanya untuk mendapatkan kemudahan dalam pengaturan jadwal, tetapi juga diharapkan kepala sekolah memberikan dukungannya dalam bentuk pendanaan untuk pelaksanaan setiap kegiatan dalam lesson study. Kesepakatan tentang jadwal, pendanaan, dan “aturan main” dari awal akan menghindari masalah yang tidak diinginkan.

3. METODE PENELITIAN

Penelitian dilaksanakan di STKIP PGRI Pasuruan, SMK PGRI 4 dan SMP N 4 Kota Pasuruan, dengan subyek penelitian adalah dosen dan guru dalam melaksanakan pembelajaran berbasis *lesson study*. Penelitian dilakukan dengan menggunakan tahapan-tahapan yang berlaku dalam pembelajaran yang berbasis lesson study. Pelaksanaan penelitian berlangsung dalam 3 kegiatan di lembaga yang berbeda. Instrumen yang digunakan dalam penelitian ini meliputi : lembar observasi dan pengamatan penuh dalam kegiatan refleksi. Instrumen observasi disusun berdasarkan komponen dasar pembelajaran berbasis lesson study untuk mengetahui kualitas diskusi.

4. PEMBAHASAN

Temuan peneliti dalam kegiatan lesson studi di STKIP PGRI Pasuruan, SMK PGRI 4 dan SMPN 4 Kota Pasuruan sebagai berikut:

Bahwa pengalaman refleksi yang di lakukan di kampus setelah beberapa kegiatan open class membuat refleksi yang di lakukan di sekolah binaan menjadi sangat efektif, dan tepat sasaran. Ini merupakan pola refleksi yang peneliti buat dalam beberapa kegiatan refleksi di kampus:

Setelah selesai melaksanakan implementasi rencana perkuliahan dan observasi langsung dilakukan kegiatan refleksi, dengan acara sebagai berikut.

1. Diskusi refleksi dipimpin oleh seorang moderator dan kalau perlu ada notulis.
2. Lebih dulu dosen yang mengimplementasikan rencana perkuliahan (dosen model) oleh moderator diberikan kesempatan untuk menyampaikan kesan dan hal lain yang dipandang penting dalam mengimplementasikan rencana perkuliahan.
3. Para pengamat menyampaikan tanggapan atau hal-hal penting dalam pelaksanaan perkuliahan yang perlu perbaikan atau perlu dilanjutkan pada siklus berikutnya. Hal yang disampaikan oleh pengamat harus didasarkan pada hasil analisis dari pengamatannya, bukan hanya berdasar pada teori atau opini.

4. Agar pelaksanaan refleksi berjalan dengan baik, maka perlu diperhatikan rambu-rambu dalam menyampaikan komentar dalam diskusi refleksi berikut ini.
 - a. Komentar yang disampaikan sebaiknya terfokus pada masalah proses belajar mahasiswa, bukan pada aktivitas dosen dalam mengajar.
 - b. Apabila terkait dengan kinerja dosen saran yang disampaikan sebaiknya dengan memperbanyak pujian positif dan sesedikit mungkin kritik negatif.
 - c. Komentar yang disampaikan harus berdasarkan data pengamatan saat observasi, bukan bagaimana seharusnya berdasar keinginan pengamat. Artinya jauhan dari komentar yang "menggurui" dosen model.
 - d. Gunakanlah nada yang lembut dan pilihan kata yang halus
 - e. Komentar yang disampaikan sebaiknya jauh dari sifat "menggurui" atau menurut pandangannya sendiri
 - f. Jika menyampaikan data tentang mahasiswa belajar, kemukakan MENGAPA hal itu terjadi (ini merupakan interpretasi) dan bagaimana jalan keluarnya (ini merupakan saran untuk perbaikan pembelajaran selanjutnya).
 - g. Kemukakan juga pelajaran apa yang dapat dipetik dari permasalahan tersebut
5. Jika ada pakar/narasumber yang hadir maka diberi kesempatan untuk menyampaikan komentar akhir, untuk memberi masukan tentang pembelajaran atau proses *Lesson Study*.
6. Pada akhir kegiatan diskusi refleksi moderator menyampaikan ringkasan hasil diskusi atau kesimpulan yang dianggap penting. Hasil tersebut berupa hal-hal yang baik untuk dilanjutkan dan saran-saran perbaikan sebagai pertimbangan dalam menyusun perencanaan perkuliahan berikutnya.

Pola ini menurut peneliti ringkas dan efektif, di bandingkan dengan pola di dalam buku *Buku Lesson study (Studi Pembelajaran)* oleh Istamar Syamsuri dan Ibrohim, (2008) sebagai berikut;

5. TEKNIK MODERASI DALAM DISKUSI REFLEKSI

Berikut akan diuraikan hal-hal penting yang perlu diperhatikan oleh moderator dalam memimpin diskusi refleksi agar diskusi berlangsung kondusif, interaktif dan efektif. Namun demikian, perlu dipahami bahwa rambu-rambu ini hanyalah sebuah contoh berdasarkan pengalaman. Artinya pembaca diharapkan dapat mengembangkannya sesuai dengan situasi dan kondisi di daerah masing-masing.

A. Membuka dan Mengawali Diskusi Refleksi

- 1) Moderator adalah "orang kunci" yang dapat menghidupkan suasana diskusi.
- 2) Seorang moderator dalam diskusi refleksi *lesson study* bukan hanya harus pandai berbicara sesuai situasi, tetapi ia juga harus memahami isi setiap pembicaraan. Oleh karena itu, moderator juga harus mengikuti dan mencermati semua situasi/kejadian pembelajaran yang akan direfleksikan.
- 3) Ketika mengawali dan membuka suasana diskusi, upayakan untuk menyegarkan suasana pertemuan, yang umumnya para pengamat dan peserta *lesson study* sudah mulai lelah karena sebelumnya berdiri lama dalam melakukan observasi. Hal ini dapat dilakukan misalnya dengan menyapa beberapa orang yang sudah dikenal atau mengenalkan beberapa orang peserta atau tamu yang belum dikenal peserta pada umumnya. Jangan lupa memberikan komentar awal yang arahnya memberikan penghargaan atau sanjungan untuk memberikan dukungan moral kepada guru model.
- 4) Sampaikan ucapan terima kasih kepada guru model atas sajian pembelajaran yang telah dibuat dan berikan penghargaan, misalnya berupa tepuk tangan dari semua peserta.

B. Refleksi Diri Guru Model

- 1) Pada saat memberi kesempatan guru model untuk menyampaikan refleksi, sampaikanlah rambu-rambu apa saja yang perlu diungkapkan oleh guru model, antara lain sebagai berikut.
 - a. Guru tidak hanya mengungkapkan perasaan senang, sedih, bangga atau kurang puas dengan hasil mempraktikkan skenario pembelajaran yang telah dirancang/dipersiapkan.

- b. Guru model perlu menyampaikan ringkasan alur langkah-langkah pembelajaran, terutama untuk mengulas hal-hal yang menarik, baik itu ketidakterlaksanaan langkah-langkah pembelajaran maupun kasus-kasus menarik pada langkah tersebut.
- c. Untuk melengkapi refleksi diri, guru model dapat menyebutkan kira-kira persentase ketercapaian skenario pembelajaran yang telah dibuat.

C. Membagi Tahap dan Melaksanakan Diskusi

1. Agar diskusi lebih terfokus dan terarah, sebaiknya waktu diskusi dibagi menjadi beberapa tahap dengan masing-masing tahap mengacu pada permasalahan tertentu. Misalnya ada tahap yang khusus membahas tentang:
 - interaksi siswa-siswa dalam kelompok maupun dalam presentasi hasil diskusi/kerja kelompok,
 - interaksi siswa dengan media belajar,
 - interaksi siswa dengan guru,
 - lompatan-lompatan belajar yang dibuat oleh beberapa siswa,
 - pengalaman-pengalaman berharga yang dapat diperoleh dari kegiatan observasi,Tema-tema tersebut dapat diatur secara fleksibel sesuai dengan situasinya.
2. Setelah tahap diskusi dibuka, berikan kesempatan kepada beberapa orang untuk mengemukakan temuan hasil pengamatan yang menarik untuk diulas dan yang sesuai dengan tema tahap diskusi. Komentar sebaiknya disertai dengan mengemukakan fakta atau data konkret hasil pengamatan, misalnya dengan menunjukkan kelompok atau nama siswa. Kendalikan agar setiap orang menyampaikan komentar sesuai dengan tema dan dalam bahasa yang ringkas tapi jelas. Hindarkan uraian komentar yang berbelit-belit.
3. Di dalam menyampaikan temuan dari hasil observasi, sebaiknya guru tidak membaca catatan dalam lembar observasi secara keseluruhan, tetapi disarankan untuk memilih bagian catatan yang terkait dengan tema. Jika ada komentar yang mulai menyimpang dari tema, sebaiknya diingatkan untuk kembali menyampaikan komentar yang sesuai dengan tema yang didiskusikan.
4. Jika ada pertanyaan klarifikasi atau komentar dari peserta di luar tema atau di luar konteks *lesson study* maka moderator harus dapat mengurangi hal tersebut untuk tidak diteruskan, misalnya dengan cara mengatakan "hal tersebut akan kita bahas di lain kesempatan".
5. Setelah seseorang atau beberapa orang menyampaikan komentar terkait dengan temuannya, moderator harus berusaha untuk menangkap esensi dan hal menarik yang perlu dibahas lebih jauh terkait dengan penyebab munculnya fenomena tersebut dan alternatif solusi yang diusulkan.
6. Setelah beberapa temuan menarik yang sejenis (sesuai tema) diungkapkan oleh beberapa pengamat, berikutnya lemparkan masalah tersebut kepada peserta yang lain untuk ditanggapi, terutama pada ulasan tentang kemungkinan penyebab munculnya fenomena tersebut dan kemungkinan alternatif solusinya.
7. Dalam memberikan masukan tentang alternatif solusi suatu permasalahan disarankan agar pengusul mendasarkan usulan tersebut pada pengalaman praktis di sekolah masing-masing atau rujukan teori atau kalangan pakar pendidikan.
8. Perhatian dan konsentrasi moderator harus selalu fokus pada setiap komentar yang disampaikan peserta, dan selalu dapat berpikir "Bagaimana membuat situasi diskusi lebih hidup, menarik, dan tidak membosankan. Jika ada ucapan dari pengamat atau kejadian-kejadian kecil tertentu yang memungkinkan dijadikan bahan yang lucu-lucu atau humor maka upayakan untuk dimunculkan dengan sedikit "dibumbui" agar menyegarkan suasana.
9. Upayakan untuk memberikan kesempatan yang merata kepada semua peserta diskusi. Oleh karena itu, hindarkan adanya dominasi komentar atau bicara pada orang tertentu. Jika ingin membatasi komentar peserta yang terlalu panjang, maka sampaikanlah dengan bahasa yang halus, dengan sedikit gurauan atau permintaan maaf. Tunjuk atau mintalah kepada salah satu atau beberapa peserta yang kelihatan pasif untuk menyampaikan pendapat terkait dengan hal yang sedang dibahas, misalnya dengan meminta seseorang untuk berpendapat setuju atau tidak setuju terhadap pendapat yang lain.

10. Pada akhir setiap tahap, moderator harus berusaha untuk memberikan ulasan singkat, semacam resume, dari hal yang didiskusikan pada tahap tersebut. Hati-hati agar moderator tidak membuat kesimpulan yang merupakan keputusan yang paling benar, atau seolah-olah diskusi tersebut telah menghasilkan satu aturan yang berlaku umum. Biarlah kesimpulan akhir dirumuskan sendiri oleh masing-masing peserta dan menjadi "good practices" yang akan dicoba untuk diimplementasikan di sekolah masing-masing sesuai dengan situasi dan kondisi yang ada.
11. Setelah tahap pertama selesai diskusi dilanjutkan ke tahap berikutnya dengan tema atau fokus diskusi yang lain. Selesai dalam arti masalah yang muncul, kemungkinan penyebab dan alternatif solusinya telah dibahas secara tuntas. Begitu seterusnya sampai semua masalah yang muncul didiskusikan.
12. Pada setiap akhir tahap moderator dapat memberikan kesempatan kepada guru model untuk memberikan tanggapan. Hindarkan tanggapan dari guru model yang terkesan "terlalu membela diri" atau mencari pembenaran atas kejadian atau kekurangan yang ada.
13. Nara sumber (Dosen dan atau Guru Pemandu) diberi kesempatan untuk menyampaikan komentar singkat terkait dengan fokus diskusi suatu tahap, atau diberi kesempatan berkomentar pada akhir sesi sebelum refleksi ditutup. Sebaiknya diberikan tekanan pada narasumber hal penting yang diharapkan mendapatkan ulasan, selain ulasan yang telah dipersiapkan sendiri oleh narasumber.
14. Jika ada masukan yang sangat berarti untuk skenario pembelajaran atau perangkat pembelajaran, maka sarankan agar RPP segera direvisi oleh guru model atau oleh kelompok.

D. Mengakhiri Diskusi Refleksi

1. Sebelum menutup forum diskusi refleksi moderator dapat menyampaikan ringkasan atau penegasan tentang hal-hal penting yang telah didiskusikan.
2. Saat menutup jangan lupa menyampaikan ucapan terima kasih pada semua pihak yang telah berpartisipasi, misalnya kehadiran Dosen, Guru Pemandu, Kepala Sekolah, Pengawas Sekolah, Dinas Pendidikan, dll.

6. PENUTUP

Kegiatan refleksi merupakan bagian yang sangat penting dari lesson study. Bahkan dapat dikatakan keberhasilan sebuah kegiatan lesson study dapat dilihat dari refleksinya. Pembelajaran yang sudah disusun skenarionya, dapat berhasil dilaksanakan dikelas atau sepenuhnya tidak berhasil. Perlu di ketahui bahwa tidak ada pembelajaran yang sempurna. Kekurangan yang terjadi di sana sini merupakan temuan yang akan memberikan masukan untuk perbaikan pada pembelajaran berikutnya. Banyak hal menarik yang terjadi ketika refleksi di lakukan sehingga harus di catat dan menjadi bahan diksusi pada refleksi.

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**PENERAPAN MODEL PEMBELAJARAN INQUIRI BERBASIS *LESSON STUDY* UNTUK
MENINGKATKAN KEMAMPUAN BERFIKIR KRITIS DAN HASIL BELAJAR PADA
MATAKULIAH PENGETAHUAN LINGKUNGAN PROGRAM STUDI PENDIDIKAN
BIOLOGI UNIVERSITAS MUHAMMADIYAH MALANG**

*The Application of Inquiri Learning Model based on Lesson Study to Improve Student's Critical
Thinking Ability and Learning Result on Subjects Knowledge Environment Departmen Biology
Education University of Muhammadiyah Malang*

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Abstrak: Kemampuan berfikir kritis dan hasil belajar menjadi aspek yang ditingkatkan dalam upaya mengembangkan disiplin intelektual dan ketrampilan yang dibutuhkan peserta didik. Cara menyampaikan pembelajaran dengan mengembangkan berfikir ilmiah dimana peserta didik mengasimilasi suatu konsep atau prinsip, mengamati, menggolongkan, membuat dugaan, menjelaskan, mengukur, dan membuat kesimpulan untuk membantu memecahkan masalah atas pertanyaan-pertanyaan dan rasa ingin tahu, sehingga peserta didik mampu mengasah kemampuan berpikirnya dan mampu mencapai tujuan pembelajaran yang diharapkan. Penelitian ini bertujuan; mengetahui perbedaan dan menganalisis peningkatan kemampuan berfikir kritis dan hasil belajar peserta didik setelah diterapkan model pembelajaran inquiri. Hasil penelitian ini menunjukkan bahwa kelima aspek kemampuan berpikir kritis; 1) mendefinisikan masalah, 2) pemahaman tentang kedalaman dan keluasan masalah, 3) sikap terhadap sudut pandang yang berbeda, 4) identifikasi konsep, dan 5) merumuskan alternatif pemecahan masalah meningkat dan dikategori sedang atau mencapai kategori cukup, sedangkan hasil belajar enunjukkan semua mahasiswa mengalami ketuntasan belajar.

Kata Kunci: Inquiri, Kritis, Hasil, Lesson Study

1. PENDAHULUAN

Pembelajaran menggunakan metode konvensional kurang tepat untuk mengimbangi kemampuan berfikir kritis. Kegiatan belajar yang hanya berdasarkan pada perintah atau tugas-tugas yang diberikan oleh pendidik akan mengakibatkan peserta didik tidak terlibat secara maksimal dalam proses pembelajaran, sehingga peserta didik belum bisa membentuk konsepnya sendiri.

Tujuan umum pengajaran biologi yaitu untuk mengembangkan sumber daya manusia yang memiliki keterampilan intelektual dan psikomotor dalam bidang biologi yang dilandasi sikap ilmiah. Menciptakan sumber daya manusia yang mampu berpikir kritis sangat berkaitan dengan dunia pendidikan sebagai tempat pembinaan. Pengembangan keterampilan, sikap, dan nilai ilmiah pada diri peserta didik sangat berkaitan dengan pengembangan keterampilan berpikir kritis peserta didik. Pengembangan keterampilan berpikir kritis sangat penting, hal ini didukung oleh Siegel (dalam Splitter, 1992) yang menganggap keterampilan berpikir kritis sebagai hal yang mendasar dalam pendidikan.

Menurut Lestari *et al* (2015) berpikir kritis adalah berpikir secara beralasan dan reflektif dengan menekankan pada pembuatan keputusan tentang apa yang harus dipercayai atau dilakukan. Oleh karena itu, indikator kemampuan berpikir kritis dapat diturunkan dari aktivitas kritis sebagai berikut; a) Mencari pernyataan atau pertanyaan yang jelas artinya atau maksudnya, b) Mencari dasar atas suatu pernyataan, c) Berusaha untuk memperoleh informasi terkini, d) Menggunakan dan menyebutkan sumber yang dapat dipercaya, e) Mempertimbangkan situasi secara menyeluruh, f) Berusaha relevan dengan pokok pembicaraan, g) Berusaha mengingat pertimbangan awal atau dasar, h) Mencari alternatif-alternatif, i) Bersikap terbuka, j) Mengambil posisi (atau mengubah posisi). apabila bukti-bukti dan dasar dasar sudah cukup baginya untuk menentukan posisinya, k) Mencari ketepatan seteliti-telitinya, l) Berurusan dengan bagian-bagian secara berurutan hingga mencapai seluruh keseluruhan yang kompleks, m) Menggunakan kemampuan atau ketrampilan kritisnya sendiri, n) Peka terhadap perasaan, tingkat pengetahuan dan tingkat kerumitan berpikir orang lain, o) Menggunakan kemampuan berpikir kritis orang lain.

Marzano (1992) menyebut keterampilan berpikir sebagai "*Habits of Mind*". *Habits of mind* digunakan sebagai respons terhadap pertanyaan dan jawaban masalah yang tidak segera diketahui, sehingga guru dapat mengobservasi bagaimana siswa menghasilkan sebuah pengetahuan daripada hanya

mengingat pengetahuan. Atribut kritis dan kecerdasan manusia bukan hanya memperoleh pengetahuan tetapi juga mengetahui cara mengamalkannya. *Habits of mind* berarti memiliki watak berperilaku secara cerdas ketika menghadapi masalah, atau terhadap jawaban yang tidak segera diketahui (Costa, 2000; Costa & Kallick, 2000)

Model pembelajaran inquiri dapat melibatkan peserta didik kedalam penyelidikan, mengidentifikasi, dan mencari solusi terhadap suatu masalah yang sesungguhnya. Pembelajaran ini secara langsung dapat memberikan peserta didik mengembangkan konsep dan metodologi penyelesaian masalah.

Menurut Kunandar (2007), keunggulan penggunaan pembelajaran inquiri adalah memacu keinginan peserta didik untuk mengetahui, memotivasi mereka untuk melanjutkan pekerjaan sehingga mereka menemukan jawaban dan peserta didik belajar menemukan masalah secara mandiri dengan memiliki keterampilan berpikir kritis. Manfaat yang diperoleh bagi peserta didik dalam pembelajaran inquiri adalah peserta didik akan memahami konsep-konsep dasar dan ide-ide lebih baik, membantu dalam menggunakan daya ingat dan transfer pada situasi-situasi proses belajar yang baru dan mampu mengembangkan kemampuan berpikir kritis.

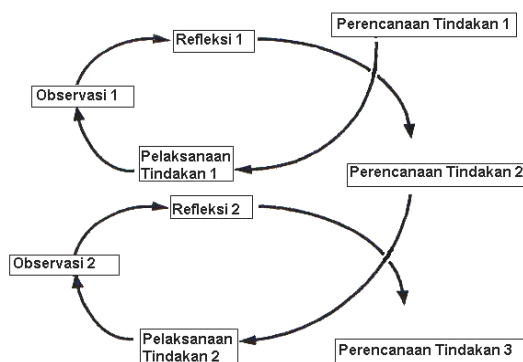
Dengan model pembelajara ini diharapkan peserta didik dapat meningkatkan kemampuan berpikir kritis dari rendah menjadi tinggi dan hasil belajar menjadi meningkat. Pemilihan penerapan model pembelajaran inquiri berbasis *lesson study* merupakan salah satu sarana bagi dosen untuk meningkatkan profesionalismenya dalam kegiatan pembelajaran. Melalui kegiatan *lesson study* yang terdiri atas tiga tahap yaitu *plan*, *do* dan *see*, dosen dapat meningkatkan pembelajaran secara sistematis, serta dapat membangun pengetahuan pedagogis.

Menurut Syamsuri & Ibrohim (2011) beberapa manfaat *LS* yakni 1) Meningkatkan keprofesionalan pendidik, sebab dengan *LS* melakukan pengkajian kurikulum, merumuskan tujuan pembelajaran, menentukan metode pembelajaran yang sesuai, dan menentukan media. Selain itu juga melakukan pengkajian terhadap proses pembelajaran dan pencapaian tujuan pembelajaran, serta menganalisis dan melakukan refleksi. 2) Meningkatkan mutu pembelajaran di kelas karena pendidik meningkatkan *LS* berdasarkan "sharing" dan berkolaborasi dengan pendidik lain, melakukan penelitian dengan mengkaji pembelajaran, mendasarkan pada kelas nyata, dan memfokuskan pada belajar peserta didik.

2. METODE PENELITIAN

Pendekatan yang digunakan dalam penelitian ini adalah pendekatan kualitatif. Pendekatan kualitatif dipilih untuk mendapatkan gambaran-gambaran mengenai tingkah laku subjek penelitian selama proses pembelajaran dengan pemberian suatu tindakan (Moleong, 2004). Jenis penelitian ini merupakan Penelitian Tindakan Kelas (PTK) atau *class action research* berbasis *Lesson Study*. Pada penelitian ini di masing-masing pertemuan baik untuk siklus I maupun siklus II dilaksanakan dengan *Lesson Study* (LS) yaitu memenuhi 3 tahapan *Plan*, *Do*, dan *See*.

Menurut Susilo (2013), kombinasi PTK dan *LS* sebagai sarana untuk mengembangkan keprofesionalan pendidik karena melalui PTK pendidik dapat memecahkan masalah-masalah pembelajaran di kelas, sekaligus melalui *LS* pendidik dapat mengamati bagaimana peserta didik belajar. Penelitian tindakan kelas berbasis *Lesson Study* ini dilakukan melalui kolaborasi antara peneliti dan dosen. Peneliti terlibat langsung dalam merencanakan tindakan, melakukan tindakan, observasi dan refleksi. Peneliti menggunakan 2 siklus, tiap siklus terdiri dari 4 tahap yaitu: perencanaan tindakan, pelaksanaan tindakan, observasi dan refleksi.



Gambar 2.1. Spiral Penelitian Tindakan Kelas (Muslih, 2010).



Gambar 2.2. Siklus Pengkajian Pembelajaran dalam *Lesson Study* di Indonesia (Sumber: Susilo 2013)

Instrumen yang digunakan dalam penelitian ini adalah rencana pelaksanaan pembelajaran (RPP), lembar observasi, catatan lapangan, tes kemampuan berfikir kritis dan hasil belajar diukur melalui tes yaitu tes akhir siklus I dan II. Analisis data dilakukan setiap siklus pembelajaran berakhir. Data yang diperoleh dianalisis sebagai berikut. 1) Tahap pertama, mengelompokkan data yang terkumpul dari berbagai instrumen sesuai dengan jenisnya, 2) Tahap kedua, menyajikan data secara deskriptif kualitatif, 3) Tahap ketiga adalah inferensi, yaitu menyajikan data dalam bentuk tabel atau diagram, 4) Tahap keempat adalah penarikan kesimpulan secara induktif, yaitu menafsirkan data yang sudah dikelompokkan.

Data hasil belajar dari skor tes akhir siklus dan data yang berasal dari proses kemampuan berfikir kritis mahasiswa merupakan data kuantitatif, sehingga teknik analisis datanya adalah sebagai berikut. 1) Kemampuan Berfikir Kritis; data kemampuan berpikir kritis dianalisis untuk mengetahui sejauh mana kemampuan berpikir kritis mahasiswa. Caranya dengan menganalisis penilaian, dilakukan dengan rubrik.

Penilaian rubrik mempunyai rentangan antara 1 untuk skor terendah dan 4 untuk skor tertinggi dalam setiap penjabaran indikator. Langkah selanjutnya yaitu mengelompokkan skor ke dalam kategori kemampuan berpikir kritis sesuai dengan penilaian rubrik. Hasilnya kemudian dianalisis pada kategori mana yang paling banyak muncul pada setiap siklus. 2) Hasil Belajar; data hasil belajar yang diperoleh siswa dibandingkan dengan nilai standar ketuntasan minimal (SKM) yang berlaku di prodi pendidikan biologi UMM yaitu dengan nilai minimal mencapai 55,0-59,9 dengan nilai huruf (C) sehingga mahasiswa dapat dikatakan tuntas apabila memperoleh nilai $\geq 55,0-59,9$. Selanjutnya seluruh mahasiswa dinyatakan telah tuntas belajar secara klasikal apabila ketuntasan belajar mencapai 75% dari jumlah siswa yang terdapat pada kelas tersebut. Ketuntasan belajar klasikal dapat diketahui dengan menggunakan rumus sebagai berikut.

Ketuntasan Belajar Klasikal =

$$\frac{\text{jumlah siswa yang memperoleh nilai } \geq 55,0-59,9}{\text{jumlah total mahasiswa}} \times 100\%$$

3. HASIL DAN PEMBAHASAN

Keterlaksanaan Tindakan pada Siklus I Kemampuan Berpikir Kritis

Analisis dilakukan dengan menghitung skor masing-masing aspek yang diperoleh mahasiswa, kemudian digunakan untuk melihat skor setiap aspek yang diperoleh mahasiswa, kemudian digunakan untuk melihat persentase skor setiap aspek kemampuan berpikir kritis mahasiswa secara klasikal. Setelah menghitung persentase skor kemampuan berpikir kritis tersebut selanjutnya mengklasifikasikan skor tersebut ke dalam kategori: kurang sekali, kurang, cukup, baik dan baik sekali. Pada akhir perhitungan, diperoleh klasifikasi nilai secara klasikal untuk mengetahui kemampuan berpikir kritis mahasiswa secara keseluruhan. Data hasil kemampuan berpikir kritis mahasiswa pada Siklus I dapat dilihat pada Tabel 2

Tabel 2.1 Data Kemampuan Berpikir Kritis Mahasiswa pada Siklus I

Indikator Kemmpaun Berpikir kritis	Skor (%)	Kriteria
I1	54	Kurang
I2	55	Kurang
I3	58	Kurang
I4	55	Kurang
I5	46	Kurang

Keterangan:

- I1 : Mendefinisikan masalah utama
- I2 : Pemahaman tetang kedalaman dan keluasan masalah
- I3: Sikap terhadap sudut pandang yang berbeda
- I4 : Identifikasi konsep
- I5 :Merumuskan alternatif pemecahan masalah

Hasil Belajar Mahasiswa Siklus I

Hasil belajar diperoleh melalui rerata Pengukuran hasil belajar siswa berdasarkan gabungan *pre-test*, *post-test*, nilai desain proyek, nilai produk, yang dilaksanakan pada Siklus I. Hasil belajar individu digunakan untuk mengetahui jumlah mahasiswa yang tuntas belajar. Jumlah mahasiswa yang tuntas belajar tersebut digunakan untuk menentukan hasil belajar secara klasikal. Adapun hasil belajar mahasiswa Siklus I dapat dilihat pada Tabel 3.

Tabel 2.2. Hasil Belajar Mahasiswa Siklus I

Ketuntasan Belajar	Jumlah Mahasiswa	Jumlah Mahasiswa Keseluruhan	Persentase ketuntasan
Tuntas belajar	37	37	100 %
Tidak tuntas belajar	0	37	0 %

Keterlaksanaan Tindakan pada Siklus II Kemampuan Berpikir Kritis

Tabel 2.3. Data Kemampuan Berpikir Kritis Mahasiswa pada Siklus II

Indikator Kemmpaun Berpikir kritis	Skor (%)	Kriteria
I1	64	Sedang
I2	65	Sedang
I3	68	Sedang
I4	66	Sedang
I5	57	Kurang

Keterangan:

- I1 : Mendefinisikan masalah utama
- I2 : Pemahaman tetang kedalaman dan keluasan masalah
- I3: Sikap terhadap sudut pandang yang berbeda
- I4 : Identifikasi konsep
- I5 :Merumuskan alternatif pemecahan masalah

Kemampuan berpikir kritis mahasiswa relatif rendah. Hal ini ditunjukkan dengan rerata persentase untuk indikator mendefinisikan masalah utama 64% (kategori sedang), pemahaman tetang kedalaman dan keluasan masalah 65% (kategori sedang), sikap terhadap sudut pandang yang berbeda 68% (kategori sedang), Identifikasi konsep 66% (kategori sedang), dan merumuskan alternatif pemecahan masalah 57% (kategori kurang). Kelima aspek atau indikator kemampuan berpikir kritis meningkat dikategori sedang atau mencapai kategori Cukup.

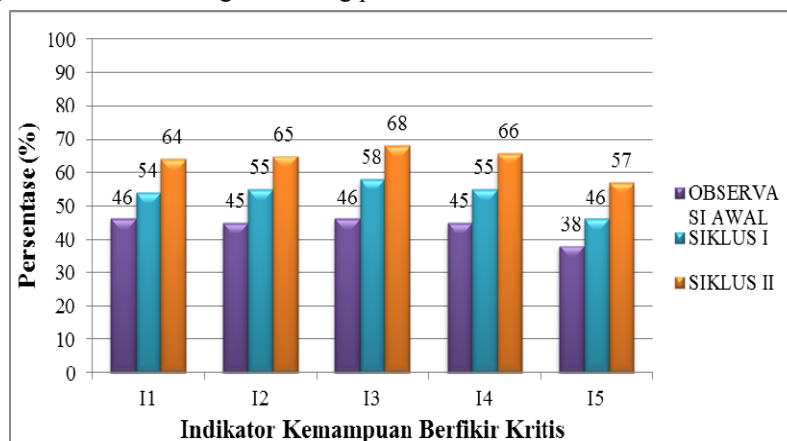
Hasil Belajar Mahasiswa Siklus II

Tabel 2.4. Hasil Belajar Mahasiswa Siklus II

Ketuntasan Belajar	Jumlah Mahasiswa	Jumlah Mahasiswa Keseluruhan	Persentase ketuntasan
Tuntas belajar	37	37	100 %
Tidak tuntas belajar	0	37	0 %

Berdasarkan Tabel 2.4 dapat diketahui bahwa hasil belajar mahasiswa pada Siklus I jumlah siswa yang tuntas belajar sebanyak 18 mahasiswa, sedangkan siswa yang tidak tuntas belajar sebanyak 19 mahasiswa. Persentase ketuntasan belajar mahasiswa secara klasikal sebesar 49%. Berdasarkan persentase secara klasikal ini diketahui bahwa hasil belajar sudah dapat dikatakan tuntas karena telah memenuhi standar KKM. Namun demikian, karena masih ada mahasiswa yang belum tuntas lebih dari jumlah keseluruhan mahasiswa maka tentu hal ini harus menjadi perhatian dosen model.

Kemampuan berpikir mahasiswa mengalami peningkatan pada Siklus I dan Siklus II. Untuk lebih memudahkan dalam melihat peningkatan komponen atau aspek kemampuan berpikir setiap siklusnya maka dapat digambarkan dalam diagram batang pada Gambar 3.1.



Gambar 3.1. Peningkatan Persentase Kemampuan Berpikir Kritis Mahasiswa Per-Siklus

Gambar 3.1. dapat dikatakan bahwa semua aspek kemampuan berpikir kritis mengalami peningkatan dan walaupun masih memenuhi kriteria cukup atau sedang pada setiap siklus. Hal ini berarti bahwa penerapan pembelajaran Inquiri dapat meningkatkan kemampuan berpikir kritis mahasiswa Pendidikan Biologi Universitas Muhammadiyah Malang.

Ketika seseorang memutuskan suatu masalah, memecahkan masalah, ataupun memahami sesuatu, maka orang tersebut melakukan aktifitas berpikir. Hasil penelitian Sohibin dkk (2009) mengungkapkan bahwa model pembelajaran inkuiri dapat meningkatkan pemahaman konsep siswa dan menumbuhkan kembangkan ketrampilan berpikir kritis.

Pengembangan keterampilan berpikir kritis idealnya tidak diperlakukan sebagai kegiatan yang berdiri sendiri. Kejadiannya harus terintegrasi pada peningkatan pengetahuan dan menerapkan ilmu pengetahuan. Diintegrasikan pada kegiatan belajar sehari-hari. Menurut Oak (2009) keterampilan berpikir kritis dapat dikembangkan melalui pengolahan kebiasaan berpikir analisis dan berpikir stratejik. Kemampuan itu ditingkatkan dengan membangun kebiasaan untuk menganalisis situasi yang kritis. Mengembangkan kemampuan memecahkan masalah dan mengembangkan keterampilan berargumentasi sejak usia dini merupakan strategi yang unggul dalam meningkatkan keterampilan berpikir kritis.

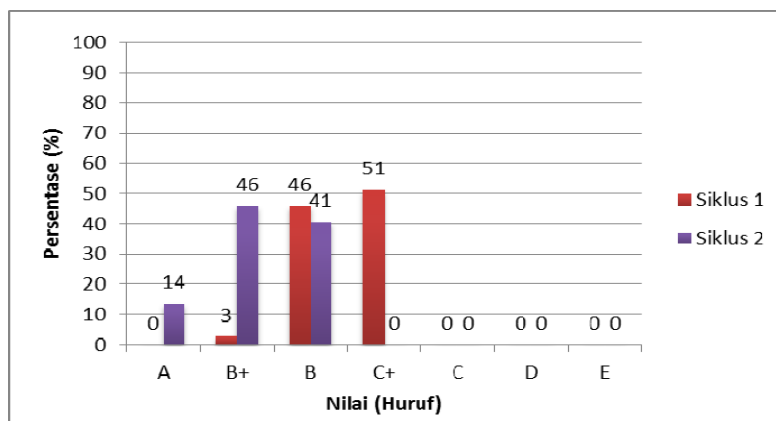
Inquiri dapat mengembangkan kemampuan berpikir kritis, melalui belajar kolaboratif peserta didik saling belajar yang nantinya akan meningkatkan penguasaan konseptual maupun kecakapan teknikal, holistik dan interdisipliner, realistik, berorientasi pada belajar aktif memecahkan masalah riil, yang memberi kontribusi pada pengembangan kecakapan pemecahan masalah dan memberikan *reinforcement* intrinsik (umpan balik internal) yang dapat menajamkan kemampuan berpikir kritis dengan indikator yang lebih detail diantaranya mendefinisikan masalah utama, pemahaman tentang kedalaman dan keluasan masalah, sikap terhadap sudut pandang yang berbeda, Identifikasi konsep, dan merumuskan alternatif pemecahan masalah.

Sehubungan dengan itu penelitian Halimah (2012), menjelaskan bahwa model inkuiri berbasis lesson study melatih peserta didik menemukan konsep atau jawaban suatu masalah yang menjadikan siswa lebih antusias dan mendorong siswa untuk mencari jawaban melalui pengamatan langsung sehingga dapat meningkatkan motivasi dan hasil belajar.

Faktor yang mempengaruhi peningkatan tiap siklus adalah kualitas pembelajaran yang semakin baik. Proses pembelajaran pada tahap siklus II lebih baik dibandingkan siklus I, sedangkan pembelajaran

siklus I lebih baik dibandingkan pra-siklus. Peningkatan kualitas dan keterlaksanaan proses pembelajaran mengakibatkan ketercapaian skor tiap aspek menjadi lebih tinggi. Kualitas pembelajaran dikelola oleh dosen

Berdasarkan data hasil analisis dapat dikatakan bahwa hasil belajar mahasiswa mengalami peningkatan jika kita membandingkan Siklus I dan Siklus II. Untuk lebih memudahkan dalam melihat peningkatan hasil belajar mahasiswa setiap siklusnya maka dapat digambarkan dalam diagram batang pada Gambar 3.2.



Gambar 3.2. Peningkatan Persentase Hasil Belajar Mahasiswa Per-Siklus

Gambar 3.2. dapat dikatakan bahwa semua mahasiswa mengalami ketuntasan belajar. Hal ini berarti bahwa penerapan pembelajaran Inquiri dapat meningkatkan hasil belajar mahasiswa Universitas Muhammadiyah Malang.

Susanto (2014) mengemukakan bahwa hasil belajar merupakan tingkat pencapaian siswa setelah melakukan kegiatan belajar sesuai dengan tujuan yang telah ditentukan. Sejalan dengan hal itu, hasil belajar mahasiswa ditunjukkan dengan kemampuan kognitif melalui pretest dan postest sedangkan kemampuan berpikir kritis mahasiswa yang diukur melalui rubrik kemampuan berfikir kritis. Evaluasi yang dibuat oleh peneliti sesuai dengan materi yang sedang dibahas dan mengandung indikator-indikator dari kemampuan berpikir kritis yang telah ditentukan sebelumnya.

Strategi dan pelaksanaan dalam pembelajaran terkadang tidak sesuai dengan apa yang diharapkan, jika hasil berbeda perlu refleksi sebagai bahan acuan untuk tindakan selanjutnya. Dosen melakukan perbaikan pembelajaran pada tiap siklus melalui tahap refleksi dan perencanaan kembali sebagai upaya perbaikan di siklus berikutnya. Semakin baik kualitas pembelajaran yang dikelola oleh dosen di kelas, semakin besar peningkatan kualitas mahasiswa. Hasil penelitian ini mendukung hasil penelitian sebelumnya yang dilakukan oleh Deur & Harvey (2005), Setiawan (2005), Rapi (2008), dan Hermawati, (2012), yang menyatakan bahwa strategi pembelajaran inquiri memberikan dampak yang berbeda secara signifikan dengan pemahaman konsep dan hasil belajar siswa. Belajar dengan menerapkan pembelajaran inquiri memberikan nilai yang lebih baik pada tingkat kognitif dan afektif siswa (Balim, 2009).

4. KESIMPULAN

Penerapan Model Pembelajaran Inquiri Berbasis *Lesson Study* dapat Meningkatkan Kemampuan Berfikir Kritis dan Hasil Belajar Mahasiswa Pendidikan Biologi Universitas Muhammadiyah Malang.

Perlu penelitian lebih lanjut terutama untuk melihat kemampuan berpikir kritis berdasarkan pengamatan langsung atau berdasarkan aktivitas yang dilakukan mahasiswa selama proses pembelajaran (tidak hanya menggunakan rubrik yang diisi sendiri oleh dosen atau observer) alternatif menggunakan soal esay yang disesuaikan dengan indikator pencapaian pembelajaran yang telah ditentukan atau angket yang juga diisi oleh mahasiswa sehingga data lebih berimbang atau valid. Untuk mengurangi mahasiswa yang bekerja sama pada waktu *pre-test* dan *post-test*, perlu adanya penambahan observer yang bertugas sebagai pengawas pada waktu kegiatan *pre-test* dan *post-test* sehingga hasil yang diperoleh lebih baik.

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Lesson Study for Learning Community to Improve the Teaching Quality of Biology Teachers

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Abstract: The aims of this study is to increase the teaching quality of Biology Teacher through Lesson Study for Learning Community (LSLC). The research was conducted at SMA Negeri (State Senior High School) 16 Semarang, Central Java, Indonesia, of the second semester in academic year 2015/2016. The subjects were teachers of class XI.1 of SMA Negeri 16 Semarang. LSLC in this study involves some teachers such as Biology, Bahasa Indonesia, English, Sociology, and also prospective Biology students teachers. The instructional media is video to learn about exploration of mangrove ecosystems. This research method used classroom action research design with cycles and combined with LSLC. The results showed that quality of the teaching increase at the preliminary activities, core activities, application of learning strategies that educate, engage student in learning, as well as time management conducted by Biology Teacher. The conclusion is that Lesson Study for Learning Community can improve the teaching quality of Biology Teacher in SMA Negeri 16 Semarang.

Keywords: *LSLC, Teaching Quality, Biology Teacher*

1. INTRODUCTION

Learning process is the focus in education, with teachers as well as planners and implementers of the learning process. The influence of teachers on educational success is huge. Learning process is very influential in enhancing the analytical skills of learners, therefore, teachers are required to develop and improve the quality of learning. In addition, teachers have a strategic function in the development of education, particularly to educate graduates who are becoming professionals as mandated by Law No.14 of 2015 on Teachers and Lecturers. Moreover, in the era of globalization, teachers who have innovative thoughts and act effectively in improving the quality of the course and learners' development is urgently needed. In performing their professionalism duties as educators, teachers earn the obligation to perform basic activities in accordance with Permendikbud no.22 of 2016 which is about the standard process of primary and secondary education in the implementation and control of the learning process. The goal of the mandate of Law and Permendikbud can be achieved when teachers can improve the professionalism. One of the efforts for the achievement can be done with the *Lesson Study*.

Professionalism of teachers should always be improved, because the increased professionalism of teachers will be followed by an increase in the effectiveness of teaching and learning. Indirectly the improvement in teachers' professionalism will also have the impact on improving the quality of education in general. Lesson Study is a method, used by the Japanese educational system for over a century, of observing students' learning. (Bogner, 2007).

SMA N 16 Semarang is one of the schools that have implemented Lesson Study. However, based on interviews with biology teachers of this school, there are still some shortcomings so that the implementation is not maximized. One class in this school, named XI.1 IPA needs to improve the quality of learning. This will need the cooperation among educators in improving the quality of learning. This activity can be packed into a study of sustainable and collaborative learning based on the principle of collegiality, known as Lesson Study.

The implementation of Lesson study is not exactly easy, especially in maintaining the intensity and frequency of the implementation. Therefore it is necessary for a renewal and reformation in the implementation of Lesson Study, and one of them is by the application of Lesson Study which is oriented on Learning Community (LSLC). Learning community can be interpreted as a learning community, where not only students who learn collaboratively, but also educators collaborate together to

improve the quality of learning, collegiality and professionalism. It is not only a collaboration of science teachers as well as across discipline, stakeholders, and parental and community participation (Sato, 2012). Based on the results of Short Term Training on Lesson Study Batch V organized by Ristekdikti and JICA (Japan International Cooperation Agency), followed by the author during one month in Japan in 2015, it is known that Lesson Study for Learning Community (LSLC) is the latest Lesson Study. Therefore, it is necessary to conduct a LSLC research in Indonesia to overcome the problems of learning which has not been maximized yet. With the community's learning, it is hoped that the lesson study activities is expected to run continuously and strengthen the cooperation and collegiality among teachers and other academic circles in an effort to improve the quality of teaching and learning achievements of learners in secondary education environment indirectly.

The teachers' success in developing teaching skill mostly depends on the involvement and active participation of students supported by instructional media. The teachers' efforts to improve students' learning should make the learning activities more fun and interesting with the help of media and learning resources accordingly. The best learning resources to learn the material on ecosystem is the ecosystems in the surrounding area. So far in the process of ecosystem learning students of SMAN 16 Semarang has never been taken to mangrove exploration. Although the mangrove areas is on the reachable location from the school, but if it is carried out during the hours of learning in school then the time is not sufficient. So there needs to be an appropriate medium for learning material by using video of mangrove ecosystem exploration.

Based on the above background, the purpose of this research is to improve the quality of teaching through video exploration by a Biology teacher through Lesson Study for Learning Community.

2. RESEARCH METHOD

The research was conducted in SMAN 16 Semarang. The research was conducted in the second semester of the academic year 2015/2016. The research sample was class XI.1 Science of SMA N 16 consisting 33 students. This study is a mixed method design-a combination of Action Research Classroom and Lesson Study activities for Learning Community (LSLC).

This research was conducted in two cycles of Action Research. Each cycle consisted of four steps (Kemmis and Mc Taggart, 1988), namely (a) planning, an activity to formulate the problem, define goals and methods of research, as well as an action plan, (b) action, which is performed as a planning exercise, (c) observations, carried out systematically to observe the results or impact of the action on the learning process, and (d) the reflection that is reviewing and considering the outcome or impact of the action taken. Those action research activities then were combined with components of lesson study (plan, do and see). The stage plan was integrated into the planning activities of Action Research Classroom, do was mixed in action and observation activities, and see in the reflection stage. All these activities were done collaboratively with the involvement of observer in various fields as a learning community. Media used in this study was the video of mangrove exploration and the learning model used was Discovery Learning. The instrument used in this study was the teacher competence observation sheets and documentation. The indicator of the success of this study was if there was an increase in learning achievement of very good category.

3. FINDING AND DISCUSSION

The fourth stage in this Action Research combined with the stage of LSLC thus forming one complete cycle. This research was conducted in two cycles, while the activities in each cycle were described as follows:

a. First cycle

The first cycle of classroom action research activities was done on material analysis of learning strategies implemented for three meetings. At each meeting, LSLC activities (plan, do, see) were applied on a

regular basis until the end of the cycle, so that within one cycle of action research, there were three times of LSLC activities. Elaboration of the stages of research in the first cycle was described as follows.

1) Planning Actions

Activities in this preparatory stage are to prepare everything related to the research. Action planning is done collaboratively in groups integrated in the activities plan of lesson study. In the plan activity the teaching team and the researchers discussed the form of biology teaching and learning implementation plan (lesson plan) using instructional mangrove video, then grouping students in which each group has a heterogeneous academic ability, learning strategies, and evaluation.

2) Implementation of the action

The implementation phase of the actions was carried out in accordance with a program that had been developed in the lesson plan. Teachers deliver material of the ecosystem components and the relationship of biotic and abiotic components through mangrove exploration video and ask the students to observe. Students discuss in small groups and noted the result of their discussion using Student Discussion Sheet. The teacher became a facilitator in the implementation of the classical discussion to communicate the results of group discussions.

3) Observation

Observations were made during the implementation of the learning process. It was done by recording of all of the activities conducted by observers from various disciplines namely biology teacher, Indonesian teacher, English teacher, and the Sociology teacher as a learning community. The instruments used were sheets of observation and documentation.

The results of the observations showed that the implementation of learning by biology teachers in the first cycle is as follows.

Tabel 1. Learning Implementation of the First Learning Cycle

No	Aspect	Value	Category
1	Implementation of preliminary activities (apersepsi and motivation)	75	Good
2	Describing competence and action plans	70	Enough
3	Mastery of the subject matter	80	Good
4	The application of educative learning strategies	74	Good
5	The application of scientific approach	80	Good
6	Use of learning resources/media in learning	78	Good
7	Involving learners in learning	80	Good
8	Implementation closing activities	77	Good
Total		614	Good

4)Reflection

The results of the implementation of the first action showed that the learning process reflected together in order to obtain information about the advantages and disadvantages in the first cycle. All of the learning problems were recorded during the observation and documentation. This record is used to find a solution through discussions. The results of the first cycle reflection were related to the implementation of preliminary activities, and time management. Since the discussions lasted long enough and the seating arrangement so that female students so tend to discuss with female students, as well as in boys. Additionally students' presentations are ineffective and the video media has no voice narration. The results for further reflection is used as a guideline and other considerations in Planning Implementation Cycle II.

b. Second cycle

In the second cycle, the result of the reflection at the first cycle stages was included in second cycle of planning stage. The findings obtained in the first cycle were then discussed and corrective measures were sought so that the actions in the second cycle will be more effective. The material for the second cycle was the application of learning strategies. The stages in the second cycle are as follows.

1) Planning actions

Activities undertaken in the preparatory stage is to prepare the seating chart with intersecting positions between male and female, students' presentation strategies that make more optimal learning time management, and in its evaluation, jumping tasks were also planned to develop students' higher order thinking skills. Besides the video was improved by adding voice narration and written captions to clarify information in the video.

2) Implementation of the action

The implementation phase of the actions was carried out in accordance with the lesson plan that had been developed. The teachers deliver material about imbalance in relationships between components due to natural and man-made nature. Discussions with LDS students ended with a parallel presentation and continued to the classical questioning. In this case, the learning process implemented the scientific approach, in which the teacher acts as a transmitter of information, facilitators and tutors. Atmosphere of learning was fun and made the students engaged in learning and enjoying the lessons. At the end of learning, students were given the jumping task in the form of questions of higher critical thinking.

3) Observation

Observations on the second cycle were carried out also by observers from various fields of science as a community. In addition to recording the implementation of learning, observers also wrote the positives and negatives of the learning process that they observed on a sticky note paper of different color. The results of each observer remarks were documented as supporting material on reflection based on AR and LSLC. Based on the results of the observations, it showed that the enforceability of learning by biology teachers in the second cycle is as follows.

Tabel 2. Learning Implementation of the Second Learning Cycle

No	Aspect	Value	Category
1	Implementation of preliminary activities (apersepsi and motivation)	80	Good
2	Describing competence and action plans	88	Very good
3	Mastery of the subject matter	90	Very good
4	The application of educative learning strategies	80	Good
5	The application of scientific approach	85	Good
6	The use of learning resources /media in learning	82	Very good
7	Involving learners in learning	85	Very good
8	Implementation closing activities	80	Good
Total		670	Very good

4) Reflection

The observation on the implementation of second action to the learning process and the student learning outcomes were reflected together in order to obtain information about the advantages and disadvantages in the second cycle. Learning activities by using video mangrove exploration gave teachers the opportunity to apply a contextual learning so it is more easily understood by students. The concept is supported by the results of research conducted by Taufik et al. (2014) which states that the development of integrated science teaching media characterized by caring the environment on the theme of

conservation with the media improve learning outcomes. Learning was carried out with the design of the U-shaped seating area as well as the position of men and women intersect group discussion makes the discussion became more run collaboratively. Teachers in implementing the scientific approach have become a transmitter of information, the facilitator, as well as excellent mentors when students learned in small-group discussions and mutual listening classical discussion. Based on the observations it can be seen that the indicator of the success of this reseach was achieved very good category and there was an increase from the first cycle to the second cycle as much as 10.89%. This represents an increase teaching quality.

Collaborative learning that develop collaboration skills among students provide significant contribution to help students who have difficulty in understanding the concepts of learning and solving problems of jumping task and finding a solution that balances the relationship between the components due to natural and man-made factors.

The success of Lesson Study is the achievement of a collaborative process of the Learning Community that has a common interest to learn from each other in improving the quality of learning

This is in line with Lee (2008) that stated the benefits of lesson study one of which is to develop the professionalism, the implementation process of lesson study integrates a number of strategies professional development, including in the form of the pedagogical ability, collaborations, peers observation, group conferences, self-reflection as well as a heightened awareness on the needs and difficulties faced by students. Educators need to think carefully about the object of learning, critical components, questions, activities and approaches that can be used. Educators will also get reciprocal of how teaching has been done and the new ideas of activities see or observe learning activities carried out by colleagues / study lesson team.

Sato (2012) stated that Lesson Study can realize the right of children's learning guarantee the development of teachers as educational experts, build a trust of many parents in the area, so there are no teachers, students, and parents who oppose the vision of a learning community.

Learning community appears based on the vision and mission emphasis on ensuring the rights of each child's learning without exception and improves the quality of teaching as well as the achievement of simultaneous between quality and equity in learning. These activities can be pursued through the implementation of three systems of activities, including collaborative learning is in the classroom, the formation of a professional learning community, and collegiality in the teachers' rooms, as well as parents' participation and the community. The third system is a system of activities that concretely realize the vision and mission of education to become the important tools to build learning communities (Sato, 2012)

In the system of these activities, both in the introduction of collaborative learning students in the classroom and the formation of learning communities of teachers (collegiality) in lesson study, students and teachers pursue learning of high quality, and the system this activity is a means to be able to understand the philosophy of the public, democracy and superiority.

Lesson Study oriented in Learning Community or commonly abbreviated to LSLC give teachers the opportunity to revisit the reactions taken reflexively as skill when they saw student learning or confusion among students in learning. LSLC simply not focused on how to teach the teachers, but also pay attention to the students how they learn in class and what the rationale in a real situation is, and discuss how teachers can help students so that student learning was more qualified (Sato, 2012). LSLC has two characteristics; the first is that this event is an opportunity for teachers to obtain knowledge about the subject matter. Thus it can be recommended to all teachers can open a class (do open class) at least once per year. The second is that the event is an LS cross subjects or fields of study, therefore it needs some discrepancy with the LS-based subjects such as during this time, so it will expand the horizons of teachers in teaching and improving the quality of teaching.

4. CONCLUSION

Based on the findings, it can be concluded that Lesson Study through Learning Community in learning Biology with video media of mangroves exploration can improve the quality of learning in SMA N 16 Semarang.

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**THE IMPLEMENTATION OF PROBLEM BASED LEARNING (PBL) MODELS COMBINED
PROJECT BASED LEARNING (PjBL) MODELS THROUGH LESSON STUDY TO
DEVELOP ANALIZED LEARNING ISSUES SKILLS AND SCIENTIFIC
APPROACH LESSON DESIGN**

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Abstract: The implementation of 2013's curriculum in science learning is a challenge for educators to be able to create effective learning, innovative, efficient, and meaningful to learners. Based on the 2013 curriculum, learning science level SMP / MTs should be conducted scientifically and integrated (using a scientific approach). Therefore compiled research that aims to develop students' skills in analyzing prospective science teacher learning situation and draft the appropriate learning science curriculum, 2013. This study is a qualitative descriptive study carried out by applying the learning (lesson study) in two cycles, each cycle consists of two meetings. First's cycle using problem-based learning (PBL) models and second cycle using project based learning models (BjBL). The subjects were students of preservice science teacher education courses UM Science Faculty in 2013 with 54 students. The results of the first cycle of learning shows that preservice teachers IPA is able to analyze the situation in a comprehensive learning in school and be able to formulate a plan of practical problem solving. Learning outcomes of the second cycle showed that preservice science teachers were able to drafting science lesson design using scientific approach and integrated. The mean value of the skills of preservice science teachers in analyzing the situation are 82.3 and 80,4 drafting science lesson design according to the curriculum in 2013. Based on research, the application of PBL learning model combined PjBL-based lesson study is able to develop the skills of preservice science teachers in analyzing the situation and drafting science lesson design according to the curriculum in 2013.

Keyword: *problem based learning (PBL), project based learning (PjBL), Science learning, lesson study, science lesson design*

1. INTRODUCTION

Education is a conscious and deliberate effort to create an atmosphere of learning and the learning process so that learners are actively developing the potential for him to have the spiritual power of religion, self-control, personality, intelligence, character, skills needed him, society, nation and state (Act no. 20, 2003). The curriculum is a set of educational plan developed dynamically in accordance with the demands and changes taking place in society. Curriculum in Indonesia several times through the turn, however all of the national curriculum designed by the same basis, namely Pancasila and the Constitution of 1945. The difference between the principal emphasis lies in the curriculum of educational objectives and approaches in realizing it.

Beauchamp (1975: 164) means that the implementation of the curriculum is a process that puts the curriculum as a reference in acting / doing something. The curriculum is used as a reference in designing, implementing, and evaluating learning. All lesson activities should be based on the curriculum. Seller and Miller (1985: 246) defines the implementation of the curriculum as a process that practice ideas, a program or a series of new activities to individuals or organizations. Based on these two opinions, the implementation of the curriculum is an activity that aims to achieve or implement the curriculum in the form of real class, namely the process of transmission and transformation of the learning experience to students. Learning is the main reference in the curriculum.

Curriculum 2013 is a competency-based curriculum that once initiated the pilot Competency Based Curriculum (CBC) in 2004, but has not been resolved because of the pressure to immediately implement the Education Unit Level Curriculum (SBC) in 2006. Structuring the curriculum to the curriculum in 2013 performed as a trustee of the Law no. 20 of 2003 on national education, and a

presidential decree no. 5 of 2010 on the national medium-term development plan. The curriculum was developed in 2013 to improve education outcomes in terms of improving the effectiveness of learning in the educational unit and additional learning time in school. Orientation curriculum in 2013 is the increase in the balance between competence attitudes, skills and knowledge.

Curriculum 2013 set of competency standards, content standards, standardized processes, and assessment standards; which will be a reference in implementing the curriculum of 2013. The emphasis in the curriculum in 2013 that the modern pedagogic dimension in learning, using a scientific approach (scientific approach). Characteristics of the learning process adapted to the characteristics of competence. Integrated thematic learning in SMP / MTs adjusted to the level of development of learners. Learning process in SMP / MTs adapted to the characteristics of competence begin to introduce subjects with maintaining the thematic integrated IPA (Permendikbud no. 22, 2013).

Specific competencies set out in the NSTA Science teacher (2003: 1) which recommended Standards for Science Teacher Preparation. This standard contains a number of standards that must be owned by a science teacher standard includes content, nature of science, inquiry, Issues, general skill of teaching, curriculum, science in the community, assessment, safety and welfare, professional growth. This standard is consistent with the vision of NSES (National Science Education Standards). NSTA (2003: 8) states that the science teachers of primary and secondary schools should have the capability of interdisciplinary science. This is the underlying need for an integrated mastery of materials science for science teachers.

Learning plan is designed in the form of syllabus and lesson plan (RPP), which refers to the content standards. Learning plan includes the preparation of lesson plan and preparation of media and learning resources, assessment tools of learning, and learning scenarios. Syllabus and lesson plans tailored to the learning approach used (Permendikbud no. 22, 2013).

Education courses IPA UM is one institution that will grant the prospective educator (teacher) level SMP / MTs in the field of science studies. An understanding of the planning, implementation, and assessment of learning scientific and integrated to streamline the achievement of knowledge, attitudes, and skills into the main condition for the achievement graduate student of IPA Education UM. Therefore, the implementation of the curriculum in 2013 in science learning is a challenge for prospective educators to be able to create effective learning, innovative, efficient and meaningful to learners.

2. RESEARCH METHODOLOGY

This research is a qualitative descriptive study carried out by applying the study of learning (lesson study) in two cycles. Each cycle consists of two face to face meetings. Learning first cycle using a model of problem-based learning (PBL) and learning a second cycle using project based learning models (PPA). The subjects were students of prospective science teacher education courses UM Science Faculty force in 2013 a number of 54 students.

Research was conducted on compulsory subjects presented by science education study programs are subject Integrated science teaching. This subject is packaged such that the expected learning outcomes of students who are able to design, implement and evaluate the level of learning science SMP / MTS. This course of teaching are team teaching by three lecturers, so that in practice there is always a collaboration between lecturers. Learning this course is done by using lesson study. This study was conducted in two cycles (two rounds), each round using different learning models.

The first learning cycle (using the model PBL), student teachers IPA faced with the problems of real learning science at school (junior level). Learning problems are analyzed and searched troubleshooting. The second learning cycle is done by applying the model PPA. Learning with the aim to produce a PPA project in the form of solution of the problems of learning that has been filed in the first cycle. Project generated in the form of design students learning science in accordance with the demands of the curriculum.

3. FINDING AND DISCUSSION

Based on the results of the first cycle of learning, obtained a mean value of the ability of student teachers learning science in analyzing issues of 82.3. Indicators for the assessment of this first cycle include, the sharpness of the background of the problems, the problems of learning science in school, formulation of the problem, and design solutions offered students to overcome these problems. Learning in the first cycle was conducted over two times the face and once observational learning in school. The first meeting to discuss the draft observations to be carried out to find the real problems learning in school. The second meeting is to discuss findings of science learning problems and discuss solutions that will be associated with these problems. Observation learning is done in junior high school Malang, with a total of as many as 12 students school science teacher candidates were able to find and analyze problems of sharply science learning.

The main problem of learning science at school were found by the students is the implementation of learning science can't be implemented in accordance with the demands of the curriculum. Based on the demands of the curriculum in 2013 learning science should be done with a scientific approach and integrated manner. Based on observations in the field show that schools that have implemented the curriculum in 2013 there are still many difficulties in the application of learning in the classroom especially science lesson.

According to analysis conducted student teachers UM Science Faculty cause of the implementation of science teaching is not in accordance with the curriculum in 2013 there are a number of factors. The first factor is the difficulty in designing learning science teacher in accordance with the demands of the curriculum. The second factor is the difficulty in combining materials science teacher. The third factor is the difficulty in assessing authenticity. Based on these problems, student teachers were asked to make a statement IPA resolution.

Formulation of problem solving (solution) made by student teachers IPA embodied in a project. The solution is designed as the design of learning science by using scientific and integrated approach that is capable of effecting the attainment of attitudes, skills and knowledge. Science student teachers to design learning in accordance with the demands of the curriculum of 2013. The mean value of the ability of students in designing learning is of 80.65. Indicators assessing learning design includes four aspects. The first indicator is the truth in selecting the essential concepts in KD (Basic Competence) which then is combined with the essential concept makes its integration diagram. The second indicator is coherence in formulating the indicators of learning, learning objectives, and assessment. A third indicator includes aspects of learning scenarios conformity with learning model created, the suitability of the learning activities with the characteristics of the material, and the suitability of the learning activities with scientific activities. The last indicator is the conformity assessment techniques with the purpose of learning.

Table 1. Percentage of Preservice Science Teacher in Developed Learning Design

Indikator	Percentage	Criteria
1	90,3%	Very high
2	88,9%	Very high
3	76,7%	high
4	73,1%	high
total	80,4%	high

Based on Table 1 it appears that the ability of student teachers design learning science in junior high school science curriculum in accordance with the criteria in 2013 were high (80.4%). The criteria used is based on a scale of criteria Riduwan (2007: 45).

The first cycle of learning activities with PBL models were applied using a study of lesson study. Tim lecturers always had preliminary discussions (plan) to design learning activities of students, then execution do observed by other lecturers and followed by reflection. Positive findings of the first study

was used as trigger the next learning. The weakness of the study is used as a learning lesson for improvement next, and so on.

Lesson study is a model of coaching (training) educator profession through assessments and ongoing collaborative learning based on the principles of collegiality and mutual learning to build a learning community. In addition Styler and Hiebert (Susilo et al, 2009: 3) says that Lesson study is a collaborative process to a group of teachers when identifying problems in learning, designing learning scenarios, implementing the learning according to the scenario (one of the teachers implement instructional while others observed), evaluate and revise the learning scenario, carry out more learning scenarios which have been revised, again evaluate learning and share the results with other teachers (dissemination). So that these activities will always be repeated in order to improve the quality of learning.

Learning in the second cycle using a model PPA. The main project is to design learning science students in accordance with the curriculum of 2013. Based on the curriculum in 2013, should be implemented in an integrated science and scientific. This is in accordance with the characteristics of IPA. IPA (Natural Sciences) is a way of thinking, how to investigate, unity of knowledge, and interactions with technology and society (Chiapetta, Eugene L. & Koballa, Thomas R, 2010: 105). This becomes the substance of the underlying importance of learning science who developed the scientific process for the formation of students' thinking. According to Sund & Trowbridge (1973: 2), the word science as a collection of knowledge and process to obtain it.

The development of the scientific process students need depends on the design of learning made by teachers. Instructional design and activities of teachers in the classroom to determine the success of their students learning. So the design of planned learning by teachers can have an impact on student learning outcomes (Brophy, Jere E., 2010). The expected learning outcomes of course holistic competency includes three aspects, namely knowledge, attitudes and skills. Three competencies that is the main curriculum of 2013. In order for student learning outcomes obtained more meaningful it is expected that the student is able to deliver back what they have earned. IPA concept needs to be conveyed from one person to another so that IPA is growing (Hedge & Mera, 2012).

The process of learning science can produce better learning outcomes for students if the content and the learning procedure is organized into a meaningful sequence, the material is presented in sections depending on the depth and difficulty (Kabba, 2009). Trafficked for the purpose of learning Lukan synthesis step. Synthesize is to link the topics of a field of study with the entire contents of a field of study, so that the contents presented more meaningful causes students to have a good memory and more durable of the topics being studied.

Learning PBL is a learning based on concrete issues around students. The problem studied is not just a problem of manipulative, but the real problem actually occurs in an area (Wood, 1994). In this study, the real issue presented is a matter of learning science SMP / MTs is apparent that happened at school. Science student teachers analyze the problem from the cause, until a solution is to be done by the students to overcome these problems. Learning to practice problem-solving skills should be embedded in all aspects of learning, so that learners are able to analyze it thoroughly and be ready to face problems in the future (Mabilangan, 2012).

The second cycle using model PPA. Model PPA is a learning model that refers to the contextual constructivism learning theory (Khamdi, 2007). This model emphasizes the formation of the products made by the students. The products are made is contextual applicable. In this study, the products produced in the form of science student teachers design learning science. Science student teachers were asked to produce a product that can be a solution of the contextual issues of the learning outcomes of the first cycle. Both learning model used in the study of continuous mutual. Some of the advantages of learning that uses PPA models, among others, increase motivation, improve problem-solving abilities, improve collaboration, and increase creativity (Moursund, 1997).

4. CONCLUSION

Based on research, the application of PBL learning model combined PPA-based lesson study is able to develop the skills of student teachers learning science in analyzing the situation and drafting a science learning according to the curriculum in 2013.

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Sharing and Jumping Task Based Lesson Design of Conservation of Mass Concept

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Abstract : This research aims to develop a lesson design in sharing and jumping task of conservation of mass concept. This lesson design based on learning obstacle of high school student and teacher's self-reflection. The method used in this research was qualitative research method. The research subjects were students of grade X and XI in one of high school in Bandung. The Instrument that used were a test, observation sheet, interview guideline, and documentation. Research findings indicate that the identified learning obstacles were students did not understand the meaning of conservation of mass and students have obstacle looking at the concept of mass, they thought in a chemical reaction mass of solid is greater than the liquid mass, and the mass of the gas is not considered. Student's learning obstacles were identified as a basis for designing the lesson design. This lesson design contained of sharing and jumping task activities. Lesson design was implemented twice. In the first implementation, there were still many teacher's involvements in the activities of sharing task and time management for jumping task activities was not arranged well. Lesson design that has been implemented in the first class then revised to be implemented in the second class. The revision lesson design was adding a chemical substance used in the lab practice activity. In the second implementation, students were more active in sharing and jumping task activities. It was because self-reflection of teachers to reduce teacher's involvement in student group activities. The results of the implementation of lesson design showed that reduced learning obstacle of high school student on the concept of conservation of mass.

Keyword: Lesson Design, Sharing and Jumping Task, Learning Obstacle, Conservation of Mass

1. INTRODUCTION

The Strategic Plan of the Ministry of Education and Culture 2015 - 2019 show that not sufficient good in term of learning quality in Indonesia, both measurement from the learning process and results of student learning. The government has sought many steps to improve the quality of teaching in Indonesia, one of them with the development of curriculum 2013. Minister of Education and Culture of the Republic of Indonesia Education (2014) explained that learning process on the curriculum in 2013 is using a scientific approach that touches three domains, they are: attitude, knowledge, and skills. With the learning process as it, is expected to produce students which are productive, creative, innovative, and affective through the strengthening of attitudes, skills and integrated knowledges.

In fact, the learning process is still a lot things that is not fit with the expected demands of the curriculum 2013. Baswedan (2015) said that from the various studies, the learning process in the classroom generally does not run interactively so it can not foster creativity, critical thinking, and analytical skills of students.

Correspondingly, based on the observations that have been done in one of high schools in the city of Bandung, the learning process was not run interactively. Teacher transfer knowledges by explaining and giving examples in class, and the students only listened, wrote, then did the exercises given by the teacher. Some students was losing focus in learning, it was identified because there was unreasonable attitudes or behaviors that are inappropriate in the learning process. For example, when a teacher was

explaining the material there was a student who fall asleep, some of the boys made a fuss in the classroom so the teacher had to move the seat of students to the floor in the front row so they were more focused to the teacher's explanation. There were student who the divided the focus of his eyes between drawing and paying attention to the teacher in front of the class during the learning process.

When the teachers gave assignments to students, there were some students who were very slow in understanding and working on the task, so the teacher had to guide the students personally in front of the class from the start until the end of the work. When teachers was guiding these students, other students returned no attention and showed behavior that does not reflect an interest in learning by doing other things outside of learning such as playing cell phones and chatting outside learning topics with friends.

A learning atmosphere like that will cause obstacles for students in understanding concepts in chemistry materials. One of the most fundamental chemistry concepts is the conservation of mass, but there is some studies that show learning obstacle that experienced by the students in understanding the concepts of conservation of mass.

Bachelard in Mortimer (1995) explains the existence of epistemology obstacles in respect of the concept of the mass. Mass is associated only to things that are big and heavy. So it is difficult to connect the mass with subtle substances such as air and other gases.

The results of research conducted by Ramsden (1997) also shows that conservation of mass is generally poorly understood. This is shown when students are given questions about mass conservation law in chemical precipitation reactions, half of the number of students gave wrong answers and did not give an explanation on the answers. There are some students who gave an explanation, but the explanation was wrong because it considers the sediment will be heavier, examples of student's answers as follows: (1) The sediment is a solid, and weighs more than the liquid. (2) The Solids that formed has a greater density than the liquid. So the weight of the solids will be slightly heavier than liquid. So the weight of the solids will be slightly heavier than liquid. One-third of the students who answered wrong, thought that mixing the two solution to make a sediment involving the formation of gas, which is leading to a decrease in mass. A small number of other students provided an explanation that involves evaporation such as: some liquid will evaporate but not too much.

Ozmen & Ayas (2003) conducted a study aimed at investigated the student's understanding of conservation of mass in a chemical reaction that occurs in open and closed systems. The findings showed that half the students from grade ten to understand the conservation of mass in a chemical reaction of the mass before the reaction is equal to the mass after reaction. Half of them have a misconception. Some students do not realize that the mass of the solution is equal to the mass of dissolved substances and solvents. Here are some of the opinions of the students most commonly found in this study: (1) solid is heavier than gas, (2) when the phosphorus soluble in water weighs disappeared, (3) the resulting sediment is heavier than liquid, (4) when a chemical combustion occurs in a closed system, the mass of the overall decline.

Learning obstacles on conservation of mass concept has to be overcome, because the law of conservation of mass is a very basic and fundamental law, and it is also associated with other chemistry materials such as chemical equations. One of the ways that can be done to overcome the learning obstacles is by constructing the lesson design. The lesson design was organized collaboratively in the development of materials, design framework, and the provision of learning resources with teachers or experts.

The purpose of this study is to develop a lesson design of conservation of mass corresponding to the identified learning obstacles and teacher self-reflection.

2. RESEARCH METHODOLOGY

Research methods used in this research is qualitative research methods. Research done in one high school in the city of Bandung. The subject in this study isthe students from class X and Class XI. Chemistry teacher, a teacher model, was the teacher who teach in the classroom that has been set as the

class of the subject, namely teachers collaborate with researchers as team teaching. The instruments used are a test (Tes Kemampuan Responden), interview guidelines and observation sheets.

3. FINDING AND DISCUSSION

Learning obstacle on the concept of conservation of mass is obtained based on the results of the analysis of the findings from the student's answers on test and the results of the interviews students. The test consisted of 6 questions. Based on the overall results of test, learning obstacle identified were students did not understand the meaning of the law of conservation of mass and students have obstacle looking at the concept of mass, the students thought in a chemical reaction mass of solid is greater than the liquid mass, and the mass of the gas is not considered. Student's learning obstacles were identified as a basis for designing the lesson design. This lesson design contained of sharing and jumping task activities. In the activity of sharing task there is a sharing material in accordance with the curriculum and should be understood by all students and on the activity of jumping task there is jump material that exceeds the level of the curriculum (Sato, 2013).

At the beginning in the design of learning activities, the teacher would be demonstrate a chemical reaction between vinegar acid and baking soda. Preparation of initial activity on learning design is based on one of the learning obstacle that is already identification students not taking into account the mass of the gas in a chemical reaction. When Vinegar $\text{CH}_3\text{COOH} (aq)$ and baking soda $\text{NaHCO}_3 (s)$ is reacted, they will produce $\text{CH}_3\text{COONa} (aq) + \text{H}_2\text{O} (l) + \text{CO}_2 (g)$. In this demonstration the teacher used a tool such as Y tube, balloon, spatula, pipette, measuring cups, and digital scales. The balloon is used as the cap Y tube, so when vinegar and baking soda is reacted, the balloon expands, indicates that the existence of gas produced. When the weighing is done, mass of substance before the reaction will be the same as the mass of matter after the reaction. From the demonstration, students are expected to understand that the gas has a mass and the mass of the gas have been taken into account.

Demonstration used material in the form of vinegar and baking soda is aimed to increase the interest and attraction to the students at the beginning of the learning process because the material close to the everyday lives of students. This is in line with the statements expressed by Nuridawani et.al (2015) that learning that starts from things that are close to the daily lives of students to its concrete will make students interested in learning so that learning occurs on an active and dynamic.

The purpose of the demonstration by Purnawirawanti et al (2013), are: (1) students are able to understand about how to arrange or compose something. (2) Students can watch the work of a tool or object. (3) Students can observe the section part of an object or tool. (4) when the students do it yourself, then he can also understand the use of a tool. Thus through the demonstration conducted by the teacher, the students are able to understand the expected tools and practical work steps, so students have no trouble on core activities, namely at a time when students do practical work themselves.

The next student activities are given in the sharing task activities in this activity students do practical work and discussions in small groups. Muchindasari (2016) said that in the process of learning expected of students got the experience to build the concept so that learning is not a teacher-oriented but more focused on students. Responsibility teachers strive to enable students in learning so that students acquire concepts rather than memorization or simply transfer the science but rather through the process. It is in line with the goals expected by researchers. Researchers hope by using the method of teaching and learning, small group discussions focused on students and through such activities the students can acquire and prove themselves the concept of conservation of mass that the mass before the reaction is equal to the mass of the after reaction.

The preparation of these activities is based on the student's learning obstacles which has identified as students do not understand the meaning of the law of conservation of mass and students obstacle in respect of the concept of mass, students thought that in a chemical reaction are considered solid masses greater than the mass of the liquid. Therefore, designed an experiment that reacting two solution are $\text{NaOH} (aq)$ and $\text{CuSO}_4 (aq)$ and the reaction of the two solutions resulted precipitate $\text{Cu} (\text{OH})_2 (s)$ and $\text{Na}_2\text{SO}_4 (aq)$. From this experiment, students are expected to find the concept that mass before reaction is

equal to the mass after reaction, although the reaction products already formed precipitates in the form of solids. Through learning like that enables students to discover the concept of conservation of mass itself, expected students not only memorized designation of the conservation of mass, but truly understand the meaning of the conservation of mass. After conducting the experiment, students would wrote down the observations, reactions equation and conclusions on the student worksheet as well as accomplish the task given. The tasks given in the form of the application of the mass conservation law in the calculation.

At the end of the activity, students are given the jumping task activities. At the end of this activity, students expected to deeply understand that in all chemical reaction mass after reaction is equal to the mass before reaction. In this activity, students were given several questions. These questions are questions with high-level cognitive level and including the high-level cognitive level into the analysis, evaluation and synthesis (Kasilingam, et. all, 2014). The first question talks about the rust of iron. student are given the phenomenon that rusted iron mass greater than the mass of iron before rusty.

Students are asked to explain whether this phenomenon is corresponding the conservation of mass and how to prove those reactions. Small group students discuss the answer of these question well. After that, the students discuss and report the results of the answer, next the teacher will give the reinforcement that the actual reaction of iron rust in accordance with the law of conservation of mass. If found the phenomenon of mass before and after reaction is different, there must be a mass of substance that that are not accounted for in these chemical reactions. In this phenomenon is the mass of a substance is not taken into account is the mass of a gas that reacts, so the mass before and after the reaction is different. This question also relates to student's learning obstacle who only focus on the solid mass alone while the mass of the gas is not taken into account. Therefore the teacher is giving the reinforcement that the gas involved in the chemical reaction has a mass. If the mass of the gas involved in the reaction is taken into account then the mass before reaction will be equal to the mass after reaction. Then ,the students were given a question again that is why in a chemical reaction that mass does not change (mass before reaction is equal to the mass after reaction)?. Students are asked to discuss in small groups. Based on the overall design of the existing activities in the lesson design, expected to overcome all the learning obstacles that have been identified. Based on the overall design of the existing activities in the lesson design, expected to overcome all the learning obstacles that have been identified.

Lesson design that have been developed implemented in grade X.1. On the activity of sharing task, collaboration student in the group has been going well, but there are still many teacher's involvement in the group, this was due to confusion in the students in writing tools and materials and also confusion in writting down the equation of the reaction. On the activity of Jumping, according to Sato (2014) if all students can work on problem of jumping task properly, it means the problema is too easy, reasonable level that can be attained by students in work on the problems of jumping is half the task or one third of the students in the class. Findings indicate, time management in jumping task activity hasn't done well. No group who were able to answer the first question jumping task properly. All groups responded that the reaction of rust of iron not include conservation of mass and that no group who can explain how to prove it. For the question why the mass in a chemical reaction does not change?, no students who were able to provide the desired response is that the mass in a chemical reaction does not change because the atoms in chemical reactions is not changed just a rearrangement occurs, this corresponds to dalton's postulates. But there are some students who responded that because elements in the chemical reaction remains the same even though new substance is formed, and just changes phase.

After implementation, re-test is conducted. From the results of the test and interview the students found that learning obstacles have been reduced but still exist. Teachers conduct self-reflection toward the learning that has been held. Then, lesson design that has been implemented in the class X.1 revised to be implemented in the class X.2. The revision lesson design was adding a chemical substance used in the lab practice activity. Substances which are added is substances $Pb(NO_3)_2$ (aq) and KI (aq). Based on the results of the reflection of teachers, there are several improvements in the learning process, the teacher will reduce its involvement in group activity, as well as improve the way confirm the observations of students. In the second implementation, students were more active in sharing and jumping task activities.

In jumping task activity, the findings indicate that there are two groups who stated that iron rust reaction in accordance with the law of conservation of mass. But no group gave correct answers related to how to prove the reaction of rust in accordance with the law of conservation of mass. For the question about why the mass in a chemical reaction does not change?, no students who can give an answer with associate with Dalton's postulates. However, there is group of students who associated it with the chemical equation must be equal. From the test results, show that reduced learning obstacles, no more students who wrote down the answer that the mass of sediment or solids would be heavier than liquid, but still there are students who do not take into account the mass of the gas in a chemical reaction that was still wrong answer.

4. CONCLUSION

Learning obstacle as the impact of the implementation of lesson design has decreased. Thus the lesson design can minimize the appear of learning obstacles related of conservation of mass concept, therefore this lesson design can be one of alternative learning of conservation of mass concept for high school.

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Students' Creativity In Solving Geometry Problems

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Abstract: The purpose of this study is to describe leveling of students' creativity in solving geometry problems based on their academic achievements. The indicator of creativity used are fluency, flexibility and novelty meanwhile there are five stages of creativity in mathematics problem solving as proposed by Siswono (2011). It is a descriptive research using qualitative approach. The subject of the research is three students in the first semester of Mathematics Department of University of Muhammadiyah Gresik. We categorized the students based on their mathematics achievement at the first competences, after that we took a student from each level based on their willingness and their ability in communication. Data collections used were documentation, observation and written test. From the data analysis we conclude that Subject S1 (High Achiever) lied in two different levels of creativity. On geometry problems in daily life, her creativity level is at the 3rd levels (creative) and in the problems of geometry theorem her creativity level is 2nd (Quiet creative). Subject S2 (Average Achiever) lied in the same level of creativity. On geometry problems in daily life, her creativity level is in the 2nd level (quiet creative) and in the problems of geometry theorem her creativity level is 2nd (Quiet creative). Subject S3 (Low Achiever) lied in two different levels of creativity. On geometry problems in daily life, her creativity level is at the 1st levels (less creative) and in the problems of geometry theorem; her creativity level is 0 (Not creative).

Key Words: *Mathematics Creativity, Level, Geometry*

1. INTRODUCTION

The Implementation of Indonesian Presidential Decree No. 8, 2012 about KKNI-Kerangka Kualifikasi Nasional Indonesia (Indonesian National Qualifications Network) changes the higher education curriculum paradigm from competence achievement to learning outcomes achievement. Learning outcomes is identified as skills which are reached through the internalization of knowledge, attitude, skills, competence and working experiences. In order to reach the outcomes it is very important for the teacher to shift his/her role to facilitate their students to learn. It is also important for the teacher to help students integrate their knowledge and apply what they learned in many situations. Some students may use a lot of time and effort in every chapter of subject matter but they lack of skills in solving various problems especially related to problem situations. Several studies recognized that creative abilities is essential in solving complex individual, social, and global problems (Amabile, 1983, 1985, 1989; Brown, 1989; Guilford, 1981; Plucker, Beghetto, & Dow, 2004; Wang, 2011).

Creativity is an interest topic to discuss but it is quiet complex and thus creativity has been defined in many ways by different authors (Gomes: 2007). Cambridge Dictionary mentioned that creativity is the ability to produce original and unusual ideas. Bergström at Pehnoken (1997) described creativity as "performance where the individual is producing something new and unpredictable". According to Munandar(2009) creativity means a capability to see or to think in an extra ordinary way or uncommon, fuse unrelated information and give new solutions or new ideas which shows fluency, flexibility and novelty in thinking. The definitions imply that creativity is happened when someone produces something that new, original or in an extraordinary way which shows fluency, and novelty in thinking.

Creativity is not a characteristic in certain subjects such as artists and scientist but it is a part of daily life, Pehnoken (1997). Mann (2006) also stated "the essence of mathematics is thinking creatively". Bishop (1981) pointed two different complementary modes of thinking in mathematics namely creative thinking and analytical thinking. Creative thinking is an "intuition" typical and analytic is "logic". While a

mathematician encounters a new problem we can see the creative performance. First he would experiment at random then they may set hypothesis which they try to prove gradually.

Bergström 1984 (cited in Pehkonen: 1997) introduced the concept of “everyday creativity” and “Sunday creativity” but was not specific to creativity in mathematics. The development of mathematical thinking in problem solving described by Gotoh (2004) on three stages, (1)the empirical/informal activity, (2)the algorithmic/formal activity, and (3)the constructive/creative activity. In similar Ervynck (cited in Aizikovitsh, 2014) mentioned three stages of mathematical creativity which are preliminary stages, algorithmic activity and creative activity. In Preliminary stage students can apply the mathematical rules and procedure without knowledge of the theoretical foundation. Algorithmic stages emphasize the ability of students to use the rules or procedures with the knowledge of theoretical foundation. In this stage students may involves modeling a situation and may include solving a word problem. Meanwhile in creative stage students involve non-algorithm where entails his/her new understanding of definitions or a new theorem. Aizikovitsh, (2014) stated that in this stage students employ sophisticated methods usually based on his/her assumption embedded in the problem.

To develop mathematics creativity in learning process teacher should pay attention to teaching materials and students’ role. We used CORE (Connecting, Organizing, Reflecting and Extending) model to facilitate various interaction, small group discussion, and students’ presentations, and to provide opportunities to struggle with open ended and or uncommon problems. CORE model consist of four stages namely Connecting, Organizing, Reflecting and Extending. In connecting stage, students connect their initial and new knowledge or between concepts. Organizing means organize the ideas to understand subject matters. Reflecting means rethinking, thinking in depth what they learned and Extending means an activity to develop, extend, use and create something different or new. We assumed that such situations could foster students to experience creativity in mathematics and thinking as mathematician in which they would try to encourage reflecting their ideas. The strengths of this model are students more active, they train to think critically toward a concept or a problem and the learning process give more experience to students. Meanwhile sometimes to implement the model teacher need an extra time and it may suitable for certain matter.

CORE model was implementing with problem solving during the Organizing stage. During the implementation of CORE model, we provided module and students’ worksheet for every meeting. We also gave many references for the students so that they could prepare themselves before the lesson. Problem solving according to Silver (1997) can be used to develop mathematical creativity. He stated that the indicators of students’ creative thinking are fluency, flexibility and novelty. Fluency in problem solving means students ability to obtain many solutions to a problem. Flexibility defined as students’ ability to solve a problem using many different methods meanwhile novelty includes an original solution which is uncommon for that student; grades or knowledge level. (Siswono, 2011) stated that there are similar characteristics among the level of creativity in problem posing and problem solving. He mentioned the levels of creative thinking in problem solving as follows:

Table 1. Indicator of Creativity Level in Problem Solving

Creativity Level	Description
Level 4 Very Creative	Student is able to solve a problem with more than one solution and can represent another way to solve it. One solution fulfills originality (novelty).
Level 3 Creative	Student is able to solve a problem with more than one solution, but he/she cannot represent another way to solve it. One solution fulfills originality (novelty). An alternative characteristic, he/she can represent another way to solve a problem, but he/she) cannot make a novelty solution.
Level 2 Quite Creative	Student is able to solve a problem with one original solution however it does not fulfill fluency or not flexibility. Or, he/she can represent another way to solve a problem; however, it is not noveltyor not fluency.

Level 1 Almost Not Creative	Student is able to solve a problem with more than one solution but cannot represent another way to solve it. The solution does not fulfill originality (novelty).
Level 0 Not Creative	Student cannot solve a problem with more than one solution and cannot represent another way to solve it. Solutions do not fulfill originality (novelty), fluency and flexibility.

(Siswono, 2011)

Based on the characteristics of the problems and the indicators of creativity, we made the indicators of creativity level as follow:

Table 2. Indicators of Creativity Level

Creativity Level	Fluency	Flexibility	Novelty
Level 4 Very Creative	√	√	√
Level 3 Very Creative	√	√	-
Level 2 Quite Creative	√	√	-
Level 1 Almost Not Creative	√	-	-
Level 0 Not Creative	-	-	-

Note:

Flexibility at level 3 means students find more than a solution for the problems, meanwhile for the level 2 flexibility means students only get one way to find the solution.

Many research constantly concerned the relationships between academic achievement and creative performance (Chamorro-Premuzic, 2006; Edwards & Tyler, 1965; Getzel & Jackson, 1958; Powers & Kaufman, .2004; Torrance, 1964; Toth & Baker, 1990; Wallach & Kogan, 1965; Yamamoto & Chimbidi, 1966) cited in (wang:2011) although it is not directly relevant. Livne and Milgram (2006) stated that intelligence can be used to predict mathematics achievement but not for creativity. In vice versa creativity of students cannot predict students' mathematics achievement. Therefore we conducted this study to describe students' creativity in solving geometry problems based on their mathematics achievements as the contribution to the creativity theory.

2. RESEARCH METHODOLOGY

It is a descriptive study with qualitative approach because the purpose of this study is to describe the level of students' creative thinking in solving geometry problems based on their academic achievements. The subject of this research is students in the first semester of mathematics education department in University of Muhammadiyah Gresik in 2015-2016 academic year. In order to get the data we used documentation, written test and interviews. We used triangulation time to get the validity of the test in which the researcher gave the test and did the interview that equivalent with the problems on the test at different time.

We ranked the students according to their achievement in the first test of Plane Geometry subject before the research. After that we categorized their score based on Arikunto (2003) as follows :

Table 2. Academic Achievements' Category

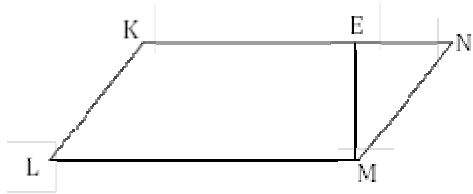
SCORE	CATEGORY
	Low
	Average
	High

After that we took a student in each category based on (1) their own willingness in participating the study (2) their ability in communicating their ideas written or orally. The students are FPS/S1 (high category), DA/S2 (average category) and DAL/S3 (low category). We analyzed these three students' answers and after that we interviewed them at different time to confirm their answer and get further explanation. Based on the students' test and interview we describe the creativity of the students based on their academic achievements.

We saw the level of students' creativity by giving them two problems in geometry. The first problem is the application of geometry in daily life and the second problem concern with geometry theorems. The application problem as follow:

*A monument was built in the center of three streets and making a triangle, the distance between the monument and those three streets around is equal. The length of each street 10 m. Determine:
a). The distance of each street to the monument, b).The area of kite made by the monument and the street*

Meanwhile the problems related to the geometry theorem concerned with parallelogram is :



Given a parallelogram KLMN with ME as the height. Prove

that the area of it is $KN \cdot ME$

3. FINDING AND DISCUSSION

This research was part of Implementation of Lesson Study. Four lecturers work collaboratively in planning the lesson, conducting the lesson and reflect the learning process. We categorized 16 students on the first semester based on their achievement on the first test. There are 3 high achiever, 10 students are average and 3 students are low achiever. We selected a student from each category. The level of mathematics achievement for subject 1 (S1) is high, for the subject 2 (S2) is middle, and subject 3 (S3) is low. From the test we got that students mark respectively from the high to low as follow 90, 70 and 40. Having determined the subject of the study, then we analyzed the video observation especially during the presentation and observed the test in the last period. We saw the level of students' creativity with two problems given in geometry course. The first problem is the application of geometry in daily life and the second problem concern with geometry theorem.

From the observation during the implementation of CORE method we found the level of students' creativity as follow:

a. High Achiever Student's(S1)creativity in solving daily life problems in Geometry

Creativity level of subject 1 (S1) on Application problem lied in level 3(creative) since subject S1 satisfy two aspects: fluency and flexibility. S1 was able to solve the given problem correctly, and found the solution through isosceles triangle and an inner circle of the triangle. S1 provided every step clearly and the pattern given is different from the reference given. S1 explained on the interview that she found that the kites are congruent so that she could divided the area of the triangle by three to get the area of a kite. Another way is finding the area of the circle in the triangle then subtracts the area of the triangle by the area of a circle and divided it into three equal parts. One part of the area adding with the area of a sector is the area of a kite.

The novelty didn't appear on her solution so that on the interview.

b. High Achiever Student's creativity related to geometry theorem

From the analysis conducted, creativity level of subject 1 (S1) lies in the level 2 (quite creative) since subject S1 satisfy two aspects: fluency and flexibility. Subject S1 is able to answer the question correctly, provide the steps but the pattern same with the references given.

To prove the theorem, S1 used a parallel line with ME through point D so that she got a rectangle. The base of a parallelogram is same with the length of the rectangle so that the height of the parallelogram. She found two congruent triangles so that the area is same. Finally she showed that the area is KN. ME as mentioned in the problem so that the theorem was proved. Here is S1 answer on the first problem.



Picture1. S1's Answer on application problem

The fluency and flexibility in providing answers might also affected by other references. So the novelty aspect has not yet appeared.

c. Average Achiever Student's creativity in solving daily life problems in Geometry

From the analysis conducted, creativity level of subject 2 (S2) lies in the level 2 (Quite Creative), where in solving daily life problem in geometry, the subject S2 made a picture to solve the problem. S2 satisfy two aspects: fluency and flexibility. First S2 calculated the distance of each street to the monument using the formula, $r = \frac{L}{s}$, after that found the area of the circle in the triangle then subtracts the area of the triangle by the area of a circle and divided it into three equal parts. One part of the area adding with the area of a sector is the area of a kite.

From the interview, S2 said that she look for and read other references before the lesson took place. It is may imply S2 answer toward the problem.

d. Average Achiever Student's creativity related to geometry theorem

From the analysis conducted, subject 2's (S2) creativity level in proofing geometry theorem lies in the level 2 since S2 satisfy two aspects: fluency and flexibility but not with different solution patterns. Subject S2 is able to provide the steps correctly but the pattern is equal to the reference given or taken. S2 using the same approach with S1 but she gave more note on the picture and explained step by step explicitly, but less practice compare with S1.

The fluency and flexibility in providing answers is also affected her willingness to look for and read other references. The novelty aspect has not yet appeared.

e. Average Achiever Student's creativity in solving daily life problems in Geometry

From the analysis we can say that the creativity level of subject 3 (S3) in solving daily life problem lies in level 1 (almost not creative), subject S3 is only fulfill 1 aspects. That is fluency. In working on the problems, Subject S3 are able to provide the steps to solve the problems but the

pattern she used was equal to the reference given. S3 cannot provide different solution due to the lack of reference that she brought. S3 only use references given by lecturers. From student's work, flexibility and novelty aspect has not appeared because the subject was not able to explore concepts beyond existing references. From the presentation video during the Lesson, subject S3 is unable to answer/explore other solution given to other groups.

f. Low Achiever Student's creativity related to geometry theorem

From the results of the analysis, creativity level of subject 3 (S3) lies at level 0, while solving problem related to geometry theorem, S3 was not meet the 3 aspects. Subject S3 is only able to copy the concept given and cannot complete the answer. S3 was not carrying other references. In the presentation video during the Lesson, subject S3 are not able to explain well and she was not give many argued.

The table below is a summary of the results of the analysis of students' level of creativity in geometry problems related to daily life situation and theorem.

Table 3. Level of students' creativity in solving daily life problems in Geometry

No	Subject	Indicator of creative			Level
		Fluency	Flexibility	Novelty	
1	S1	√	√	-	3
2	S2	√	√	-	2
3	S3	√	-	-	1

Table 4. Level of students' creativity in solving theorem problems in Geometry

No	Subject	Indicator of creative			Level
		Fluency	Flexibility	Novelty	
1	S1	√	√	-	2
2	S2	√	√	-	2
3	S3	-	-	-	0

Form the analysis of the data we know that no one of the subject at the top category of creativity. The highest level that they got is 3rd level which is in the very creative category on the application problem. On the theorem problem, the highest is 2nd level (quite creative). From the data we know that daily life problem give more probability to show students' creativity than theorem problem. When proofing the theorem, students must aware with certain axioms, or other theorems so that it is not easy to find another solutions since not all the axioms or theorems appropriate with the theorems that they want to proof.

The Subjects of this study are students in the first semester that accustomed to learn what they get from the lecture as they did in the high school. Reading references before the lesson are very seldom to do. Although reading is not automatically improving students' creativity, it can provoke students to think out of the box.

Developing Students' creativity is a longitudinal process. It needs creativity of the lecturer to provide various problems and various model of the lesson so that students' are treated to be creative problem solvers especially in mathematics.

4. CONCLUSION

Based on the result we can conclude that:

1. Subject S1 (High Achiever) lied in two different levels of creativity. On geometry problems in daily life, her creativity level is at the 3rd levels (creative) and in the problems of geometry theorem her creativity level is 2nd (Quiet creative).

2. Subject S2 (Average Achiever) lied in the same level of creativity. On geometry problems in daily life, her creativity level is in the 2nd level (quiet creative) and in the problems of geometry theorem her creativity level is 2nd (quiet creative).
3. Subject S3 (Low Achiever) lied in two different levels of creativity. On geometry problems in daily life, her creativity level is at the 1st levels (less creative) and in the problems of geometry theorem; her creativity level is 0 (not creative).

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**KNOWLEDGE SHARING MOTIVATION AND BENEFITS IN
FACULTY OF SOCIAL SCIENCES LESSON STUDY COMMUNITY (KLS) UNIVERSITAS
NEGERI MALANG.**

**MOTIVASI DAN MANFAAT PERILAKU BERBAGI PENGETAHUAN
DALAM KEGIATAN KOMUNITAS LESSON STUDY (KLS) FAKULTAS ILMU
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Abstrak : *Lesson study* (studi pembelajaran) adalah proses untuk memahami lebih jauh proses pembelajaran yang dilaksanakan secara bersama demi meramu pembelajaran yang lebih efektif. Kegiatan LS bukan menjadi hal yang asing bagi dosen Fakultas Ilmu Sosial Universitas Negeri Malang (FIS UM) karena kegiatan LS sudah dipraktekkan oleh para dosen sejak tahun 2012. Pada tahun 2016 para dosen berinisiatif mendirikan komunitas LS untuk menjaga keberlangsungan LS di lingkungan FIS UM. Penelitian bertujuan untuk memahami motivasi dan manfaat para dosen mengikuti komunitas LS FIS UM beserta kendalanya. Metode yang digunakan dalam penelitian adalah kualitatif deskriptif sementara instrument yang digunakan dalam mengumpulkan data penelitian adalah angket dan wawancara. Hasil penelitian menemukan bahwa motivasi dosen mengikuti komunitas tidak hanya untuk lebih mengembangkan diri tetapi juga untuk memberikan pelayanan yang lebih baik kepada orang lain (mahasiswa). Komunitas LS FIS selain bermanfaat untuk memperbaiki pembelajaran kepada mahasiswa juga bermanfaat bagi para dosen junior untuk belajar dari para dosen senior. Pengetahuan dan inspirasi dari dosen senior mampu memantapkan dosen junior dalam mengajar. Kendala yang dihadapi dosen dalam mengikuti kegiatan komunitas LS adalah seringnya kegiatan komunitas bertabrakan dengan kegiatan akademik lain. Apabila ini terjadi strategi yang dilakukan para dosen adalah skala prioritas. Hal yang dianggap penting didahulukan untuk dikerjakan daripada yang kurang penting. Kefleksibelan kegiatan komunitas memungkinkan dosen mengikuti komunitas tanpa mengganggu kesibukan sebagai pengajar.

Kata kunci: motivasi, manfaat, berbagi pengetahuan, Lesson study

Abstract : Lesson study is a process to better understand the learning process that carried out together in purpose to create more effective learning. Lesson study a familiar activity for lecturer at the Faculty of Social Sciences Universitas Negeri Malang (FIS UM) because LS activities have been practiced since 2012. In 2016 the faculty took the initiative to set up a community to sustain LS activity in the FIS UM. This research aims to understand the motivation and benefits of the lecturer that join to the FIS UM LS community and also its obstacles. The method used in this research is descriptive qualitative while the instrument used to collect research data were questionnaires and interviews. The study found that the motivation of lecturers following LS community is not only to develop themselves but also to provide better services to students. LS community FIS not only useful to improve learning quality for students but also beneficial for junior lecturer to learn from their senior colleague. Knowledge and inspiration from senior lecturer are able to establish junior lecturer confidence in teaching. Constraints faced by LS community member to full join the community are activities that usually collide with LS activities. When this happens the strategy done by community member are performing priorities scale. LS community allow its members to follow the activities flexibly so enabling the lecturer to join the community without disrupting their teaching role in university.

Keywords: motivation, benefits, share knowledge, Lesson study

INTRODUCTION

Knowledge sharing is human behavior that conducted from childhood to adulthood. Most human gained knowledge from interaction with others. Sergeeva (2015: 1) defines the knowledge sharing as an interaction between individuals where conversation and mutual acceptance of knowledge happen between one another.

For teachers, the knowledge sharing is very important because education is always changing and evolving. Runhar (2015:2) says that sharing information between teachers is important for the science development considering that technology have improved the ability of students to access information related to learning materials. In improving teacher capabilities, teachers can learn individually by reflecting on the learning that has done, updating knowledge by information on literature or be trying new teaching methods. The other thing to do is to learn from another teacher through learning communities or communities of practice. Sharing knowledge among teacher are beneficial because ideas can be synthesized to produce new knowledge.

Although knowledge sharing are important, it is very rarely done among teachers. Obembe (2012) explains that the reason why the knowledge sharing often fails in adult situation is because a sense of dilemma between giving knowledge for the common good or knowledge keeping for personal achievement. In line with Obembe, Kim (2015: 600) also explains that knowledge sharing is difficult to do because it opposed to a personal ratio. Rational person would not allow knowledge available for everyone, especially for those who do not contribute in building of knowledge. In organizational level the willingness to share knowledge is considered as a risk behavior and harm to be done because it can make people lose the opportunity to gain advantage in compete with others.

Runhaar (2015: 2-5) collects some of the constraints often prevent behavior knowledge sharing among teachers. Some of these obstacles are:

1. Feeling too confident in solving the problems
2. Fear of negative feedback from others. Negative feedback can reduce the confidence of teachers that then makes the teacher hesitated sharing knowledge .
3. Risk to losing the authority. Junior teachers who share their knowledge or give idea to senior teachers can lower the authority of senior teachers

Runhaar (2015: 13) emphasizes " *the risk of losing one's unique value, being taken advantage of, or receiving negative feedback can make people hesitant to engage in knowledge sharing*".

Motivation Knowledge Sharing

Although there are many barriers to the sharing of knowledge, there are some things that can motivate a person to share knowledge. Chen (2015: 824) says that the sharing of knowledge will occur when feelings of love becomes something bigger than rational motive. Lopez (2014: 476) agreed to this, the motive to share information one can be altruistic. Feeling helpful and being able to help others, naturally become a high satisfaction for someone to share information for the benefit of others.

For providing welfare to another person or a wider audience then Saxena (2015: 116) says that sharing knowledge is a manifestation of prosocial behavior. Definition of prosocial behavior is a person's voluntary action to improve the welfare of others.

In addition to the voluntary or altruistic sense, Merson (2015: 256) says that the knowledge sharing behavior also is in need of confidence (*trust*). In order for the sharing of knowledge can happen then each party should have three forms of trust, namely; (1) trust the giver of knowledge, (2). confidence in recipients of knowledge, and (3) confidence in the quality of knowledge given. In line with Merson, Kim (2015: 600) also shows that the level of trust, fairness and cooperation culture are several positive factors to bring a sense of willingness to share his knowledge with others.

Besides motivation, Chen (2015: 813-814) suggests three categories are supporting the knowledge-sharing behavior, namely:

1. Knowledge Characteristics to be shared, whether such knowledge is valuable, useful for completing tasks and easily articulated.

2. The opportunity to share knowledge (situational factors). Included in this category are as a culture in the workplace, vision and goals, and the availability of information technology supporting the most important managerial support.
3. The motivation to share, there are three types of motivation to share that concern the loss of power, the desire to get behind the gain or reward for sharing, and the hope of further relationship with the recipients of knowledge.

Support On Knowledge Sharing Event

Knowledge sharing among teachers cannot be done without the support of the institution where the teacher works. Runhar (2015: 15) explains that in order to encourage the knowledge sharing among teacher, the workplace atmosphere and support facilities are needed. School leaders must allow and facilitate teachers to learn together and always give positive feedback on the knowledge sharing activities they do.

Chen (2015: 825) suggests that the managers or leaders must support knowledge sharing activities by build a sense of security and justice among employees. This will foster a sense of interpersonal trust for knowledge sharing activities. All of this, then should be support by facilities such as information and communication technology (IT).

RESEARCH METHODOLOGY

This paper was written based on research to understand motivations and benefits gained by lecturer at the Faculty of Social Sciences, State University of Malang (FIS UM) in participating and sharing knowledge in Komunitas Lesson Study (KLS). The method used in this research is descriptive qualitative and data collecting instruments were questionnaires and interviews. The subjects are 15 lecturer member of KLS FIS UM. During the research documentation done by taking notes, photos, audio and video recording.

RESULTS AND DISCUSSION

Lesson study (LS) is a process to understand the learning process by lesson planning, observing and reflection (*plan, do, see*) done by group of learners. The aim is to made the lesson more effective for students. At the Faculty of Social Sciences Universitas Negeri Malang (FIS UM), LS activities is a familiar thing because it has been practiced since 2013. Starting with the financial support on LS implementation by government through Batch V LEPDISTI program. At 2016, in order to maintain the continuity of LS in FIS UM, lecturers who had once gain benefited from LS practice, took initiative to establish Komunitas Lesson Study (KLS). KLS aim is maintaining the continuity of LS in the FIS UM in order to formulate the effective learning format on social sciences and humanities study.

KLS FIS agenda is conducting *open class* once a month with alternated lecturer model from every department on FIS UM. Lesson planning activities carried out every week in first and second week of a month. Third week is stabilization and preparation of all object required in *open class* include the readiness of the classroom, schedules, student worksheets, presentation, observation sheets, camera and sound recorders. The last, week four is the implementation of activities *open class* that ended by reflection activities(*do, see*).



Figure 1. 1 knowledge sharing on KLS while doing lesson planning

Motivation to follow KLS

After interviews to 15 lecturer, members of KLS FIS it found various reasons and benefits that lecturer gain during the KLS activities. For the young junior lecturers that never learn about education strategies, KLS provides a place to learn about education from colleagues. For senior lecturers KLS help them to gain ideas and strategies from another.

Lecturer motivation joining KLS is largely to develop the quality of self. The others was to provide benefits to the others. Two lecturers claimed that they follow KLS because they want to improve their teaching quality in order to provide better services to students.

KLS benefits

For senior lecturers who had teaching experience, KLS is a medium to meet colleagues and share problems encountered in teaching and look for a solution together. In junior lecturer, KLS is place to adapt. Through KLS, the junior lecturer could gain knowledge from experienced senior lecturer. By observing senior lecturer, junior lecturer can get additional knowledge and ideas for more confident in teaching.

KLS FIS member have different educational background. This made the KLS activities can become media to know the development of another social science field. Through sharing knowledge, insights from all member are combined so they can look at problems comprehensively and find solutions effectively through a wide range of scientific viewpoints discussion.

Motivation Knowledge Sharing in KLS

Lesson study mechanisms which all lesson are planning together made KLS member willing to become a lecturer model. In *open class* phase, *lesson study* emphasizes that member must observed student to gain lesson, not lecturer. This mechanism makes the lecturer models can carry off teaching without fear to blame. Mistakes on *lesson study* are not understood as lack of capabilities but as a learning media that is should not be repeated in the future.

It found some reasons why the lecturer want to share the knowledge with others. Four lecturers share ideas because wanting to get corrections and perspectives of others in order the made the lesson more perfect. Sharing ideas is not going to make someone miss ideas but actually get more than one idea to develop insights. One lecturer added that knowledge sharing to other people would not make their competence loss but it can demonstrate their competence better to others.

In addition to the above reasons, one lecturer has a different motivation in sharing knowledge. This lecturers want to share knowledge because driven by his religion beliefs. In teachings of Islam it is believes that sharing of knowledge is a practice that give human unstoppable blessing.

The existence of individuals who first willing to share knowledge made the other lecturers share their knowledge in return. One KLS member say that through KLS he has got a lot of knowledge from colleague so then he wanted share knowledge for the benefit of others.

Despite the willingness of sharing knowledge is important for the community, but this will not work if KLS members do not have the ability to hear. One KLS members emphasized that in effort to sharing knowledge, not only a willingness to share knowledge it is important but also the ability of listener to hear. The presence of KLS member who want to listen friend's opinion made KLS member do not hesitate in sharing knowledge.



Figure 1. 2 knowledge sharing atmosphere at the KLS reflection stage

Means of Support on KLS FIS

KLS activities can be done because support of the existing infrastructure at the Faculty. Faculty of Social Sciences through first vice Dean (Wakil Dekan 1) support KLS activities by providing classrooms that roomy and clean especially to conduct KLS activities every Friday afternoon.

In addition to the support of the institution, the existence of communication media through *whatsapp* messenger that owned by each member of KLS also makes it easier to coordinate. Through this information medium, KLS activity and schedule can always be update and monitored by member. Every each activity completed, members of KLS are asked to sharing photos so the other members that unable to attend can know the progress in KLS. By information technology medium, KLS activity that be consistently implemented in accordance to agenda agreed.

Obstacles Faced by KLS

Although the agenda of KLS is set in time that not collide with teaching agenda of lecturers (Friday afternoon), often KLS collide with meeting agenda in department. To overcome this constraints lecturer member of KLS confessed to have strategic priorities. He join activities that more important and then leave activities that are not too important. One lecturers said that KLS activities is a part of his academic activities so the other academic activities that are not too important can be rescheduled in order to follow KLS.

The next obstacle is KLS activities is done on the 3rd floor of the building so making it difficult for members who have physical barrier such as pregnancy to follow the KLS activities continuously. Regarding this difficulties KLS members hope that faculty is willing to give classroom that more accessible in the first floor so all lecturers can follow it.

In order to become better, KLS members also hoped that KLS can be opened to public so the members is not only from lecturer but also school teacher. By this, knowledge sharing activities can occur better and more comprehensive.

DISCUSSION

Results of the study found that the motivation of lecturers followed KLS caused not only to develop themselves her but also altruistic motive in order to provide better service to others (student).

KLS who routinely did *Lesson study* is not only beneficial to improve the lecturer quality of learning but also become the media for junior lecturer study the knowledge and experience of senior lecturers. Through the activities of KLS, junior lecturer can see senior lecturer *open class* so they can be inspired and establish themselves in their new profession as a lecturer.

The existence of KLS for FIS lecturers is very important because it function to be a knowledge sharing media and experience among lecturers that have different social science background. Through the knowledge sharing, lecturers can know the progress of other science and problems can be seen in full perspective by variety of social science viewpoint.

The knowledge sharing in the KLS happen starting from individuals who want to share their problems and get feedback from other. The other people response as result of their desire to help. The discussion that followed provide new knowledge to all of members in the community that makes them all willing to share knowledge as means of reciprocity. Knowledge sharing activities in KLS was not only concerned with the ability to share knowledge, but also need the ability of KLS members to listen to the knowledge of others. Through sharing and listening knowledge, knowledge sharing activities can be benefit to all. KLS members did not worry about knowledge sharing that can make someone losing ideas or competence. They believe through knowledge sharing will make the ideas to flourish by gain response from other.

The constraints faced by the FIS lecturers in following the activities of KLS is often the agenda of the KLS collide with other academic activities such as meetings. If it is happen, the strategy of lecturers is to determine the priority scale. Means support such as existence of modern information technology is crucial for the continuation of activities KLS. By means of this modern communication technology KLS activities can be coordinated and communicated better, so all KLS members can monitored the implementation KLS agenda.

Someone will remain in a community if it always give benefit from them. Lopez (2014: 477) found that the more people split a negative emotion in the forum, the smaller satisfaction gaining by people in the forum. Based on this it can be said that future continuation of KLS are depend on how KLS giving benefit to its members. KLS should always be able provide valuable things that are positive for members.

CONCLUSION

The existence of knowledge sharing community such as KLS FIS UM is important to education institution. KLS forum primary function as a medium to share knowledge and experience from senior lecturer to junior lecturers vice versa and also means to improve the teaching quality.

Corresponding to the view of experts that community will not survive unless it continue to provide positive benefits for members. Therefore it required the creativity of community manager in order to KLS activities not become stagnant and monotonous.

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Improving Teachers' Ability in integrating Character education into Mathematics Subject Matter through Lesson Study in Group V Sukasada Sub-District

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Abstract :This research belongs to lesson study which aims at improving elementary schools' teachers competency in integrating character education in mathematics subject matter started from designing lesson plan to the implementation. Besides, the quality of character values was observed as shown by the students during the instructions as the results of the improvement of teachers' competency. the study was conducted in group V Sukasada sub-district which consist of 9 units of schools and the subjects were the teachers of the fourth grade students. the data about teachers' ability in designing the lesson plan and conducting the instructions by inserting characters values was gathered by using instruments as well as collecting the data about students' characters during the instructions in each cycle by conducting observation sheet which later was analyzed by using descriptive statistic. the results show that there was any significant improvement on the scores of designing lesson plan designed by the teachers of the fourth graders in group V Sukasada sub-district in each cycle. on cycle I, the mean score was 69.76 by achievement level 58.06%. On cycle II the mean score was 96.67 by achievement level 80.56% and on cycle III the mean score was 109.33 by achievement level 91.11%. Teachers' ability of conducting character education-based math subject matter was also improved significantly. On cycle I the mean score was 107 by achievement level 62.94%. On cycle II the mean score was 138.67 by achievement level 81.57% and on cycle III was 152 by achievement level 89.41%. the results of observation show that from the 7 characters developed, there were 2 character values which did not improve in each cycle. They were logical thinking and responsibility.

Abstrak :Penelitian ini merupakan penelitian tindakan berupa lesson study yang bertujuan untuk meningkatkan kompetensi guru sekolah dasar mengintegrasikan pendidikan karakter dalam pembelajaran matematika mulai perancangan dan pelaksanaan pembelajaran. Selain itu, diteliti kualitas nilai-nilai karakter yang ditunjukkan oleh siswa selama pembelajaran sebagai dampak dari peningkatan kompetensi guru. Penelitian dilakukan di Gugus V Kecamatan Sukasada yang terdiri atas 9 unit sekolah dan yang menjadi subjek penelitian adalah Guru Kelas IV. Data kemampuan guru dalam merancang dan melaksanakan pembelajaran matematika yang mengintegrasikan pendidikan karakter dikumpulkan dengan instrument penilaian yang dirancang penelitian data nilai-nilai karakter siswa selama pembelajaran di tiap siklus dilakukan dengan lembar observasi yang selanjutnya dianalisis menggunakan analisis deskriptif kuantitatif. Hasil penelitian menemukan bahwa terjadi peningkatan yang signifikan skor rata-rata RPP yang dirancang guru-guru SD di Gugus V Kecamatan Sukasada di tiap siklusnya. Pada siklus I skor rata-rata RPP guru adalah 69.76 dengan tingkat pencapaian 58.06%, pada siklus II skor rata-rata adalah 96.67 dengan tingkat pencapaian 80.56%, dan pada siklus III skor rata-rata 109.33 dengan tingkat pencapaian 91.11%. Kemampuan guru melaksanakan pembelajaran matematika berorientasi pendidikan karakter juga mengalami peningkatan yang signifikan. Pada Siklus I diperoleh skor rata-rata kemampuan melaksanakan sebesar 107 dengan tingkat pencapaian sebesar 62.94%, pada Siklus II sebesar 138.67 dengan tingkat pencapaian sebesar 81.57%, dan pada Siklus III sebesar 152 dengan tingkat pencapaian 89.41%. Hasil observasi menemukan bahwa dari tujuh nilai karakter yang dikembangkan, terdapat dua nilai karakter yang tidak mengalami peningkatan di tiap siklusnya yaitu berpikir logis dan tanggung jawab.

Kata Kunci: lesson study, matematika, karakter.

1. INTRODUCTION

Education holds important thing in the process of increasing the human resources. According to the Regulation Policies No. 20 year 2003 national education has function to develop and create the character and also to dignified human civilization in the framework of educating nation, aiming in

developing the potential of learners in order becomes faithful and devoted to Almighty God, noble, healthy, knowledgeable, competent, creative, independent, and becomes democratic community and responsible. It shows that the system of national education should be able to develop the ability and create the character of learners.

The important of the character can be shown from the result of this study in Harvard University of United State which explain that a success of person cannot determined by the knowledge and the ability (hard skill) that gain through education, but it more on the ability of to manage themselves which includes character and others (soft skill). Moreover, the success person in the world can be succeed because it more supported by the ability of their soft skill rather than hard skill (Adisusilo, 2011).

The government has already addressing this character education by formulating the competency standard bot in the elementary level, senior level, and university in which has the ability in psychomotor, affective and cognitive. Relating to the implementation of the character education at school, the process of creating the students character as the responsibilities of the religion teacher, civic education or the counseling guidance teacher (Hadi, 2015). Supposedly, the character education should be the responsibility of all teachers that can be done in integrating the character value in every subject includes mathematic subject.

Etymologically, the terms of character is taken from Greek, such as *kharakter*, *kharassein* and *kharax* which the meaning is an apparatus for marking (El-Mubarq, 2008). The character education defines as the type of education which has purpose to fostering the behavior and personality through moral and ethics education. The National Education Policies (2010) identify eighteen character values which have to be integrated in learning, there are: (1) religious, (2) honest, (3) Tolerant, (4) Discipline, (5) hard work, (6) creative, (7) Independent, (8) democratic, (9) curiosity, (10) national spirit, (11) love homeland, (12) rewarding achievement (13) relationship/communicative, (14) love peace, (15) font of reading, (16) caring environment, (17) social care and (18) responsibility.

The teachers are expected to choose the character values that match with the basic competency that being taught. But, in reality, the teachers still look hesitate in entering the variable character in the lesson plan made by them which are cause by no guidance or standardization on how to integrated the character value to the learning. The same thing happened to the elementary teachers in cluster V Sukasada district. Based on the result of the observation done previously, the average of the elementary school in cluster V Sukasada district already implemented the character education in the suitable subject especially in the mathematic subject, but that character education not integrated well and thorough the learning advice used, so the implementation of the character education in the learning process invisible.

Based on the interview with the head of the elementary school in cluster V Sukasada district found that the head master is still lack in oversight the teacher in doing the learning based on character. The oversight is limited in the presence of the teacher in the classroom regardless of the quality of learning which is done. This is reasonable given the knowledge and insight from the principle related to the character education and the implementation in in the learning is still lack. Besides, the involvement of group works of teacher (KKG) as a vehicle discussion in increasing the learning quality which is still not optimal. The meeting was limited equalization perception of the structure (without seeing the quality of content) learning media and it is not discussing the construction that face by each teacher in implementing the media in learning.

Based on the problem that describe above especially the integrating of character education in mathematic subject, needed a new learning pattern which is called as lesson study. Lesson study is model professional guidance for educator through assessment of collaborative learning and continued based on the collegiality principals and mutual learning to build learning community. By the pattern of lesson study, the teachers get ideas and comprehensive information about the integration and the development of character values in learning mathematic and boils down to the quality of the character values that showed by students. Therefore, this research focus in (1) knowing the increasing of teacher ability in integrating the character education in the mathematic lesson plan; (2) knowing the increasing of the teachers' ability

in integrating the character education in implementing the mathematic learning and (3) describing the quality of the students' character values during the mathematic learning.

This research was a cyclical measurement. The action given was the lesson study activity divided into three steps; there are 1) *plan*, 2) *do*, and 3) *see*. Those three steps was the sustainable cycle adjust to the condition after the *see* step (reflection), means that one cycle action is divided into three steps above. The study was done in Cluster V, SukasadaSub-district divided into 9 units of schools there were SDN 1 Sambangan, SDN 2 Sambangan, SDN 3 Sambangan , SDN 3 Sambangan (main elementary school), SDN 1 Panji, SDN 2 Panji, SDN 3 Panji, SDN 4 Panji, SDN 5 Panji, and SDN 6 Panji. The subject of this study was the teacher of IV grade in Cluster V SukasadaSub-district, while the object of this study was the IV grade teacher's ability in arranging and implementing mathematic learning integrates character education, and the character's values indicated to the students as a result of learning arrangement and implementation done by the teacher.

The data of teacher's ability in arranging and implementing the mathematic learning that integrates character education submitted by assessment instrument arranged by the researcher by modifying the components in assessment of teacher competence (PKG). The character value of the students during the learning process in every cycle was done by the observation sheet. The data submitted was limited to the one of the VI grade teacher's ability in Cluster V, SukasadaSub-district chosen to be plot teacher and the result from data analysis used to integrate IV grade teacher's ability in Cluster V Sukasada Sub-district. The assessment processto the teacher's ability wasdone by3 researchers. The data analysis used descriptive quantitative analysis and the decision done based on the five scale conversion as follow.

Tabel 1 The Five Scale Achievement Level of Conversion Guidance

Achievement's Level (%)	Qualification
90 – 100	Very Good
80 – 89	Good
65 – 79	Enough
55 – 64	Less
0 – 54	Very Less

2. RESULTS AND DISCUSSION

RESULTS

The result in every cycle includes the scoring data of lesson plans by integrating character's values arranged by the teacher and teacher's ability in implementing the learning based on lesson plan. The lesson plan arranged in plan step is lesson plan and understanding standard competence and use operation of arithmetic's characters to solve the problem, and basic competence of arranging the number. The result of lesson plan's assessment arranged by the teacher in detail showed in Table 2.

Tabel 2. Lesson Plans Score Cycle 1

No.	Lesson Plan Components	Researcher I	Researcher II	Researcher III
1.	Indicator Formulation and the purpose of learning including the expected character	16	15	15
2.	Selecting and organizing teaching material	15	16	15
3.	Selecting the learning resource/learning media	10	12	12
4.	Model, Method, and Learning Strategy	14	15	12

5.	Assessing Learning Achievement	15	12	15
	Total Score	70	70	69
	Average	69.67		
	Maximum Score	120		
	Score percentage	58.06%		

Table 2 showed that the result's average in scoring lesson plan component from three assessor is 69.67 which was the percentage of level of achievement was 58.06% and categorizing in enough category.

The result of teacher's ability in implementing the learning based on the lesson plan arranged by on the plan step showed in table 3.

Table 3. Score of Teacher's Teaching Ability in Cycle I

No.	Aspects Observed	Researcher I	Researcher II	Researcher III
1.	Pre-Learning Activity	8	10	10
2.	Opening the Learning Activity	6	6	8
3.	Whilst Learning Activity			
	A. Mastering of Learning Materials	12	14	12
	B. Approach/Stragegy of Learning	21	21	20
	C. Utilization of Learning Media	10	9	9
	D. The learning which encourages students and maintaining of students involvement	19	20	22
	E. The assessment process and the result of learning	8	10	10
	F. The use of language	8	12	8
4.	Post-Learning	8	10	10
	Total Score	100	112	109
	Average Score	107		
	Ideal Maximum Score	170		
	Percentage Score	62.94%		

Table 3 shows that the teacher's ability score implements the learning which integrates the character value, it is obtained an average total score of 107 with the percentage of achievement levels 62.94%. It is in the category quite.

The lesson plan designed in Cycle II is lesson plan with the standard of competence to understand and use the characteristic of numbers arithmetic in problem solving, basic competence in doing an assessment and concluding. The lesson plan designed of teacher in this cycle is summarized in table 4 below.

Table 4. The Lesson Plan Score in Cycle II

No.	Lesson Plan Components	Researcher I	Researcher II	Researcher III
1.	Formulation of indicators and learning objectives include character values which expected.	23	23	25
2.	Election and organize the learning	23	21	20

	material.			
3.	The learning source/learning media	15	15	16
4.	Model, Method, and Learning Strategy	20	19	20
5.	Learning outcomes assessment	16	16	18
	Total Score	97	94	99
	Average Score	96.67		
	Ideal Maximum Score	120		
	Percentage Score	80.56%		

Table 4 shows that the average score of lesson plan component from three evaluators is about 96.67 with 80.56%. It is in the good category.

The result of teacher's ability assessment implements the learning corresponding to lesson plan in Cycle II described in table 5 below.

Table 5. Score of Teacher's Teaching Ability in Cycle II

No.	Aspects Observed	Researcher	Researcher II	Researcher
		I		III
1.	Pre-Learning Activity	8	10	10
2.	Opening the Learning Activity	10	10	8
3.	Whilst Learning			
	A. Mastering of Learning Materials	16	17	16
	B. Approach/Stragegy of Learning	28	27	28
	C. Utilization of Learning Media	16	17	16
	D. The learning which encourages students and maintaining of students involvement	26	25	25
	E. The assessment process and the result of learning	10	10	10
	F. The use of language	12	13	12
4.	Post-Learning Activity	12	12	12
	Total Score	138	141	137
	Average Score	138.67		
	Ideal Maximum Score	170		
	Percentage Score	81.57%		

Table 5 shows that the teacher's ability score implements the learning which integrates the character value, it is obtained an average total score of 138.67 with the percentage of achievement levels 81.57%. It is in the good category.

The lesson plan designed in Cycle III is lesson plan with the standard of competence to understand and use the factors and multiples in problem solving, and the first of basic competency is to describe factor and multiples concept in doing assessment. The second basic competency is to define the factor and multiples number. The result of lesson plan assessment designed by the teacher in detail showed in table 6 below.

Table 6 The Score of Lesson Plan in Cycle III

No.	Lesson Plan's Components	Researcher	Researcher II	Researcher
		I		III
1.	Designing the indicator and the purpose of learning including the expectation of characteristic's values	28	28	26

No.	Lesson Plan's Components	Researcher	Researcher II	Researcher
		I		III
2.	Choosing and organizing learning material.	24	24	25
3.	Choosing learning sources/learning media.	18	19	18
4.	Model, Method, and Strategy of learning.	22	23	24
5.	The assessment of learning process.	17	16	16
	Total Score	109	110	109
	Mean Score	109.33		
	Ideal Maximum Score	120		
	Percentage Score	91.11%		

Table 6 showed that the mean scores of the component of lesson plan from three judges were 109.33 which the percentage level of achievement around 91.11% and it categorized as very good.

The total score of teacher's ability in implementing the learning process was suitable with the lesson plan in cycle III which has been explained in Table 7 here.

Table 7. The Score of Teacher's model Teaching Skill in cycle III

No.	Observed Aspects	Researcher	Researcher II	Researcher
		I		III
1.	Pre-learning	9	10	10
2.	Opening of learning	9	10	9
3.	Core activity of learning			
	A. The comprehension of learning material	17	18	18
	B. The approach/ strategy of learning	31	30	32
	C. The utilization of learning media	18	17	18
	D. The learning process which trigger and manage the students' involvement	28	26	26
	E. The assessment of the learning process and the learning outcomes	12	10	12
	F. The usage of language	15	14	15
4.	Closing	13	15	14
	Total Score	152	150	154
	Mean Score	152		
	Ideal Maximum Score	170		
	Percentage Score	89.41%		

Table 7 showed that the score of teacher's skill in implementing the learning process which integrated with the character's value, obtained the total mean score around 152 with percentage level achievement around 89.41% and it categorized as good.

The result observation of character's values which was showed by students during the learning process in every cycle can be seen in Table 8.

Table 8. The Result Observation of Character's Values of Students

No.	Developed Characters	Quality		
		Cycle I	Cycle II	Cycle III
1.	Religious	Appear	Develop	Be entrenched

2.	Curiosity	Not appear	Appear	Appear
3.	Think logically	Not appear	Not appear	Not appear
4.	Confidence	Not appear	Appear	Appear
5.	Well-behaved	Appear	Develop	Be entrenched
6.	Team work	Not appear	Develop	Develop
7.	Responsibility	Not appear	Not appear	Not appear

3. DISCUSSION

Based on the analysis of the research data was found that there was a significant mean score of lesson plan which designed by the teachers in Elementary school in Cluster V Sukasada Sub-district in every cycle. In cycle I the mean score of teacher's lesson plan was 69.76 with the achievement score 58.06%, in cycle II the mean score was 96.67 with the achievement score 80.56%, and in cycle III the mean score was 109.33 with the achievement score 91.11%.

The lower score of the lesson plan which was designed by the teacher in cycle I was caused of the lack comprehension of teacher which related to the components of lesson plan which became the demand of the curriculum so in planning, the teachers were passive and they only arranged the lesson plan based on the examples of lesson plan which were used by the teachers. The errors which were found in designing the lesson plan in cycle I can be seen as follows: 1) The error in designing the indicator and the purpose of learning; 2) Learning did not show instructions which develop good characters' values in test as well as in material, and (3) inappropriate scoring with the learning indicators. Besides, teachers are not getting used to design lesson plan and seems doubtful in giving opinion and suggestions.

The data analysis show that the teachers' ability in doing the math instructions was oriented on character education was also developed significantly. On Cycle I, it was found the mean score as much as 107 by achieving level as much as 62.94%, On cycle II it was 138.67 by achieving level as much as 81.57% and on cycle III it was 152 by achieving level as much as 89.41%.

Teachers' ability in conducting math instructions which was based on character education on cycle I was categorized into low category. This could be affected by the factor where unconfident teachers in conducting the instructions. This was reasonable since in open class, there were some observers including the principals saw the implementation. The interactions happened in the classroom was too stiff and cold. Even more, there were some steps of character education which were contained in the lesson plan were not shown in the implementation. The instructions seemed too cold and passive and were dominated by high level students.

The improvement of lesson plan's quality and the ability of teachers to conduct the math instructions which were based on character was merely the direct effect of the quality improvement through lesson study on each cycle. On cycle II, teachers were already brave to state innovative ideas based on the experiences in each school. The predictions done by the model or other teachers became more varied and had effect on the quality of the lesson plan. This show that lesson study directly improve the teachers' pedagogy competency. Some researches show that lesson study could improve the quality of the content and teachers' ability in conducting the instructions (Alvine, Judson, Schein, dan Yoshida, 2007). As well as done by Pektas (2014) that lesson study brought positive effect on prospective teachers of elementary schools started from designing lesson plan, content, and students' assessment.

Lesson study brings some positive and is regarded as effective in changing the practice of teachers' instructions such as using the material to focus on the problems to be meaningful, taking context of instructions and teachers' explicit experience, and giving many opportunities to teachers in holding the relationship with others. In other words, lesson study gives more opportunities to teachers to give ideas on education, especially in instructions, and to learn how to teach based on students' perspective about learning and instructions. The results in this study is supported by the statement from Cerbin& Kopp (2006) that lesson study helps to improve teachers' knowledge as well as the quality of the instruction.

Based on the analysis on the characters' value shown by the students in the process of learning, there was a significant improvement on the whole characters' value developed in the instructions. The

improved characters values were religion, curiosity, confidence, cooperation, and good manner. This happened because consistently teachers implemented the characters in every cycle. It was different as shown in cycle I where the characters were not shown in the instructions. This result is the same as stated by Rachman (2010) where character education should be consistent, continue, and consequent as an aware effort and planned to develop the characters into students' selves.

The characters which were not developed in each cycle were logical thinking and responsibility. Based on the observation and responds from the observer, the values were difficult to develop since the ability of students in elementary schools was too low. Tests nor math problems were difficult to understand. This makes sense where teachers mostly gave procedural tests.

4. CONCLUSION

Based on the results in this study, it can be concluded that this lesson study could improve the teachers' competency in designing and doing mathematics instructions by implementing character education. This is shown by the scores in each cycle where the improvement directly gives impact on the quality of characters values shown by the students during the instructions. Therefore, it is suggested that teachers in group V Sukasada Sub-district should continue lesson study continuously and consistently by developing the character values in the instructions conducted.

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**IMPLEMENTASI PENDIDIKAN LINGKUNGAN HIDUP BAGI MASYARAKAT DALAM
MENGOLAH LIMBAH PLASTIK MENJADI
“BBM LITIK”**

**IMPLEMENTATION OF ENVIRONMENTAL EDUCATION FOR SOCIETY IN PROCESSING
PLASTIC WASTE INTO "BBM LITIK"**

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Abstract: Plastic waste is one of the synthetic waste that not easily be decomposition. Plastic waste requires special processing so as not to pollute the environment. Plastic waste processing is done to reduce the number and produce products that are beneficial to society. Environmental education need to be implemented not only in schools but also in the society. "BBM Litik" (Bahan Bakar Minyak Limbah Plastik) is one effort in processing plastic waste. This program is implemented in Pelem village, Magetan from April until June 2016. The method used is the design tools, test tools, socialization, training, practice, mentoring, and evaluation. The results of this activity are: 1) processing equipment "BBM Litik", 2) product of "BBM Litik" 3) Improvement of society knowledge in the processing of plastic waste and 4) Reduction of plastic waste. The society was very enthusiastic in training. Society has the knowledge and ability to process plastic waste into "BBM Litik". The amount of plastic waste in Pelem village, Magetan reduced by 50%. This shows that the "BBM Litik" can be used as an alternative treatment of plastic waste for the benefit of society.

Key words: BBM Litik, Environmental Education, plastic

1. INTRODUCTION

The use of plastics in our daily lives more and more popular because it has many advantages. But the plastic waste cannot be decomposed easily by the soil, resulting in pollution. Pelem is one of the villages that produce a lot of plastic waste. Mostly people are less concerned about the environment, it can be seen from their habit of throwing or burning plastic waste without considering the environmental health. They have not known yet about the importance of environmental education and how to process plastic waste.

Plastic is a macromolecule formed by the polymerization process. Plastics can be classified into 2 kinds, those are: thermoplastic and thermosetting. Thermoplastic is plastic that when it is heated to high temperatures will melt and could be reshaped into a desired shape. While thermosetting plastic cannot be melted again by heating (Surono, 2013). In general plastic waste has composition of 46% Polyethylene (HDPE and LDPE), 16% Polypropylene (PP), 16% Polystyrene (PS), 7% Polivinilclorida (PVC), 5% Polyethylene terephthalate (PET), 5% Akronitil-butadien- styrene (ABS) and 5% other polymers (Prasetyo *et.al*, 2011; Nugraha *et.al*, 2013, Surono, 2013).

Recently, plastic waste has been just dumped and burned, causing side effects such as pollutants, carcinogens and other pollutant particles (Ermawati 2011; Ramadan and Ali, 2011). The handling of plastic waste is now known as the 3R (reuse, reduce and recycle). One application of plastic waste that is currently developed is pyrolysis, hydro-cracking, and hidroisomerasi. Pyrolysis is a burning technique of plastic waste without O₂ and is done at high temperature around 230°C - 1000°C (Mustafa and Zainuri, 2014; Ermawati 2011; Nugraha *et.al*, 2013; Surono, 2013). This technique produces environmentally friendly gas that is non-toxic and produces liquid hydrocarbons. Factors that affect the process of pyrolysis are temperature, time, particle size and weight of the particles. (Ramadan and Ali, 2011). Pyrolysis process can also be modified by using reforming system of a catalyst (Nugraha *et.al*, 2013).



Figure 1. Plastic waste in Pelem Village

Environmental education for the community is one effort to take care for the environment and natural surroundings. Environmental education is not not only to be done in schools, but also in the community. The successful management of the environment is affected by the level of public awareness to run environmental education. The scope of environmental education includes several things: institutional, human resources, facilities and infrastructure, funding, communications, information, community role and methods of achieving the target (Dewi, 2013). The general objective of environmental education for the community is to gain awareness, knowledge, attitudes, skills, participation and evaluation. The effort to invite the community for caring the environment and managing plastic waste are done by persuasive methods and approach.

Socialization and training are done to urge people directly to practice in real condition. It would require creative and applicable efforts to process plastic waste. One of the efforts is through training, outreach and mentoring program "BBM Litik" (Fuel Plastic Waste).

The purposes of this study are 1) To make a tool which is able to proceed plastic waste into BBM Litik. 2) To produce pyrolysis of plastic waste into BBM Litik. 3) To increase public knowledge about the environment education and the process of plastic waste into BBM Litik. 4) To reduce plastic waste in the village Pelem, Magetan.

2. RESEARCH METHODOLOGY

This research is a qualitative descriptive study and conducted for 3 months from April to June 2016. The target of this study is 20 persons from Pelem Magetan. The methodology in this study are:

a. The design of the tool

The tools used to make "BBM Litik" made of a simple apparatus that LPG cylinders, dim half-sized iron pipes, iron pipes, condensers, large hose, a small hose and connecting hose.

The work steps to make the tool are: 1) LPG is modified to provide channels to put the plastic waste on the side and at the top, connect it with an L-shaped metal pipe as high as 30 cm. 2) The small pipe is connected to a hose. Then, connect the large hose to the smaller hose. 3) Connect the hose to the condenser for discharging oil.

b. Socialization and training

Socialization and training are given to emphasize the importance of environmental education for the community. Besides that, training and socialization are given so that people are able to process plastic waste into "BBM Litik".

c. The knowledge of society

The increasing knowledge of the society is scored by giving tests related to description of the material. Society is considered as having enough knowledge about "BBM Litik" when the obtained score is more than 65. In addition, community's skill is also evaluated through observation sheet. The Indicators of society's skill success is seen from the percentage of achievement more than 70%.

d. Plastic waste in the community.

Methods to determine the reduction of plastic waste is by observing directly the plastic disposal in each houses.

3. FINDING AND DISCUSSION

The results of this study covers several aspects, those are: design tools, socialization and training, achievement of the society's knowledge, and the amount of plastic waste on post-study.

a. The design of the tool

The tool that is used for processing plastic waste is fairly simple to take items that exist in the surrounding. The tool uses the principle of pyrolysis and fractional distillation. Plastics will be heated in a reactor with a high temperature above the melting point, there will be a polymer vapor that passes through the cooling pipe then is condensed to produce alternative fuels from plastic waste. Prasetyo *et.al* (2011) said that plastic waste processing machines are very applicable and can overcome the problem of environmental pollution due to plastic waste which is difficult to decompose.



Figure 2. The tool of BBM Litik

This tool can be used on a small scale to reduce household plastic waste. The tool is also designed with the principle of recycle, using unused goods. The use of tools from the recycle is one of the implementation of environmental education for the community.

b. Products of "BBM Litik"

"BBM Litik" is the result of the pyrolysis process and fractional distillation of plastic waste. It can be used as an alternative fuel in a variety of sustainable research. In general, the pyrolysis process 1 kg of plastic will produce approximately 900 ml "BBM Litik". Plastics that used are polyethylene and polypropylene. The factors that affect the pyrolysis process are time, particle's temperature and weight (Ramadhan and Ali *et.al*, 2011).



Figure 3. BBM Litik

The research of Nugraha *et.al* (2013) showed that the type of polyethylene plastic can be processed into liquid fuels by pyrolysis method. Activated carbon is an efficient catalyst for this type of degradation and can produce higher amounts than aromatic compounds. Activated carbon is chosen for its heat resistant, inexpensive and a good catalyst for the degradation of polyethylene waste. Pyrolysis of plastics with high temperature will produce CO₂ and H₂O that are environmentally friendly (Ermawati, 2011). When Polyethylene is heated, it also will form a liquid hydrocarbon compounds and other compounds such as wax paraffin and olefin. Polypropylene plastic can be converted into fuel through a pyrolysis process and be continued by the process of catalytic reforming (Nugraha *et.al*, 2013). In addition for using simple pyrolysis, a catalyst that can be used is a zeolite X which can accelerate the reaction (Wahyudi *et.al*, 2015).

c. Socialization and training

Socialization and training are done three times to the people Desa Pelem, Magetan, with the materials of environmental education for the society, processing plastic waste into "BBM litik" and the practice of making "BBM litik". Socialization went smoothly and conducive. The society is very enthusiastic and the discussion goes interactively during the event because the society thinks that they are able to apply all theories and utilize plastic waste in their everyday life.



Figure 4. Socialization and training

Socialization and training are aimed to educate the public about the importance of environmental education. All stakeholders are expected to take care of institution, Human Resources (HR), facilities and infrastructure, funding, materials, communications, information, community role and methods to achieve them. This training is expected to have public awareness and the ability to keep the environment as clean and healthy. Processing of plastic waste using recycle and reduce principle is a step to preserve the environment and produce alternative fuels that are environmentally friendly.

d. The knowledge of society

After socialization and training have been done, there is an evaluation of cognitive knowledge and skills of society. The instrument that used for identifying the cognitive aspects of society in the making "BBM Litik" based on environmental education is a test contains 20 questions. Based on the score analysis, it is obtained data as Table 1 and Figure 5.

Table 1. Results of material achievement

Achievement	Amount	Percentage
Achieved	16	80%
Not achieved	4	20%
Total	20	100%

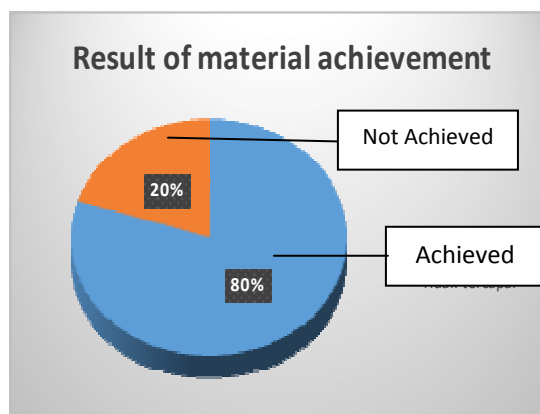


Figure 5. Result of material achievement

According to the table and diagram above, the data show that there are 16 persons who achieve scores more than 65 with a percentage of 80%. This is because at the time of delivery of material, the speaker uses clear and simple language, and people pay attention to it enthusiastically. Good delivery will bring good, effective, and efficient attainment. People who have not achieved cognitive ability and knowledge of environmental education and how to make the BBM fuel is as much as 4 people with a percentage of 20%. This inaccessibility is due to several factors including the age of the participant, cognitive ability, and enthusiasm of participants. Those 4 people are classified as non-productive age thus less enthusiastic about the activities of a theoretical nature. Based on the results of these achievements, it can generally be said that this training can improve public knowledge about environmental education and manufacturing BBM fuel from plastic waste. People who have not reached cognitively will be given additional information to strengthen cognitive skills.

In addition to cognitive aspects, the subjects are also scored by their skill in making tools and producing BBM Litik. The data from the observation sheet show that 80% of people are able to make a simple plastic processing tool for producing BBM Litik. This ability indicates that materials can be applied by the society; therefore, it can be said that people are able to apply environmental education in the changing process of garbage into useful products. How to deliver the material is also one important factor to support the skill and knowledge escalation of society in making "BBM Litik". The application model of environmental education in the community uses a participatory approach that leads to awareness and skills (Dewi, 2013)

e. The amount of plastic waste

Because of this program, the amount of plastic waste in Pelem-Magetan is reduced by approximately 50%. It can be seen from the plastic waste capacity in each family. Plastic waste before the program is only abandoned and burnt to pollute the environment. But now, after this program, the plastic waste is separated from other waste then processed collectively in each quarter to produce "BBM Litik". However, the drawback of this activity is the absence of laboratory analyzes related to the content and level of fuel from plastic. So the further studies need to develop this fuel into alternative energy.

4. CONCLUSION

The conclusion of this study are 1) The presence of tools to proceed plastic waste into "BBM Litik". 2) The presence of pyrolysis product of plastic waste into "BBM Litik". 3) The presence of public awareness for the environmental education and the processing of plastic waste into BBM Litik increases 80%. 4) Plastic waste in Desa Pelem is reduced by 50%. The suggestions for further research is the need for laboratory study of "BBM Litik" and innovative methods and the addition of a catalyst.

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**PRACTICING LESSON STUDY ACTIVITY IN BIOLOGY SUBJECT TO IMPROVE
COMMUNICATION AND COLLABORATIVE OF STUDENTS IN SMPN 18 KOTA
BENGKULU**

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Abstract : Practicing of lesson study activity on biology subject aim to improve communication and collaborative activity of students in SMPN 18 Kota Bengkulu. Involved students in this activity is 36 students. Implementation step of lesson study activity is planning, learning implementation (Do) and reflection (see) which is done in 4 open lesson. Topics learning are air pollution, 2. Soil Pollution 3. Water Pollution and Forest Pollution. The result from implementation of lesson study activity show that there is communication improvement activity and collaborative of students in biology subject in SMPN 18 Kota Bengkulu.

Key words: Lesson study, biology, communication and collaborative

1. INTRODUCTION

a. Background

At the learning process takes place students were less active in following the lessons, so students tend to be passive during the process of teaching and learning in class, it is because students are still focused on the teacher in the learning process biological being offset by teaching himself, as well as the tendency of teachers who use lecture methods in the learning process so that the lack of interest from the student. Students are not very difficult to give an opinion (communication) both in group discussions and class discussions in the learning process. During the discussions students can not cooperative each other, so the in a group tend to be dominated only certain people only. It is also revealed by Masaaki Sato (2012) that students tend to be closed, unable to listen to the opinions of others, less good at communicating with others, indifferent to others, feel inferior, and so forth. Teachers have difficulty involving all students in the learning process. According to Masaaki Sato (2012) to improve the situation as above the need for dialogue (communications) and collaborative learning through lesson study activities.

Biology subjects at SMPN 18 Bengkulu is a one of subject in science. Biology lesson topic during the learning activity is to discuss about 1) Air pollution, 2) water contamination, 3) Contamination of land, and 4) the destruction of the forests.

Based on experience and observation of the author as a Biology teacher, Biology lessons at SMPN 18 Kota Bengkulu still use conventional learning and less likely to involve the activity of students in the learning process, so that they have difficulty in understanding the biology learning materials. Students during the discussion had difficulty in speech and cooperate in a group discussion.

One effort to overcome the lack of communication and collaborative activities of the students in learning process at SMPN 18 Kota Bengkulu, is through lesson study. With the lesson study activities based on the principles of collegiality and mutual learning can build a learning community, communication learning activities students', interaction and cooperation of students, as well as the improvement of the learning process is expected to be resolved properly. At the stage of reflection (see) teachers will receive inputs from various parties who are competent, on learning that is directed at how students learn. Therefore, it is possible to improve the quality of learning both activity and student learning outcomes.

b. Problem Statement

This problem statement is "whether the implementation of the Lesson Study activities on biology lesson can improve communication and collaborative activity of students in SMPN 18 Kota Bengkulu?"

c. Theory of study

Implementation of Lesson Study in Subjects Biology

Lesson study activities have been implemented in SMPN 18 Kota Bengkulu in April to June 2015, on the course from Biology with teacher Model: Dra. Robiah, and observer: 1) Oktarita Silitonga, S.Pd 2) Kartikawati, S.Pd3) Saruni, S.Pd 4) Resti Herath, S.Pd. Students involved the 36 people who follow the course from Biology Class VII. Implementation of open lesson Consist of 4 (four) cycles. At each cycle of discussions held planning (plan), implementation in the classroom (do) and reflections from each end of the activity (see). Phase 1 namely planning (Plan), things are done is as follows. a) analyze the teaching materials which include: the depth of material, compliance with the demands of the curriculum, and the difficulty level, b) determine the learning strategies, and c) create a learning device. Phase 2: the implementation of (Do) includes the following activities. a) a brief meeting (briefing) guided by facilitator in this regard Deputy Curriculum SMPN 18 Kota Bengkulu , b) Master models put forward a brief plan (lesson plans, goals, position teaching materials in the curriculum, the estimate is likely student responses) c) The facilitator reminds the observer to not intervene in the learning process d) Observer welcome to choose wrought tstrategis according to plan observations eTeacher Model carry learning process. Phase 3See (reflection) activities carried out are as follows. a) The facilitator presents the agenda of reflection, b) The facilitator presents the rules, c) Each participant was given a chance to speak, speak based on the observation findings. d) Put focused on "how the students learning", e) Teacher models deliver both of appropriate events and not appropriate with expectations and f) The facilitator provides the opportunity observer commented

Communicative and Collaborative Learning Activities

According to Soetomo (1993) learning activities are as follows:

- 1) Visual activities: reading, pictures observations, doing experiments / demonstrations
- 2) Oral activities: storytelling, question and answer, discussion, etc.
- 3) Listening activities: listening to the teacher, friend etc.
- 4) Drawing activities: drawing, making patterns, tables, etc.
- 5) Motor activities: conducting experiments6) Mental activities: responding, troubleshoot, analyze, make decisions, etc.
- 7) Emotional activities: an interest, brave, happy, etc.

Communication Learning activities are activities oral learning to communication, which students can discuss in learning, students can provide a question and provide arguments in learning . collaborative learning activities is the students are able to work together in learning, work together in carrying out the experiment, answering questions in Students worksheet and make a report. Students also cooperate in discussions by sharing information.

2. RESEARCH METHODS

This study used a qualitative approach with case study (Yin, 2006). The research questions focused on "whether the implementation of the Lesson Study activities on biology lesson can improve communication and collaborative activities of students in SMPN 18 Kota Bengkulu ? Data obtained from the documentation implementation of activities, observation sheets, and the student's work during the implementation of Lesson Study in SMPN 18 Kota Bengkulu in April-June, 2015. Data collection technique

Data collection techniques in this study are as follows.

1. Summary of the communication Data obtained through the students' communication activities Gazette Observation filled by observer during the learning process takes place in the classroom.
2. Collaborative Activities Data obtained from the results of collaborative student Observation sheet filled by the observer during the learning takes place in the classroom.

Reflection

Reflection carried out with a discussion of reflection after the learning process. Participants in the discussion of reflection is the model teacher and observer.

3. FINDING AND DISCUSSION

a. Research Result

The results obtained through the practice of the Open Lesson lesson study and reflection in learning biology at SMPN 18 Bengkulu City is as follows.

Open Lesson 1

At an open lesson to-1 learning this topic is on Air Pollution. In the learning activities of students aired pictures of air pollution and the consequences caused by air pollution. Students discuss the causes of air pollution, as a result, and how to overcome them. At the end of the lesson students were told to create a slogan on the prevention of air pollution.

This first lesson Open communication and collaborative activity is still active in student learning. indicators:

- 1) In the discussion groups are less enthusiastic,
- 2) Discussion class is still passive,
- 3) Students at the moment discussing LDS seek answers to these questions by reading books.
- 4) Students are not able to issue its own opinion
- 5) The group presentation only read text without explaining
- 6) In class discussions, groups still tend to discuss themselves have not enthusiastic to listen or refute, approves, adding from other groups.
- 7) Students who respond are still dominant student-that's it (fixated on just one student)

Open Lesson 2

Open lesson on the 2nd of this topic is learning about Soil Pollution. In the video aired student learning activities about soil contamination and conduct experiments on the causes of pollution of soil by using soil, pesticides and earthworms. Students discuss the causes of pollution of soil, as a result, and how to overcome them. At the end of learning students were told to create a slogan or picture on the prevention of soil pollution.

Of the learning process, the open lesson this 2nd there is increased communication and collaborative student activities, is seen from Observation Data Sheet filled out by observers as follows.

indicators:

- 1) Resti herawati observed Group I and II at the time of the discussion has been quite active, but in the second group there are students who are less active (2)
- 2) Oktarita: observing group IV and V, Yensi still passively, Tri ramadan actively conducting experiments and answered questions Students worksheet. Group V: Farhan skilled in the trials, and Reza Abiyumasih confused and passive learning,
- 3) Saruni VI group generally observed the students had dared to experiment and discussion.
- 4) In a class discussion had nothing to respond positively to the results of other groups
- 5) the response to the presentation of other groups there but still lacking.

Open Lesson 3

Learning topics on the open lesson 3 is about water contamination. Students learn by experimenting with existing observing fish in jars that have been filled regular water, water mixed with detergent and pesticides. Students also discussed the results of observation, and the result of efforts to prevent water pollution.

Open lesson on the 3rd of this there is an increased activity of students in communication and collaborative pembelajaran.

indicators:

- 1) Observer Kartikawati observing a group of 6 students were active group discussions, both attempted and answered questions mainly Agnes, Nathasa, and Inaya. In class discussion has been no response from the other groups during class berdiskusi.
- 2) Observer Resti Herath observe groups of 3 and 5: Group 3 during a group discussion at the time of the experiment all the group members are quite active only one of the less active the M.Bintang. Group 5 at the time of the experiment was very excited but at the time of presentation somewhat less enthusiasm.
- 3) Observer Oktarita Silitonga observing groups 1 and 2. Group 1 all group members are active in the discussion. Group 2 includes the groups most good and skilled and active in the classroom.
- 4) Student learning activities in general is increasing, and increasingly active group discussions.

Open Lesson 4

Open lesson on the 4th to the topic of learning about forest damage, learning activities is by showing a video and pictures of the destruction of forests. Students discuss the causes, consequences and prevention of forest destruction.

Improved communication and collaborative learning activities of students in the better.

indicators:

- 1) Observer Kartikawati observing groups 2 and 3 Presentation of the group is good enough, the existing Group 2 presentation is quite nice not too read, so many have responded to the group presentations such as a group 2, group 3 also responded
- 2) Observer Resti Herath observing groups 5 and 6 students actively pay attention to the video content and record the things that are important, with the use of video students are interested in (interests) Group 5 and 6 are already active in group discussions and class.
- 3) Observer Saruni observe groups of four during the discussion groups of students actively discuss the issues / problems that exist in the LDS
- 4) Observer Oktarita Silitonga observing group 1 and group discussion class goes well, each group renders No comments / additions of other groups

b. Discussion

Application of lesson study activities at study Biology at SMPN 18 Kota Bengkulu can improve communication and collaborative learning activities of students, it can be seen in the learning process of students more active in every open lesson and can answer the questions that exist in communication and learning LDS. Activity collaborative students ranging from open lesson 1, to open lesson 4 increased student learning activities, for example, the response of participants when the discussion took place in the open lesson first is not visible, on the open lesson two activities class discussions are already active and to respond positively to the results of other groups, on the open third lesson learning activities of students is increasing, as well as group discussions increasingly active. Open fourth lesson the students had dared to give a rebuttal / response regarding the issues presented another group.

Students are used in the study group either in providing information or provide feedback during class discussions. Lesson study is able to improve the communication and cooperation of the students in learning. According to Masaaki (2012) lesson study is able to improve dialogue and collaboration in learning. Lesson study in teaching can also give attention to think to solve the problem, in collaboration

with other parties, implementing activities and share expression (expression and sharing). Additionally, Hamalik (2010), also states that learning provides learning opportunities for students themselves, working through their activities memperoleh knowledge and understanding of aspects of the behavior of others. If the preferred learning activities in learning, so that students' learning is the basis for achieving the objectives and learning outcomes more adequate. Lesson Study is always focused on how to make students learn. Lesson Study focuses on improving that can be directly utilized in the given context. Each learning activity is a unit that harus dianalisis and improved so that repairs can be directly referred diterapkan. Lesson Study is a collaboration. By collaborating directly with each other that teachers can exchange ideas and give inputs to improve the quality of learning.

Lesson study, which stresses teamwork, either small group or class, students listen to each other to make more friends, so that students better understand the subject matter. Students ask questions, listen, accept other people's opinions, which is done when the discussion will be able to develop a cognitive understanding is getting better. With frequent students in conducting group discussions will foster independence in learning. According Johson (2009), that the cooperation within the group can eliminate mental barriers due to limited experience. Collaboration and dialogue that occurred in the group will be able to eliminate the existing shortcomings in students, such as the fearfully issued his opinion. According to (Manabu Sato, 2014) lesson study that emphasizes collaborative learning can improve students' low academic ability, and also ensures high academic ability of students better. Apriani (no year) carried out based learning lesson study said that from the beginning of the learning students can understand the material well, there was an increase learning outcomes of students.

4. CONCLUSIONS

a. Conclusion

The conclusions derived from activities in the implementation of Lesson Study Biology lesson at SMPN 18 Kota Bengkulu as follows: Improvement in communication and collaborative learning activities of students in the lecture

b. Suggestions

Suggestions from this activity as follows: a. Need to be followed up for the next stage which is more involving all parties in the Ministry of Education and at school. b. Before the lesson study activities started at the beginning of the semester already there should be a separate meeting to discuss how the schedule, the model teacher and the observer, so that when the learning has begun is no longer a problem either schedule or the model teacher and observer.

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**THE IMPROVEMENT OF STUDENT'S CONVERSATION ACTIVENESS
THROUGH IMPLEMENTATION OF JIGSAW COOPERATIVE LEARNING
PENINGKATAN KEAKTIFAN PEMBICARAAN MAHASISWA MELALUI
PENERAPAN MODEL BELAJAR KOOPERATIF TIPE JIGSAW**

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ABSTRACT

: This study is a Classroom Action Research (CAR) which the subject is 4th semester students in A class of Primary School Teacher Education (PGSD) in University of Muhammadiyah Gresik. The purpose of this study is to determine whether the model of jigsaw cooperative learning can enhance the activity of students of Primary School Teacher Education (PGSD) University of Muhammadiyah Gresik (UMG). This research carries out three cycles and focus on students' conversation activeness. The research design; first reflection → first action plan → first implementation and observation → first reflection and evaluation → second action plan → second implementation and observation → second reflection and evaluation → third action → third implementation and observation → third reflection and evaluation. The results showed that the level of students' activity has increased in each cycle about asking activeness, answering questions activeness, students' expressing activeness, and the duration of presentation has been increased too. And for students' dependence on their note during presentation has been decreased. The result of the study proves that that the model of jigsaw cooperative learning can enhance the activity of the students' conversation activeness.

Keywords

: Activeness conversation, cooperative learning, jigsaw model

1. INTRODUCTION

The world of education has now evolved and changed. There was something new with regard to the learning and teaching. Lecturers are required to improve themselves by following these developments. Lecturers must master the new curriculum, new teaching methods and new assessment techniques. There are three great ideas for learning practices that this is often forgotten teacher, the active involvement of students, student learning as an individual and social, and to make a difference as an asset not an obstacle learner who needs to be contradicted (Wilson and Peterson, 2006).

Wilson and Peterson (2006) further added that now there has been a change in the paradigm of learning. Previously, students are often considered empty beings that have no knowledge; hence they are treated as a passive observer. Now the paradigm has changed, the student is not being empty with no content, they have the potential they were born. Therefore, the learning process must involve them, engage and enroll them. Lecturer is not a major source of learning. The role of the lecturer is now over to the supervisor, facilitator, and advisor. When the first student must sit quietly and actively listen to the lecturers are now different, it is a good learning activity involved students, argue, answering and asking questions, and try and practice in the field.

Perseverance and liveliness of student influence on learning success, students' background knowledge and their motivation. Unsurprisingly that now many experts are trying to find out how to improve the persistence and activeness in learning activity.

This phenomenon should not be allowed, there should be an effort to make students more active when learning. Therefore lecturer of the course Teaching and Learning will hold a class action by applying the model of cooperative learning jigsaw. Through this model, students are expected to be more active in learning because of the activity leads to successful learning. Secondly, that the classroom atmosphere more lively, dynamic and the learning process is not tedious. Dynamics and classroom atmosphere which life is a mirror of the activity and the learning success is largely determined by the activity.

The purpose of this research is to increase students' conversation activeness of A Class in Primary School Teacher Education (PGSD) of Muhammadiyah Gresik University. In particular goal of this research is that students want to ask, argue, and responding to the problems presented to him. In addition, students are expected to skillfully convey his idea through a good presentation.

Utomo and Ruijter (1994) states that to enable students, lecturers are required to be more varied in teaching. Active learning by involving students will produce a better understanding and matter remembered longer. Activeness of students in learning is influenced by two factors: internal and external factors. Internal factors concerning interest, motivation and level of intelligence, while external factors concerning the family, the environment, and education.

Based on the survey in class A Prodi PGSD 4th semester was found that at the moment looks less eager student learning. There were four students late for class because it claims to be from the cafeteria, five students were whispering when no presentation and three other students do not pay attention. In mid course no two students drowsy and when professors give students the opportunity to ask nobody asks.

2. RESEARCH METHODS

The study design was: initial reflection → action plan 1 → implementation and observation 1 → reflection and evaluation 1 → plan of action 2 → implementation and observation → reflection and evaluation 2 → planning action 3 → implementation and observation 3 → reflections and evaluation 3.

a. planning actions

Before carrying out the actions, researchers define and formulate a few things. a) Identify the problem, which was to determine the problem with the students during the learning or learning problems during the previous cycle. b) Scenario learning actions, which outlined the steps that will be used as a guide in implementing the action. c) The tools used are decisive tool to be used in carrying out the action and at the same observation tool.

b. Implementation of the act of learning.

Implementation of measures in this study is the use of cooperative learning model jigsaw. Step actions include: delivery of learning objectives, motivation, and submit a concept map material. Furthermore, students form groups, each group is a mix of students who heterogenic, good race, ethnicity or religion, and level of intelligence. Each group discussed and point out who the unity, the second to the fifth. Lecturer then divides the material into several sub-topics. Material sub discussion 1 becomes the responsibility of unity; the material sub discussion 2 becomes the responsibility of the second, and so on. Members of the group of people gathered by the unity of unity, the two get together with a second person, and this is called the expert group. The expert groups read and discuss the material to the responsibilities, as well as other groups. Once the group of experts completed their discussion then back to the group home and present the results in turn. At the same time all the activity observed and documented by observers as a reflection and evaluation.

c. Plans recording

In implementation of the action, the atmosphere of the class, the lecturer activity, response, and student behavior will be recorded. To facilitate the recording of researchers prepared a form with columns and specific codification. It is intended that the result of the recording can be coherent, focused and interrelated. Recording activity in addition to using stationery is using a digital camera.

d. Data analysis

All data observation, learning environment, the response and behavior of students, especially with regard to the conversation activity will be analyzed. The analysis model is using Mils and Huber men. The analysis model includes three activities simultaneously: (1) data reduction, (2) presentation of data, and (3) conclusion / verification.

e. Reflection

After the data have been analyzed, the results will be used for reflection. Reflection is done at the end of each cycle. Besides addressing the shortage of reflection also discuss implementation of the action all stages in the research process. The results will be used as material for the reflection of the improvement in the preparation of an action plan in the next cycle.

3. RESULTS AND DISCUSSION

CYCLE 1

Learning gains in the first cycle is the students get to know the concept of learning theory behaviorist. The indicators are; able to explain the definition, analyzing concepts, and are able to scrutinize the strengths and lacks. Therefore learning model used is a model of cooperative jigsaw, then learning activities start early activities, core activities, and activities cover using the syntax of the learning model.

The first cycle of the actions carried out Monday, 25th April 2016 at 12:30 p.m. to 2:30 p.m. in room microteaching.

The result is the new twenty active students asked, nineteen active answered, and eleven states their idea. This means there are four students have not used the opportunity to ask, five students did not use the opportunity to answer questions, and thirteen other passive or no opinion at all. In the home group discussions average student gave a presentation during the 4.1 minutes. When a group of five people, then the average per group using the presentation time

during 20.5 minutes. If the original group discussion is provided within 35 minutes means that only 57% utilized, while the rest has not been utilized. The above data also shows that the level of dependence of students to books, reference, resume records still high, only two students who are not dependent on the books and records resume, fourteen more times depending, and eight people are still very dependent.

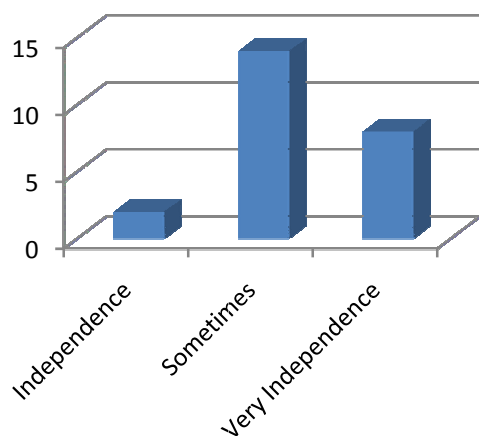


Figure 4.1 the level of students' activeness in cycle 1

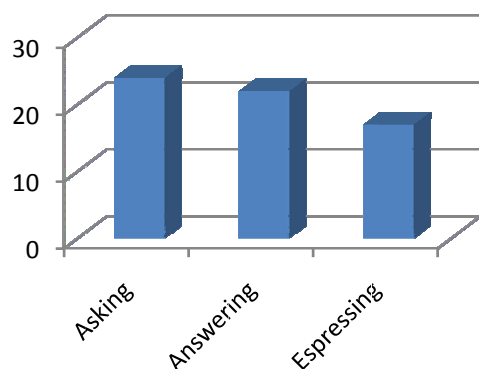


Figure 4.1 the level of students' dependence on their notes cycle 1

CYCLE 2

The material of the second cycle is the theory of cognitive learning, the learning achievements of students familiar with concepts and cognitive learning theory. The indicator are able to explain the definition, analyzing concepts, and able to scrutinize the strengths and lacks. Therefore learning model used is a model of cooperative jigsaw, then learning activities start early activities, core activities, and activities cover using the syntax of the learning model. Details of the learning scenarios are generally the same as the previous cycle only with an improvement of the results of the first cycle of reflection.

Cycle 2 held on Monday, 25th April 2016 at 12:30 p.m. to 2:30 p.m.

As the first cycle, the researchers focused on the observation of the student discussion group of experts and group discussions origin. The consideration for the two sessions students have opportunity to talk, discuss, ask questions, and express opinions is wide open.

The result in the second cycle is already 24 students who actively ask, 22, answered questions, and seventeen give revelation. This means there is still one student who has not used the opportunity to ask three students did not use the opportunity to answer questions, and eight people remain passive or no opinion at all. Meanwhile in group discussions average origin students made a presentation during the 4.2 minutes. When a group of five people, then the average per group using the presentation time for 21 minutes. If the original group discussion is provided within 35 minutes means that only 60% of the time is used, while the rest have not. When students presented in their group of students to the level of dependence on books, references, some not of resume has begun to diminish. Already five students who are not dependent on textbooks, fifteen times depending, and the other five are still very dependent.

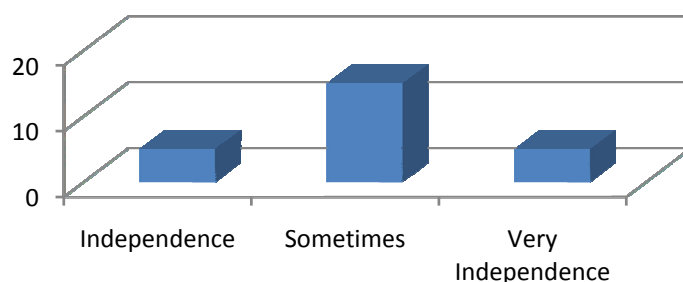


Figure 4.1 the level of students' activeness in cycle 2

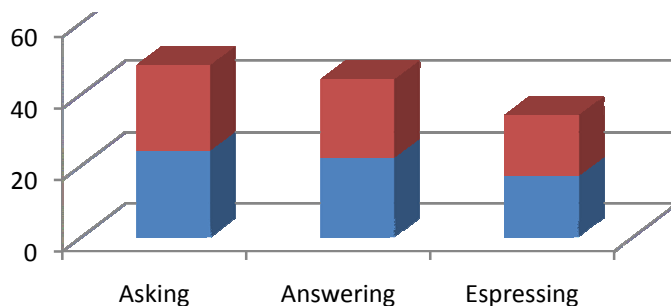


Figure 4.1 the level of students' activeness in cycle 2

CYCLE 3

The materials in third cycle are; the kinds of learning strategies. These materials includes a repeat learning strategies, learning strategies underline, learning strategies side note, the elaboration of learning strategies, and learning strategies analogy. Learning gains are the third cycle students get to know some of the concepts of learning strategies. The indicators are able to explain the definition, analyzing the concept and implementation of the various types of learning strategies in the classroom.

The third cycle held on Monday, 2nd of May 2016 at 12:30 p.m. to 2:30 p.m.

The result is the third cycle there are still students who have not been active, even though all of the students had used the opportunity to ask. There were three students did not use the opportunity to answer questions friends and five remain passive or no opinion at all. Being in a group discussion origin of the average student in delivering the presentation has risen for 4.5 minutes. When there are five students in a group, then the average per group using the presentation time could reach 22.6 minutes. If the original group discussion is provided within 35 minutes means that already 65% of the time is used, while the rest has not been utilized.

When students presented in their group of students to the level of dependence on books, references, some not of resume than in second cycle has been reduced. Already nine students who are not dependent on textbooks, thirteen other times depending, and three people are still very dependent.

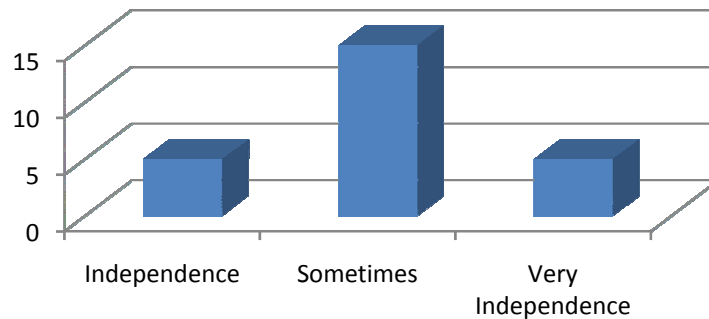


Figure 4.1 the level of students' activeness in cycle 2

After considering the data above, are not all active students in both the expert group and the original group. However, when the data first cycle, second, and third juxtaposed is looked continued improvement in the students the courage to ask, answer, and express ideas or thoughts. Also their capabilities in presentation at their group, terms of time continues to increase, also the level of reliance on the books and records are increasingly reduced. This shows that by applying the model of cooperative learning jigsaw able to enhance the activity of student speech in learning.

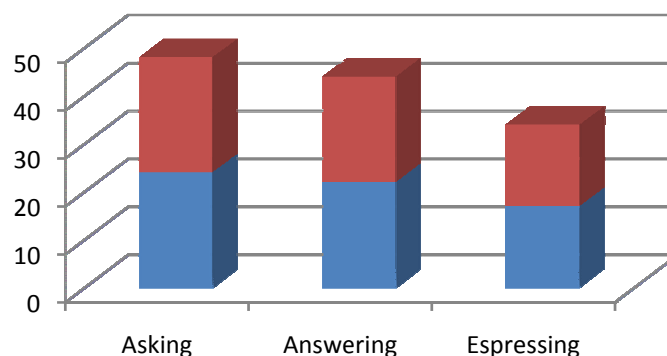


Figure 4.1 the level of students' activeness in cycle 3

DISCUSSION

The results of this study are consistent with previous studies (Qiao and Jin, 2010) states that the jigsaw cooperative learning techniques are effective ways to promote the participation and enthusiasm of learners. This technique can help learners accomplish the tasks of learning, learning atmosphere enable more interdependent and independent. The reluctance of students to participate to be reduced, students enjoy and want to participate in learning activities. Reading, take notes and discuss help learners to form their own opinion for the better. Learners enjoy learning because not only hear the voice of the instructor but also the voice of the other. Their students learn the material by heart because it is expected to teach someone else.

Azmin (2016) stated the same thing that learners enjoy learning with this model. Student achievement by using this method increased more significantly after the intervention.

This method helps students perform better, students benefit and can develop their social skill although this method is also not a perfect teaching tool.

Model approach to learning not only increase student interest but also improves the effectiveness of learning. With increased interest in learning that will lead to better learning outcomes. Competition and positive interactions among students can improve their intent to learn, especially when associated premises information technology devices and the Internet, learning will be more meaningful and interesting (Huang, Liao, YW, Y, M, Huang, SH, and Chen, HC (2014). the model of learning requires students to the level of achievement and potential range can be mutually discuss and cooperate resulting increase in achievement and participation. Average Joel M., Moskowitz, Janet H., Malvin., Gary A., Scaeffler, and Eric Scaphs (1985) states this model is intended for academic and social competence development of students. This creates a learning model of cooperation between them and the arrangement of interdependence among students through the learning task.

Motivation has an important role in learning. Gardner and Lambert (1972) stated that motivation has an important role in the success of student learning. Motivation is defined as a pretext to achieve the goal. While Brown (1981) defined, it as encouragement from within as well as the desire that drives someone to do something. In general, there are two kinds of motivation intrinsic and extrinsic motivation. Intrinsic motivation is the desire of a person to achieve the goal being extrinsic motivation boost that comes from outside.

4. CONCLUSION

1. Using the three cycles, the model of cooperative learning jigsaw has a positive influence on the activity of student speech in asking, answering questions, and convey an idea / notion. Another influence is the students have been able to increase the quantity of talks in the presentation and reducing dependence on textbooks, references, or note his resume during a presentation. All of the above points is needed, especially to create independent learning groups are more qualified. The results showed that the activity of students has raised talks evidenced by the increasing number of students who ask, answer questions, and provide feedback.
2. Thus, this research concludes that the type cooperative learning model jigsaw can enhance the activity of student speech.

A. Suggestions

Based on the results of the study, the researchers wanted to give the following advice:

1. For students, it should be capable of self-motivation to learn because of the motivation plays an important role in the learning process. Students are expected to not be afraid of, not ashamed of the opinion, convey ideas, ideas, and what he was thinking at the heart of their community tengah, also should keep trying and practicing many times to really succeed
2. For the lecturer / researcher should guide and accompany the group which is still less active.
3. Target the material to be read, studied and mastered the students should focus and clear because the material is very extensive.
4. For lecturers / researchers should make the rules argued that the expert group discussions and home group is not dominated by most students only.
5. The lecturers are expected to guide students personally because of their potential differently.

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UPAYA PENINGKATAN AKTIVITAS DAN HASIL BELAJAR DENGAN MODEL PEMBELAJARAN KOOPERATIF BERBANTUAN PENILAIAN PORTOFOLIO MELALUI LESSON STUDY BERMUATAN NILAI KEARIFAN LOKAL DAN ENTREPRENEURSHIP PADA MATA KULIAH PRAKTIKUM ASESMEN PSIKOLOGI TEKNIK TES DI MAHASISWA SEMESTER VI JURUSAN BK FIP UNDIKSHA

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Abstrak :Tujuan penelitian ini adalah untuk mengetahui keberhasilan *Model Pembelajaran Kooperatif dengan berbantuan penilaian portofolio* dalam kaitannya untuk meningkatkan keterampilan mahasiswa dalam membuat dan menggunakan Asesmen Psikologi Teknik Tes pada mata kuliah Praktikum Asesmen Psikologi Teknik Tes di semester VI Jurusan Bimbingan Konseling FIP UNDIKSHA. Jenis Penelitian yang akan dilaksanakan dalam penelitian ini adalah penelitian tindakan kelas atau *class room action research*. Penelitian ini rencananya akan dilaksanakan dalam dua siklus. Tiap siklus terdiri atas empat tahap yakni perencanaan, tindakan, observasi/evaluasi dan refleksi. Subjek penelitian ini adalah mahasiswa semester VI yang mengikuti perkuliahan Praktikum Asesmen Psikologi Teknik Tes pada semester genap sebanyak 52 orang. Jenis data yang dikumpulkan dalam penelitian ini yaitu data aktivitas dan hasil belajar dalam mata kuliah Praktikum Asesmen Psikologi Teknik Tes. Berdasarkan jenis data yang dikumpulkan, maka sumber datanya adalah mahasiswa, dalam hal ini adalah mahasiswa semester VI yang mengikuti kuliah Praktikum Asesmen Psikologi Teknik Tes sebanyak 52 orang. Instrumen yang digunakan dalam mengumpulkan data aktivitas dan hasil belajar dalam penelitian ini adalah berupa pedoman observasi yang menggunakan rubrik penilaian. Metode analisis data yang digunakan dalam penelitian ini adalah analisis deskriptif kuantitatif dengan teknik persentase. Hasil pengukuran terhadap peningkatan aktivitas dan hasil belajar dalam mata kuliah Praktikum Asesmen Psikologi Teknik Tes dihitung rata-ratanya kemudian dipersentasekan, selanjutnya persentase tersebut dibandingkan dengan kriteria keberhasilan yang diinginkan dalam penelitian.

Kata-kata kunci : *Model Pembelajaran Kooperatif dengan berbantuan penilaian portofolio, Asesmen Psikologi Teknik Tes, Lesson Study*

1. PENDAHULUAN

Konselor dalam sistem pendidikan nasional dinyatakan sebagai salah satu kualifikasi pendidik, sejajar dengan kualifikasi guru, dosen, pamong belajar, tutor, widyaiswara, fasilitator, dan instruktur (UU No. 20 Tahun 2003 Pasal 1 Ayat 6). Kesejajaran posisi ini tidaklah berarti bahwa semua tenaga pendidik itu tanpa keunikan konteks tugas dan ekspektasi kinerja. Demikian juga konselor memiliki keunikan konteks tugas dan ekspektasi kinerja yang tidak persis sama dengan guru. Hal ini mengandung implikasi bahwa untuk masing-masing kualifikasi pendidik, termasuk konselor, memerlukan upaya pembentukan kualifikasi akademik dan kompetensi berdasar kepada konteks tugas dan ekspektasi kinerja masing-masing. Peraturan Menteri Pendidikan Nasional No 27 Th. 2008 tentang Standar Kualifikasi Akademik dan Kompetensi Konselor (Pasal 1) secara tegas menyebutkan bahwa untuk dapat diangkat sebagai konselor, seorang wajib memenuhi standar kualifikasi akademik dan kompetensi konselor yang berlaku secara nasional. Selanjutnya penyelenggara pendidikan yang satuan pendidikannya memperkerjakan konselor wajib menerapkan standar kualifikasi akademik dan kompetensi konselor.

Jurusan Bimbingan Konseling FIP Undiksha sebagai lembaga pendidikan yang mencetak calon konselor dituntut untuk menyelenggarakan pendidikan bagi mahasiswa calon konselor (khususnya konselor sekolah) yang sesuai dengan tuntutan kualifikasi akademik dan kompetensi berdasar kepada konteks tugas dan ekspektasi kinerja konselor sekolah. Sehingga dapat menghasilkan konselor yang kompeten dalam mengampu tugas dan menunjukkan kinerja profesional sesuai tuntutan profesi setelah mereka menyelesaikan studinya.

Penguasaan keterampilan konseling bagi konselor memungkinkan terselenggaranya pelayanan konseling yang professional dan memandirikan serta menghindarkan tercederainya praktik profesi konselor. Sehingga demikian, penguasaan keterampilan konseling bagi mahasiswa calon konselor hendaknya merupakan salah satu syarat utama yang harus dipenuhi sebelum mereka dinyatakan lulus dalam studinya. Perancangan kurikulum (khususnya di jurusan BK) dalam pengelompokannya pada elemen-elemen kompetensi, diberikan berbagai pengalaman belajar yang terkait dengan kompetensi utama, seperti; teknik pemberian informasi dan bimbingan, berbagai teknik konseling, teknik-teknik pemahaman individu, psikometrika (yang terkait dengan pengukuran kemampuan dan trait) beserta penafsirannya, serta berbagai pemahaman tentang multikultural. Pencapaian kompetensi tersebut dalam pelaksanaan pengalaman belajar didukung dengan kompetensi penunjang maupun kompetensi lain.

Mata Kuliah Praktikum Asesmen Psikologi Teknik Tes merupakan salah satu mata kuliah inti yang wajib diikuti oleh mahasiswa BK FIP undiksha. Salah satu tujuan dari mata kuliah tersebut agar dikuasainya keterampilan dalam menyajikan dan menggunakan hasil Asesmen Psikologi Teknik Tes sebagai penunjang dalam melaksanakan layanan BK disekolah. Praktikum Asesmen Psikologi Teknik Tes diberikan sebagai pengalaman belajar pada mahasiswa BK, diformulasikan dalam kompetensi penunjang, dan dijabarkan dalam elemen kompetensi keterampilan keilmuan (MKK). Hal ini ditampilkan dengan logika, bahwa : MKK adalah merupakan kelompok bahan kajian dan pelajaran yang ditujukan terutama untuk memberi landasan penguasaan ilmu dan ketrampilan tertentu.

Kemampuan menggunakan dan mengoperasionalkan Asesmen Psikologi Teknik Tes dalam bimbingan dan konseling merupakan salah satu kompetensi dasar yang harus dikuasai oleh konselor, karena dalam kegiatannya seorang konselor hendaknya mampu merancang, menggunakan, dan mengevaluasi efektivitas penggunaan Asesmen Psikologi Teknik Tes dalam pelayanan bimbingan dan konseling. Melalui perencanaan yang baik akan memperoleh kejelasan arah penggunaan Asesmen Psikologi Teknik Tes dalam bimbingan dan konseling dan memudahkan untuk memeberikan layanan peminatan.

Berdasarkan studi pengawalan pada perkuliahan Praktikum Asesmen Psikologi Teknik Tes yang diikuti mahasiswa semester VI menunjukkan bahwa terjadi pendangkalan pemahaman dan penguasaan mahasiswa terhadap Aktivitas dan Hasil Belajar, dari 52 orang mahasiswa yang mengambil mata kuliah tersebut 75% (24 orang) mahasiswa mengatakan belum memahami dan belum mampu untuk menginternalisasi Aktivitas dan Hasil Belajar kedalam pelaksanaan layanan bimbingan konseling, temuan ini juga diperkuat hasil wawancara dengan kelompok mahasiswa semester VIII yang telah lulus dalam mata kuliah tersebut dan sedang mengikuti praktik magang Bimbingan konseling (*intrehensif BK*) di sekolah. Hasil wawancara menunjukkan mereka belum mampu menyusun rencana pengimplementasian penggunaan Praktikum Asesmen Psikologi Teknik Tes yang tepat dalam melaksanakan kegiatan layanan bimbingan konseling berdasarkan kebutuhan siswa dan masalah siswa baik itu dalam bidang pribadi, belajar, sosial dan karir.

Dari permasalahan di atas, diperlukan adanya metode, model, teknik dalam perkuliahan yang mampu membantu mahasiswa calon konselor untuk menguasai Asesmen Psikologi Teknik Tes dengan lebih optimal. Sehubungan dengan itu, karena pemantauan meliputi proses maupun hasil, maka diperlukan suatu model pembelajaran yang terpadu antara kegiatan belajar mengajar dengan asesmen yang digunakan, dimana dalam asesmen yang dilakukan tersebut harus terdapat suatu umpan balik yang efektif, baik efektif dalam arti mengoptimalkan hasil maupun efektif dalam arti membangun tanggungjawab belajar pada diri mahasiswa.oleh karena itu dalam penelitian ini akan digunakan *Model Pembelajaran Kooperatif dengan berbantuan penilaian portofolio*.

Penilaian portofolio adalah penilaian berdasarkan hasil pengamatan penilai terhadap aktivitas siswa sebagaimana yang terjadi. Penilaian dilakukan terhadap unjuk kerja, tingkah laku, atau interaksi mahasiswa. *Penilaian portofolio* digunakan untuk menilai kemampuan mahasiswa melalui penugasan. Penugasan tersebut dirancang khusus untuk menghasilkan respon (lisan atau tulis), menghasilkan karya (produk), atau menunjukkan penerapan pengetahuan. Tugas yang diberikan kepada mahasiswa harus sesuai dengan kompetensi yang ingin dicapai dan bermakna bagi mereka (Setyono,2005:3). Sedangkan

menurut Majid (2006:88) *penilaian portofolio* merupakan penilaian dengan berbagai macam tugas dan situasi di mana peserta diminta untuk mendemonstrasikan pemahaman dan mengaplikasikan pengetahuan yang mendalam, serta keterampilan di dalam berbagai macam konteks. Jadi dapat dikatakan bahwa *penilaian portofolio* adalah suatu penilaian yang meminta peserta untuk mendemonstrasikan dan mengaplikasikan pengetahuan ke dalam berbagai macam konteks sesuai dengan kriteria-kriteria yang diinginkan. Berdasarkan kedua pendapat tersebut dapat disimpulkan bahwa *penilaian portofolio* dalam penelitian ini adalah suatu bentuk penilaian untuk mendemonstrasikan atau mengaplikasikan pengetahuan yang telah diperoleh oleh mahasiswa dan menggambarkan suatu kemampuan mahasiswa melalui suatu proses, kegiatan, atau unjuk kerja.

Karakteristik *Model Pembelajaran Kooperatif* menurut Norman (dalam Siti Mahmudah, 2000:18) adalah (1) tugas-tugas yang diberikan lebih realistis atau nyata; (2) tugas-tugas yang diberikan lebih kompleks sehingga mendorong siswa untuk berpikir dan ada kemungkinan mempunyai solusi yang banyak; (3) waktu yang diberikan untuk asesmen lebih banyak; (4) dalam penilaiannya lebih banyak menggunakan pertimbangan. Hal senada juga diungkapkan oleh Setyono (2005:3) bahwa *Model Pembelajaran Kooperatif* digunakan untuk menilai kemampuan siswa melalui penugasan yang berupa aspek pembelajaran kinerja dan produk, sedangkan Hutabarat (2004:16) berpendapat bahwa *Model Pembelajaran Kooperatif* lebih tepat untuk menilai kemampuan siswa dalam menyajikan lisan, pemecahan masalah dalam suatu kelompok, partisipasi siswa dalam suatu kegiatan pembelajaran, kemampuan siswa dalam menggunakan peralatan laboratorium serta kemampuan siswa mengoperasikan suatu alat.

Pada penelitian tindakan ini, implementasi *Model Pembelajaran Kooperatif dengan berbantuan penilaian portofolio* pada perkuliahan Praktikum Asesmen Psikologi Teknik Tes dilaksanakan dengan mengajak mahasiswa untuk secara langsung merancang dan melaksanakan kegiatan praktek Praktikum Asesmen Psikologi Teknik Tes. Kolaborasi yang dilaksanakan adalah berorientasi pada kegiatan *lesson study* yang terdiri dari tiga tahapan yaitu tahap *plan*, *do*, dan *see*. **Tahapan *plan*** mahasiswa yang terbentuk dalam kelompok bersama tim dosen pengampu mata kuliah merancang rencana pengimplementasian Praktikum Asesmen Psikologi Teknik Tes dalam pelaksanaan layanan bimbingan konseling berdasarkan kebutuhan dan/atau permasalahan nyata yang dialami siswa di sekolah. Selanjutnya, pada **tahap *do*** mahasiswa melaksanakan atau mengimplementasikan rencana kegiatan menyajikan dan menggunakan hasil Asesmen Psikologi Teknik Tes bersama kelompok dimana dalam hal ini mahasiswa akan berperan menjadi konselor. Pada tahap *do* ini mahasiswa peserta kuliah lainnya bersama tim dosen pengampu mata kuliah terlibat menjadi observer yang bertugas mengobservasi pelaksanaan kegiatan menyajikan dan menggunakan hasil Asesmen Psikologi Teknik Tes. Selanjutnya pada **tahap *see***, dilaksanakan diskusi kolaborasi tentang proses dan hasil kegiatan menyajikan dan menggunakan hasil Asesmen Psikologi Teknik Tes yang telah dilaksanakan. Berdasarkan uraian di atas, maka Implementasi *Model Pembelajaran Kooperatif dengan berbantuan penilaian portofolio* berorientasi *Lesson Study* diprediksikan akan dapat meningkatkan Aktivitas dan Hasil Belajar pada mahasiswa semester VI dalam mata kuliah Praktikum Asesmen Psikologi Teknik Tes Jurusan BK FIP Undiksha

2. METODE PENELITIAN

Setting Penelitian : Penelitian ini dilaksanakan di Jurusan Bimbingan Konseling FIP Undiksha yang berlokasi di Kampus tengah Gedung FIP Undiksha Singaraja. **Subjek dan Objek Penelitian** : Kelompok sasaran yang menjadi subjek penelitian adalah mahasiswa semester VI Jurusan BK FIP Undiksha yang mengambil mata kuliah praktikum asesmen psikologi teknik tes Jumlah mahasiswa subjek penelitian adalah 52 orang mahasiswa. Selanjutnya objek penelitian ini adalah aktivitas dan hasil belajar dalam mata kuliah praktikum asesmen psikologi teknik tes yang akan ditingkatkan melalui implementasi *Model Pembelajaran Kooperatif dengan berbantuan penilaian portofolio*. **Sumber data** : Jenis data yang dikumpulkan dalam penelitian ini yaitu data mengenai aktivitas dan hasil belajar dalam mata kuliah praktikum asesmen psikologi teknik tes. Berdasarkan jenis data yang dikumpulkan, maka sumber datanya adalah mahasiswa, dalam hal ini adalah mahasiswa semester VI yang mengikuti kuliah praktikum

asesmen psikologi teknik tes sebanyak 52 orang. **Jenis Penelitian:** Jenis Penelitian yang akan dilaksanakan dalam penelitian ini adalah penelitian tindakan kelas atau *class room action research*. Penelitian ini rencananya akan dilaksanakan dalam dua siklus. Tiap siklus terdiri atas empat tahap yakni perencanaan, tindakan, observasi/evaluasi dan refleksi. **Instrumen Penelitian:** Instrumen yang digunakan dalam mengumpulkan data peningkatan keterampilan membuat dan menggunakan praktikum asesmen psikologi teknik tes adalah berupa panduan observasi yang dibuat berdasarkan empat keterampilan yang ingin dilihat dari mahasiswa, keempat keterampilan tersebut nantinya akan diukur dengan menggunakan rubrik. Keempat keterampilan yang dimaksud adalah sebagai berikut: a). Keterampilan merencanakan pemilihan media, b). Keterampilan membuat dan menggunakan naskah praktikum asesmen psikologi teknik tes yang disesuaikan dengan tujuan dan juga sasaran dari pelaksanaan layanan BK c) Keterampilan membuat dan menggunakan praktikum asesmen psikologi teknik tes sesuai dengan perencanaan dan juga naskah yang telah dibuat d) Keterampilan menggunakan praktikum asesmen psikologi teknik tes dengan cara mempresentasikan praktikum asesmen psikologi teknik tes yang telah dibuat

Prosedur Analisis Data dan Kriteria Keberhasilan: Metode analisis data yang utama digunakan dalam penelitian ini adalah analisis deskriptif kuantitatif dengan teknik persentase. Namun selain itu, untuk melihat proses pelaksanaan praktik, data-data penelitian ini juga berupa data naratif tentang proses dari pelaksanaan perkuliahan. Data kualitatif berupa naratif proses pelaksanaan perkuliahan praktikum asesmen psikologi teknik tes ini juga akan mendukung data kuantitatif dalam menentukan keberhasilan tindakan. Secara kuantitatif, hasil pengukuran terhadap hasil belajar mahasiswa berupa keterampilan membuat dan menggunakan praktikum asesmen psikologi teknik tes dihitung rata-ratanya kemudian dipersentasekan, selanjutnya persentase tersebut dibandingkan dengan kriteria keberhasilan yang diinginkan dalam penelitian. Cara untuk mencari rata-rata, dapat dirumuskan sebagai berikut: Secara kuantitatif, hasil pengukuran terhadap hasil belajar mahasiswa berupa keterampilan komunikasi interpersonal dihitung rata-ratanya kemudian dipersentasekan, selanjutnya persentase tersebut dibandingkan dengan kriteria keberhasilan yang diinginkan dalam penelitian. Untuk mengetahui persentase peningkatan keterampilan praktikum asesmen psikologi teknik tes, maka dilakukan analisis deskriptif yaitu analisis dengan membandingkan persentase yang dicapai sebelum dan sesudah diadakan tindakan.

3. HASIL PENELITIAN DAN PEMBAHASAN

Hasil Penelitian: Bab ini menyajikan data hasil analisis terdiri dari 4 sub bahasan yaitu deskripsi awal sebelum tindakan dengan menggunakan *Model Pembelajaran Kooperatif dengan berbantuan penilaian portofolio*, deskripsi dan hasil penelitian siklus I, deskripsi dan hasil penelitian siklus II, dan Pembahasan hasil penelitian. **Deskripsi Awal** Penelitian ini digandengkan dengan mata kuliah praktikum asesmen psikologi teknik tes, dalam penelitian ini dosen pengajar sekaligus bertindak sebagai peneliti, sebenarnya pertemuan perkuliahan praktikum asesmen psikologi teknik tes sebanyak 16 kali, namun penelitian ini dimulai dari pertemuan ke tujuh, karena untuk pertemuan satu sampai dengan enam masih diawali dengan pemberian materi mengenai konsep praktikum asesmen psikologi teknik tes, untuk selanjutnya maka proses perkuliahan didasarkan pada *penilaian portofolio* sesuai dengan tujuan penelitian. Penelitian ini terdiri dari tiga siklus dimana masing-masing siklus terdiri dari tiga kali pertemuan. Subjek penelitian adalah seluruh mahasiswa yang mengambil mata kuliah praktikum asesmen psikologi teknik tes sebanyak 52 orang. Dalam penelitian ini assesment yang digunakan adalah penilaian portofolio kelompok dimana dalam hal ini tujuannya adalah untuk mengakses kinerja mahasiswa secara kelompok, dari 52 orang mahasiswa mereka dibagi menjadi delapan kelompok dimana masing-masing kelompok terdiri dari empat mahasiswa. Teknik penilaian Penilaian portofolio dalam penelitian ini menggunakan rubrik holistik yang menilai berdasarkan kesan secara keseluruhan atau kombinasi dari semua kriteria. **Deskripsi dan Hasil Penelitian Siklus I:** Pada siklus I dilaksanakan dalam tiga kali pertemuan yang dilaksanakan di ruang BK A jurusan bimbingan konseling FIP Undiksha. **Pertemuan pertama** membahas kembali konsep awal praktikum asesmen psikologi teknik tes, menentukan jenis praktikum asesmen psikologi teknik tes yang digunakan (disepakati audio visual), menentukan keterampilan praktikum asesmen psikologi teknik tes

yang ditingkatkan, setelah itu dilanjutkan dengan pemberian informasi mengenai penilaian portofolio, mulai dari konsep serta langkah-langkah prosedur pelaksanaannya. Saat pertemuan pertama ini juga diberikan waktu sesi diskusi agar mahasiswa memiliki persepsi yang sama mengenai asesmen psikologi teknik tes dan *penilaian portofolio* dalam penelitian ini. **Pertemuan kedua pada siklus satu terdiri dari dua kegiatan, kegiatan pertama** yaitu melatih keterampilan merencanakan pemilihan media dimana dalam aspek ini ada beberapa hal yang dilihat yaitu menentukan tujuan dari pemilihan praktikum asesmen psikologi teknik tes yang akan dibuat, menentukan sasaran sesuai dengan karakteristik mahasiswa, menentukan karakteristik jenis media yang akan digunakan, menentukan waktu pelaksanaan, menganalisis biaya yang diperlukan, menganalisis ketersediaan bahan dalam pembuatan media, selanjutnya **kegiatan kedua** melihat Keterampilan membuat dan menggunakan naskah praktikum asesmen psikologi teknik tes yang disesuaikan dengan tujuan dan juga sasaran dari pelaksanaan layanan BK, selanjutnya **pertemuan ketiga** pada siklus satu terdiri dari dua kegiatan lanjutan yaitu **kegiatan pertama** melihat keterampilan membuat praktikum asesmen psikologi teknik tes sesuai dengan perencanaan dan naskah yang telah dibuat, lalu **kegiatan kedua** melihat keterampilan mempresentasikan praktikum asesmen psikologi teknik tes yang telah dibuat dilihat dari sistematika laporan makalah yang dibuat dan juga kemampuan menyajikan materi serta menanggapi pertanyaan saat presentasi. selama proses kegiatan tersebut masing-masing kelompok diobservasi, sesuai dengan indikator keterampilan yang dilihat. Ditunjukkan bahwa pada siklus I mencapai skor rata-rata kelas 33 atau 32,5% skor ini masih berada pada kategori sangat rendah. Hasil pengamatan pada siklus I baik itu pertemuan 1, 2, dan 3 menunjukkan beberapa hal pelaksanaan kegiatan yang perlu untuk diperbaiki oleh mahasiswa (1) dalam keterampilan merencanakan praktikum asesmen psikologi teknik tes mahasiswa yang tergabung dalam kelompok, belum dapat menentukan/merumuskan tujuan secara realistis mengapa praktikum asesmen psikologi teknik tes dibuat, sehingga untuk langkah selanjutnya mereka terhambat seperti menentukan karakteristik dan juga terhambat dalam menentukan waktu pelaksanaan, (2) mahasiswa belum mampu membuat naskah media dengan baik karena, naskah media yang mereka buat tidak didasarkan pada perencanaan, malah mereka membuat naskah dengan tujuan bahkan sasaran yang berbeda, mereka hanya melihat pada layanan yang didapat. 3) dalam membuat media mereka langsung mengambil video dari youtube tanpa disesuaikan dengan perencanaan dan naskah yang mereka buat, 4) kemampuan mempresentasikan media masih kurang

Berdasarkan temuan-temuan observasi tersebut, maka pada sesi refleksi kegiatan, beberapa rekomendasi yang perlu diperbaiki dalam kegiatan praktik berikutnya yaitu: (1) mengulang kembali konsep materi sehingga mahasiswa mampu memahami pentingnya pelaksanaan metode ini untuk meningkatkan keterampilan merancang praktikum asesmen psikologi teknik tes (2) meminta mahasiswa untuk lebih serius dan fokus dalam melaksanakan setiap langkah dari kegiatan yang dilakukan, agar kegiatan penelitian ini berhasil (3) meminta mahasiswa untuk merumuskan tujuan pembuatan media secara realistis sehingga untuk perumusan selanjutnya dapat lebih mudah dilakukan, 4) merubah strategi pelaksanaan kegiatan, dimana pada siklus 1 ini mereka hanya bekerja dikelompok tapi untuk dsiklus dua mereka memperlihatkan hasil perencanaan naskah pada kelompok lain untuk di berikan masukan. Hal positif yang dapat diambil hikmahnya pada siklus 1 ini adalah, mahasiswa terlihat mampu bekerjasama secara baik dalam kelompok dan saling bantu membantu apabila ada teman yang belum memahami materi, mereka selalu mencoba dan berusaha secara serius dan semaksimal mungkin untuk mencapai perubahan yang lebih baik lagi. **Deskripsi dan Hasil Penelitian Siklus II:** Melihat hasil siklus I yang masih belum mencapai target yang diinginkan maka kegiatan penelitian ini dilanjutkan pada siklus II, dimana siklus II ini dilaksanakan dalam tiga kali pertemuan, tempat dilaksanakannya pertemuan masih sama, yaitu diruang kuliah BK A jurusan bimbingan konseling. Pertemuan pertama diawali dengan mengingatkan mahasiswa agar lebih serius lagi dalam melaksanakan kegiatan, karena mereka belum mampu merancang praktikum asesmen psikologi teknik tes sesuai dengan prosedur, kemudian ditekankan pada mahasiswa untuk lebih berusaha lagi pada siklus kedua ini, setelah kegiatan penanaman motivasi pada mahasiswa, lalu kegiatan dilanjutkan pada kegiatan inti yaitu pemberian masukan atas temuan-temuan yang didapat pada siklus I. Berdasarkan hasil pemberian tindakan pada pertemuan pertama, maka

pada pertemuan kedua dan ketiga peneliti memberikan kegiatan yang sama yaitu dengan menggunakan langkah-langkah *penilaian portofolio* yang dikaitkan dengan aspek keterampilan praktikum asesmen psikologi teknik tes yaitu keterampilan dalam menyajikan tes, Keterampilan membuat dan menggunakan naskah praktikum asesmen psikologi teknik tes yang disesuaikan dengan tujuan dan juga sasaran dari pelaksanaan layanan BK, Keterampilan membuat dan menggunakan praktikum asesmen psikologi teknik tes sesuai dengan perencanaan dan juga naskah yang telah dibuat, dan, Keterampilan menggunakan praktikum asesmen psikologi teknik tes dengan cara mempresentasikan praktikum asesmen psikologi teknik tes yang telah dibuat. Inti perbaikan yang dilakukan pada kegiatan siklus dua ini adalah mahasiswa “menjual”/menawarkan hasil perencanaan dan naskah medianya kepada kelompok lain untuk diberikan masukan atau komentar.

Data menunjukkan bahwa pada siklus II terjadi peningkatan skor, dimana data siklus I rata-rata pencapaian skor mahasiswa sebesar 33 yang berada pada katagori rendah dan pada siklus II ini mengalami peningkatan menjadi 37 yang berada pada kategori sedang. peningkatan skor ini juga terlihat dimasing-masing kelompok, seperti yang terlihat dalam tabel diatas

Hasil pengamatan pada pertemuan 1,2, dan 3 pada siklus II ini menunjukkan beberapa hal pelaksanaan tahapan kegiatan penilaian portofolio yang perlu diperbaiki yaitu 1) masih ada mahasiswa yang menjadi anggota kelompok tertentu yang ketika diminta untuk mengikuti apa yang sudah dinstruksikan dosen, mereka tidak melaksanakannya dengan serius, 2) beberapa kelompok masih terlihat masih belum dapat merumuskan tujuan dengan layanan BK yang dipilih, namun untuk langkah selanjutnya sudah dapat dilakukan dengan baik, mereka juga sudah dapat membuat naskah sesuai dengan rumusan tujuan yang dibuat, 3) dalam mempresentasikan hasil media yang dibuat beberapa kelompok masih belum pas dalam menggabungkan antara vidio dan suara dalam film sehingga makna film atau vidio tersebut hilang. Berdasarkan temuan-temuan observasi tersebut, maka pada sesi refleksi kegiatan, beberapa rekomendasi yang perlu diperbaiki dalam kegiatan praktik berikutnya yaitu: (1) mahasiswa diberikan tugas untuk kembali mengamati kelompok lain yang sudah mampu untuk melaksanakan prosedur dengan benar, sehingga nantinya semua kelompok dapat melaksanakan dengan benar metode ini, 2) perwakilan anggota kelompok diminta untuk mencoba memberikan pendapatnya terhadap kelompok yang sudah melaksanakan langkah-langkah tersebut 3) tetap menanamkan hal-hal positif pada mereka sehingga mereka dapat menunjukkan karya yang lebih baik lagi. Pada siklus II ini ada suatu pembelajaran yang menarik yang peneliti dapatkan, hal ini terlihat saat kegiatan memberikan saran dan masukan pada kelompok, ada yang bahkan rela melakukan perbaikan atau membenahi vidio yang dianggap kurang menarik, sehingga mereka dapat memperbaiki bersama, artinya walaupun merka dalam posisi berlainan kelompok tetapi dalam diri mereka tidak ada keinginan untuk menyaingi kelompok yang lain, mereka mau bersama-sama belajar untuk hasil yang lebih baik. Pada siklus II ini ada suatu pembelajaran yang menarik yang peneliti dapatkan, hal ini terlihat saat mahasiswa secara spontan meminta pada dosen sehingga, sehingga hal ini mengindikasikan bahwa metode *penilaian portofolio* tepat digunakan untuk meningkatkan aktivitas dan hasil belajar mahasiswa.

Pembahasan Hasil Penelitian: Hasil penelitian ini menemukan bahwa implementasi *penilaian portofolio* berorientasi *lesson study* dapat meningkatkan keterampilan mahasiswa membuat praktikum asesmen psikologi teknik tes. Peningkatan tersebut dapat diamati dari peningkatan skor mahasiswa pada siklus I, dan II, selain itu berdasarkan pengamatan yang dilakukan pada mahasiswa dalam proses pembelajaran dikelas, mahasiswa sudah mampu menunjukkan keterampilan dalam merencanakan pemilihan media yang akan dibuat, keterampilan membuat dan menggunakan naskah praktikum asesmen psikologi teknik tes yang disesuaikan dengan tujuan dan juga sasaran dari pelaksanaan layanan BK, keterampilan membuat dan menggunakan praktikum asesmen psikologi teknik tes sesuai dengan perencanaan dan juga naskah yang telah dibuat, dan Keterampilan menggunakan praktikum asesmen psikologi teknik tes dengan cara mempresentasikan praktikum asesmen psikologi teknik tes yang telah dibuat.

Media bimbingan dan konseling dalam penggunaannya harus relevan dengan tujuan/ kompetensi yang ingin dicapai dan isi layanan bimbingan dan konseling itu sendiri. Hal ini mengandung makna

bahwa penggunaan media dalam bimbingan dan konseling harus selalu melihat kepada kompetensi atau tujuan dan bahan atau materi bimbingan dan konseling. Penggunaan media bimbingan dan konseling bukan merupakan fungsi tambahan, tetapi memiliki fungsi tersendiri sebagai sarana bantu untuk mewujudkan situasi bimbingan dan konseling yang lebih efektif. Penyelenggaraan kegiatan ini dilaksanakan dengan menggunakan prinsip performance assesmen dimana penilaian ini menanamkan kebiasaan bekerja dengan baik, seperti bertanggungjawab secara individu maupun kelompok, keterampilan bekerja sama, tekun, memperhatikan keakuratan dan kualitas, jujur, memperhatikan keamanan, dan rapi. Selain itu penilaian portofolio juga dikatan sebagai suatu sistem untuk menilai proses dan produk serta menilai kualitas penyelesaian tugastugas yang diberikan pada mahasiswa

Penelitian yang dilakukan masih memiliki keterbatasan yaitu: (1) Pelaksanaan penelitian masih sering melewati batas waktu yang telah direncanakan, hal ini disebabkan pada saat tahap pemeranan dan evaluasi memerlukan waktu yang cukup lama sehingga ketika waktu pelaksanaan sudah melampaui yang telah direncanakan, peneliti dan konselor harus mengkomunikasikan kepada peserta pelatihan dan meminta kesepakatan mereka untuk melanjutkan kegiatan (2) Pedoman Observasi dalam penelitian ini dikembangkan oleh peneliti sendiri dan belum dilakukan uji kelayakan seperti uji validitas terhadap isi pedoman observasi, dan (3) Keterbatasan selanjutnya penelitian ini hanya melihat pada hasil akhir kelompok saja sehingga hasil penelitian masih belum membuktikan keefektifan *penilaian portofolio* untuk meningkatkan keterampilan membuat praktikum asesmen psikologi teknik tes dalam jangka waktu panjang. Walaupun demikian, dengan adanya beberapa kelemahan/keterbatasan tersebut maka untuk menjaga validitas internal dilakukan beberapa upaya yaitu: mengurangi ancaman dari aspek testing dan instrumentasi dengan menggunakan tes yang sama untuk semua kelompok.

Berdasarkan pembahasan hasil penelitian tersebut di atas, sangat penting bagi dosen, untuk berdedikasi membantu meningkatkan praktikum asesmen psikologi teknik tes yang salah satunya dapat dilakukan dengan memberikan *penilaian portofolio*. Pelayanan bimbingan dan konseling dapat berjalan lebih baik dan menyenangkan karena disertai dengan pemanfaatan media bimbingan dan konseling yang baik, terarah dan sistematis. Hal ini nantinya akan berdampak pada manifestasi dan akumulasi kinerja mahasiswa sebagai calon konselor, yang pada gilirannya akan memberikan kesan bahwa konselor bekerja secara profesional, cakap, efektif, dan efisien, serta tidak gagap teknologi. Harapannya kegiatan ini mampu dilaksanakan secara continue di kampus mengingat saat ini, dosen dituntut bersikap kreatif dan inovatif dengan cara-cara yang tepat dan efektif dalam memberikan sebuah layanan untuk menghadapi masalah mahasiswa yang semakin kompleks.

4. SIMPULAN

Berdasarkan hasil analisis data, dapat ditarik kesimpulan bahwa *Model Pembelajaran Kooperatif* dengan berbantuan *Penilaian Portofolio* dapat meningkatkan aktivitas dan hasil belajar mahasiswa dalam praktikum asesmen psikologi teknik tes. Peningkatan hasil belajar yang dicapai mahasiswa sebagai pengaruh kegiatan siklus *plan, do, see* secara berkesinambungan dalam setiap pertemuan kegiatan praktik yang telah memberikan banyak *lesson learned* dalam pengelolaan dan penyelenggaraan kegiatan *Model Pembelajaran Kooperatif* dengan berbantuan *Penilaian Portofolio*. **Saran:** Saran yang dikemukakan melalui penelitian ini terdiri dari dua bagian, pertama saran secara teoritis dan kedua saran secara praktis. **Saran Secara Teoritis:** Hasil penelitian ini diharapkan dapat menambah referensi dalam layanan bimbingan konseling, selain itu juga dapat memberikan referensi untuk pemberian materi terkait dengan keterampilan praktikum asesmen psikologi teknik tes. Peneliti selanjutnya dapat mengembangkan buku panduan merancang praktikum asesmen psikologi teknik tes dan dapat dipublikasikan sehingga dosen ataupun konselor sekolah dapat menggunakannya ketika praktikum asesmen psikologi teknik tes. **Saran secara Praktis: Untuk dosen Model Pembelajaran Kooperatif** dengan berbantuan *Penilaian Portofolio* ini telah terbukti dapat meningkatkan keterampilan praktikum asesmen psikologi teknik tes, oleh sebab itu dosen dapat menggunakan teknik ini sebagai sarana untuk meningkatkan keterampilan lain dalam pelaksanaan layanan BK. **Untuk Peneliti Selanjutnya** Penelitian ini menggunakan desain PTBK, untuk peneliti selanjutnya dapat menindak lanjuti penelitian ini dengan menggunakan desain yang berbeda

seperti *equivalent time series*, penelitian one group

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SINGLE AND GROUP PRESENTATION TOWARDS STUDENTS' INVOLVEMENT

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Abstract: This study is to find out the students' involvement during the employment of single and group presentation in the content subject of teaching writing of English Department at University of Muhammadiyah Gresik. The class had already undergone a lesson study by focusing on the application of single and group presentation during four open classes. After collecting data through questionnaire and interview, it showed that the students' involvements were growing to reinforce their feeling of learning in sharing ideas (collaborative), high responsibility to participate when to do so (participant), and high confidence to learning abilities (being more independent). This study, then, suggests that interaction stimulation through presentation from single to group works is paramount to practice in teaching the content subjects at English Education.

Keywords: Single and Group presentation, Students' Involvement

1. INTRODUCTION

It is widely agreed by scholars that learning contains two main elements that complement each other, namely cognitive and affective. These two things should be major concerns by all learners and lecturers. Many studies have shown that affective factors are often important in learning because learners mostly have adequate affective abilities that may have possible impacts on improving cognitive abilities.

Learner affective competence can be nurtured in learning participation to determine better learning outcomes. High learning participation makes overall learning outcomes also improved. This was proven by research on the application of learning model that seeks to enable students to improve learning outcomes. Puspitasari's study (2009) showed that the activity of learning can improve learning outcomes. A research by Siskandar (2009) also proven to support the same results in which full involvement of students in group of learning with cooperative learning approach, can improve student learning outcomes.

Rogovin (2001) asserts that good class participations can develop class dynamics as well. In order to maximize the participation process, it needs four important efforts as follows: a) provide opportunities of small group discussions prior to the classical presentation, b) develop a model of small group discussions optimally, c) familiarize the learners to raise their hands when they interact and express opinions, d) appoint or call good learners who raise their hands or not during the learning process. Caicedo (2015) also confirmed that to increase participation and student involvement in learning, interesting activities are needed to empower students using presentations and discussions, to control discipline by making a list of presentations, and to conduct based process assessment.

Attention to the problem of affective factors in this learning, then, is a good entrance to improve the quality of learning. In many conditions, affective of learners will appear when the learning environment is designed to support an increase in the affective competencies, and are usually marked by the involvement of high learning by the learners themselves.

Good learning interaction can process the intellectual development of students in understanding and developing a cognitive ability of the pattern and its perspectives. Because the interaction itself certainly requires a process of learning and analysis of materials, linkage with previous knowledge to be able to resolve issues so as to maximize the learning content to improve the quality of learning (Abrami et al. 2011; Moore, 1989). learning interactions greatly affect the success of learning and achievement of

students because the better growth of interaction in learning content of the material being studied will provide more opportunities for students to master the materials more quickly and obtain better grades (Zimmerman 2012).

Involvement of learners determines the success of the learning process that teachers do in the classroom. We can be sure that if the involvement of learners in the classroom is done optimally, then the output obtained by the learner are also certainly optimal, and thus the chances of improving the quality of teaching are also high. There are several characteristics of learner engagement that we can recognize primarily on the characteristics of low or high involvement (Bergquist & Phillips, 1975).

Among the characteristics of low learner involvement are as follows: 1). Avoidance, namely an attitude which is always to refuse new activities offered in the classroom. 2). Negative Competition, which interprets learning as an effort to find winners and losers only. 3). Dependence, the attitude of students who are less independent and far from being responsible for the activities in the classroom. While the characteristics of high learner involvement are as follows: 1). Collaborative, which is fully involved in every activity in the classroom either already planned or not planned. 2). Goog participants, which always felt excited and liked to all activities in the classroom, to exchange opinions with other groups, and to help others move forward together. 3). Independence, which has the character of a high independence when working on all the activities in the classroom.

Thus, very serious attention to the increasing involvement of high learner can help improve the attention quality to better learning, and it is necessary to increase better output of learning anyway.

Especially for learning the course content that is subject which emphasizes the understanding of the content, the effectiveness of content delivery is often the most decisive thing on learning success. Effective delivery of content is to create learning opportunities in order to optimize its affective abilities so that his cognitive abilities can automatically be obtained in the learning. Thus the good interaction and engagement of learners in the classroom are crucial to the fullest opportunities for the acquisition of the ability of learners of both affective and cognitive, especially in the subject of content course.

For the main objective to master content, the learning requires a centralized model of learners. The model of Learning centered is required for adult learners which already have a good awareness in preparing, undertaking and evaluating themselves in all learning process. So that the activities maximally optimize their role in learning. The process of developing this awareness can be done by the strategy of discussion and presentation for individuals and groups. Discussions and presentations are a very common method practiced by the majority of teachers, because at the higher education level, this may exchange ideas that take place naturally, which in turn can raise awareness about the importance of following learning process for both individual and group. For adult learners, especially students in college, learning centered model that focuses on the discussion and presentation is important for several reasons as follows: 1), Adult Learners have adequate learning orientation, especially in terms of interest and the results that will be obtained during the learning which takes place. 2). They have a learning experience that is enough to determine the learning strategies so that optimal self awareness is needed to help this process. 3). They are learners who have a good abstract thinking ability which is necessary to support learning activities that can sharpen their thinking ability optimally. 4). They have previous experience in conquering learning difficulties, so that they can adapt the strategies of not being resistance with new difficulties. 5). They have a tendency to optimize the self-realization in the study.

The four characteristic of adult learners are usually owned by college students so that when they are at school, these characters have to be accommodated in learning strategies including the the use of discussion and presentation in the classroom either through individual or group.

Collins & O'Brien (2003) add that the learning model of student center learning is a learning approach where students become actors in determining the content, activities, materials, and steps in learning. So that teachers should always provide learning opportunities for students to be independent. Among the examples of learning activities are simulation, problem solving, role play, cooperative and collaborative activities, and so on. Furthermore, Vygotsky (1978) also adds that learning occurs through a process of continuous change in the individual's cognitive structure directly related to the socio-cultural

environment of society so that opportunities for more active and more explorative personally and maximally. A good learning experience can be formed by providing an opportunity for students to exchange ideas between groups of learners so as to produce meaningful learning experiences that can help link the learning of information as the prior knowledge and can facilitate problem solving (Anderson and Garrison, 1998; Mayer, 2002; Conole 2013).

Marinko (1988) also confirms that problem solving is the practice or attempt to solve problems through a process of correct investigations. This activity helps students to be able to sort out the problems and resolve them in accordance with the capacity of students themselves so they are accustomed to solving problems both in the classroom and outside the classroom. Fletcher (2003), mentions that a good student engagement is the process of involvement of students in any educational process that aims to strengthen their commitment to education. Meaningful involvement of course also requires knowledge, experience, and perspective to each adequate individual. The involvement of students contains some important things, namely: 1). To emphasize the leverage engagement. 2). To interrelate with the activities and strategy as planned. 3). To depend on ongoing support structure. 4). To require consistency of support and desire to integrate students with all aspects. 5). To embed students to always have a purpose in learning. 6). To capitalize students. 7). To create a learning program that leads to applied learning to optimize existing resources.

Oakley et al., (2004) believes that more students get involved in discussion, it will create a better quality of interaction. If this is true, it will strengthen cooperation to produce positive learning and develop a sense of self-confidence of students. If there is a strong interaction it will generate more confidence in learning. Thus generating a more open learning environment where each student can speak freely and without a load so that it increases the motivation to learn, especially internal motivation. These activities also generate cooperation among individuals so that interaction and effectiveness of learning increase (Johnson and Johnson, 1985).

As part of the learning process using learner center approach that emphasizes on problem solving, this study attempts to portray and investigate the use of single and group presentations as efforts to increase student involvement in learning the course content of teaching writing at English education Department of University of Muhammadiyah Gresik.

2. RESEARCH METHOD

This study is aimed to see and investigate the application of single and group discussion on the course content (i.e. the teaching of writing) being offered in fourth semester, majoring in English education at University of Muhammadiyah Gresik. Subjects of the teaching writing use lesson study involving four lecturers as a team teaching. The learning process is carried out in three main stages, namely Plan, Do, and See. At the Planning phase, it is to discuss the materials and methods used, the stage of Do is to implement the steps of learning in the classroom by appointing a model lecturer interchangeably, and stage of See is a reflection of learning in which the results of these implementations are discussed together to do corrections and improvements for the the next stage. After four meetings are completely done, the researchers distributed questionnaires to the 25 students who participated in the class as a whole, and also conducted interviews to students (4 students) to explore the data that had been obtained through the questionnaire. The next step is to draw the research conclusion from the two main data collections and analysis.

3. RESULTS

This section presents two major points that is the research results and analysis of the questionnaire and of interview. All pictures of research results can be explained in the next section sequentially.

3.1 Results of Questionnaire

The prepared questionnaire items use three categories of the main characteristics of learner engagement as it has been developed by Bergquist and Phillips (1975), who divide the involvement of learners in the classroom into three characteristics that is collaborative, partisipant, and independent. Each of these categories is clarified by developing statement into seven items. Each participant is asked to provide a response to each item of statements that have been developed from these three categories into five levels of scale that is the number 1 for *strongly disagree*, number 2 for *disagree*, number 3 for *less agree*, number 4 for *agree*, and number 5 for *strongly agree*. Explanation and category of the item in question and the results can be explained in Table 1 until 3 below.

Table. 1. Results of Questionnaire about Students' Collaborative Involvement

No	Items	Scale (n:25)				
		1	2	3	4	5
	<i>Collaborative</i>					
1.	Able to share ideas during studying at classroom				19	6
2.	Able to develop ideas at classroom					25
3.	Able to work together with instructor/lecture				20	5
4.	Able to work together with friends					25
5.	Able to optimize role of learning in groups				18	7
6.	View the classroom as the best interaction among others				20	5
7.	View the classroom as the best place to learn the essence of teaching materials				20	5
	Total				19 (76%)	12 (48%)

Table 1 is a summary of learners' answers in the classroom engagement with the category of collaborative engagement. All 25 (twenty five) learners feel that they are able to develop the involvement of learning collaboratively during the learning process as indicated by 19 (nineteen) or 76% agree and 12 (twelve) or 48% stated strongly agree. In more detail, the ability to develop the collaboration is shown by some supporting items of statement including the ability to share ideas (19 people agree and 6 strongly agree), the ability to develop ideas (25 people strongly agree), the ability to work together with teachers (20 people agree and 5 strongly agree), the ability to work with friends (25 people strongly agree), able to optimize the role of the working group (18 people agree and 7 strongly agree), look at the class as the best place in the interaction (20 people agree and 5 people strongly agree), and look at the class as the best place to learn the content materials (19 people agree and strongly agree 6).

Tabel 2. Results of Questionnaire about Students' Involvement as Participant

No	Items	Scale (n:25)				
		1	2	3	4	5
	<i>Participant</i>					
1.	Eager to understand the unknown concepts deeply and in details				19	6
2.	Like the classroom				20	5
3.	Want to be responsible in class					25
4.	Want to be responsible outside of class					25
5.	Always participate to finish works together					25
6.	Feel contribute maximally to finish all class works				25	
7.	Always able to finish group works as planned				25	
	Total				22 (88%)	17(68%)

Table 2 above shows the involvement of the learner as participant during the process of learning in the classroom. Overall, the learners have put their role optimally as participant in the classroom as indicated by 22 people or 88% of them agree and 17 people or 68% strongly agree. The description of optimal role of the learner as a participant during the learning process is shown by the description of each item that is a strong desire to explore the unknown ideas (19 people agree and 6 strongly agree), like the class (20 people agree and 5 strongly agree), responsible during the learning process inside (25 people strongly agree), responsible for the process of learning outside the classroom (25 people strongly agree), participate actively of accomplishing tasks together (25 people strongly agree), contribute maximally to finish tasks (25 people agree), and complete the task in accordance with the planning of the lesson plan (25 people agree).

Tabel 3. Results of Questionnaire about Students' Independence in Involvement

No	Items	Scale (n:25)				
		1	2	3	4	5
	<i>Independent</i>					
1.	Always ready to accept woks during studying at class.					25
2.	Always able to finish tasks individually.					25
3.	Able to optimize thinking ability in the discussion.				25	
4.	Able to optimize finishing group works properly					25
5.	Able to accept other suggestions to finish group tasks				18	7
6.	Consider the content materials higly important and advantageous.				19	6
7.	Feel confidence to enhance learning competency					25
	Total				21 (81%)	18 (72%)

Table 3 above is a summary of the questionnaire related to the description of learning engagement in learning independence. The results show that 21 people or 81% agree and other 18, or 72% strongly agree. Detailed information about the independence of the involvement of this learning is shown that always ready with all the assigned tasks (25 people strongly agree), capable of completing tasks well (25 people strongly agree), optimize thinking during the learning process (25 people agree), optimize the thinking to the task group (25 people strongly agree), always work on individual tasks and still receive inputs from others (18 people agree and 7 strongly agree), consider content material as important and helpful (19 people agree and 6 strongly agree), and confident to improve learning ability (25 people strongly agree).

The three table above have shown that the three categories of engagement related to collaboration, participant, and independence have taken place during the learning process. Thus the presentation of individual and group have convincingly improved learner engagement during the learning process in the course of teaching writing as the course content.

3.2 Results of Interview

To strengthen the data collected through questionnaires, this study also presents data on the results of interviews with learners. The interview was conducted by using an snowbowling method where only a few students (four students) were selected and interviewed for analysis to obtain information that is consistent and has met the saturation level of the data obtained. Description of the results of interviews with each student can be seen in the following section.

The first point in the interview is about opportunities for collaboration between groups and individuals during learning process.

Student 1

.... actually in the discussion ya... based on myself, I can get new knowledge from my class, I can know about somethings that are new of my fresh opinions, so ya .. I think can change and get new knowledge from the others....I can develop my opinions and easily work with my friends When I discuss with my friend in groups especially small group, I can optimize more opinions.

Student 2

..... Okay, when the process begins in the classroom, I can develop my sentences our thinking with my friends....and how we develop..... there is one step when I develop it..... the first is to share ideas each other and we try to have conclusion, and after that we try to ...e...eh... present the results.

Excerpts from student 1 and 2 above show their assertions about the opportunities for them to develop ideas individually or in groups. The development of this idea could happen when they work individually and in the context of group work. In general, the development of ideas and the sharing of ideas in the group becomes more meaningful to reinforce the idea that has been understood individually. Group presentations in the form of this discussion has prompted not only the ability to master the material but also their verbal skills.

Furthermore, the process mastery and its stage can be described in a quotes of students 3 and 4 below.

Student 3

.... it is easier for me to think about ideas, ... we have a lot of people in a group for their own opinions and ideas..... because of that, it is easier to get inspiration from them. But the downside of the the group experience is that sometimes only a few people who want to express the ideas. Well some of them just to be silent and be quiet. I think the class is the place to interact ideas among friends so I have got the substance of the materials especially the ones who want to discuss in group with all friends.

Student 4

..... I think the collaboration I made in the class is very nice compare with ordinary situation,.... but few problems happen when some of the participants do not pay attention to others. In general we already focus to ourselves I mean our ideas to present in the big group.usually we do it in a group..... but actually we have to do preparation individually before. We know that the process is divided into two stages, the first one is in small group and the second one is in the big group, so we have advantages to train ourselves to practice ideas twice at different level.

Two citations of students 3 and 4 above contain three important points: first, the developed ideas from the results of focus group discussions have inspired the ideas of group members individually. This is caused by the complementary interaction between the group itself and its members. The second point is, to follow the process of discussions and group presentations, initially and mostly students are less active participation, but in the end, most of them are good finally to be able to participate in the learning process. Third, the process of discussions and presentations provide two advantages that is advantages to improve training and practice in the delivery of ideas, and the second is an increase on content materials.

The second point in the interview is regard to the participation of the members as mature participant in the learning process. Interview data about participants' involvement is described in the following sections:

Student 1

I addition, I can study personally from my friends, therefore I like the discussions in the class. and I feel and I think I can be more responsible inside and outside of the class.from discussion I learn about how toto respect other opinions. So far, I can do ... maximally the activities in the groups.of course I have to prepare before coming to the class, When if I prepare the materials before....and then I go the class, and learn the materials before, perhaps if I prepare the materials before the class, I can be more confidence. During the discussion, I always compare the opinions, and then I I get results of better opinions from others to have better conclusion.Based on the topics to discuss, usually we have

different opinions and knowledge, so I think every student has different opinions to suggest, even if I get suggestions from others I always accept that.

The quote of student 1 above indicates the level of his involvement as a participant in the classroom. This is evidenced by his statement of affection following the lecture with a model or strategy of discussions and presentations. The increased sense of responsibility is at the time before the lectures, during the lectures, and after the lecture. All the process have been undertaken so that at the end of the class he was able to convey ideas and suggestions as well which indicated his mastery of the material.

The involvement of learners as well as the participants can also be seen in the interview excerpts of students 2, 3, and 4 below.:

Student 2

I like the class.... because the activities in the classroom are very fine and then the students can interact each other so that every one including me can be responsible to handle and finish all tasks.

Some of the time I cannot finish the activities at the beginning because I feel not confident but at the end of my class I feel more confident finally. This is because I have more opportunities to discuss and share ideas with friend based on a lot of sources.

Student 3

Yes it is actually quiet fun when all participants want toparticipate, well... from my last experience I became the head or the speaker of group to finish the work. For example each group has a particular topic and members of the group have to discuss as their responsibility because there are various works to cover.

Student 4

.... Actually before coming to the class, I have prepared the materials, but then I know I have still few problems on vocabulary difficulties because the journals I read are complicated usually. After doing the activities in group I got better understanding of the materials .

The three quotes above have strengthened the statement of the quotation in the student 1 before, of their degree of involvement in the lectures mainly on preferences in university classes, a growing sense of responsibility, and also increasing mastery of the material. The additional and important quote above is the optimization of the role of the individual as a participant due to fewer opportunities to practice discussions and presentations, and also the diversity of the many learning resources for the group to hold discussions.

The third point in this interview is regarding the attitude of the independence of participants during the learning in class. The results of the interview can be explained in the following sections.

Student 1

So finally I feel more confidence during and after the discussion . The materials to be discussed are also importance and had made advantages for me, especially this is a learning situation to practice as in public because we have to deliver ideas in front of friends so that makes me more confidence. Even.....the materials of the teaching writing are important for me as in teaching speaking materials.

Student 2

Finally not only the process is interesting but also the materials themselves that make us some advantages of understanding all materials..... because there are a lot of time to discuss.

Excerpts of students 1 and 2 above illustrate the delivery of training opportunities in the repeated opinion in discussion groups have given good impacts to their confidence when delivering ideas. Their increasing confidence also have a positive impact on the ease of understanding the materials themselves.

Furthermore, the two above statements have also been supported by other two students 3 and 4 below:

Student 3

So, the group should make simple materials from the task varieties.The materials have beneficials especially of the teaching writing approaches. At the end of the class I could be more independent than before because I learn a lot from the hardship to finish the works.

Student 4

..... Because I experienced discussions many times in group finally I got more confident to finish all works especially on my personal attitudes to present in front of friends.

Two of these statements clearly describe the increase of confidence which is rising because of more frequency to convey the materials, especially on the completion of diverse tasks well done individually or in groups. The ability to complete tasks frequently has an impact on the increase of their confidence.

The results of this interview as a whole has shown an increase of student involvement in learning to follow the strategy of discussion and presentation mainly on three crucial points that is collaborations among fellow participants, the role as a participant optimally, and the increasing of learners' independence.

4. DISCUSSION

This research results the finding that the application of single and group discussion has provided opportunities for increased involvement of students that is very well demonstrated by the high percentage of responses to questionnaires (over 80%) agreed and strongly agreed with the statement concerning their involvement in three things, namely maximum collaboration, be a good participant, and become more Independent in doing any activities in the classroom. Data of questionnaires have also been strengthened by the positive responses from the interviews of four students who consistently find that the learning activities through single and group discussions can increase better involvement of learning.

This study provides an opportunity to see the role of university that it had a paradigm change of instructor role from transferring knowledge to students into the learning paradigm in which it produces learning through discovery to generate knowledge (Barr and Tagg, 1995). In general the perception of learning is a social process, which is collaborative, with each learner to communicate with others to develop knowledge. Generally, discussion and sharing opinions can improve motivation and produce better learning achievement and direct them to be active learners (Beaudoin 2002; Swan 2002). Tyler (1975) also finds that when students engage optimally in learning it will bring a sense of fun and enjoy in learning so that there is no boredom. Because it is always eagerly to continue to learn, it will help speed up the process of cognitive mastery of students to obtain learning goals. Therefore, Canary and Cody (2000) offer six types of requirements relating to the process of gaining knowledge that is the ability to adapt, conversational involvement, conversational management, empathy, effectiveness, and appropriateness. All of these characteristics have been realized in learning pattern in the form of single and group presentation that optimize participation and student involvement in learning.

This study is also consistent with the opinion of Billet (2002) who argues that learning is the result of participation in social interaction, thus allowing subjects to adopt a broader view. That means the need for expansion of the understanding of learning is a process of inter-psychological (ie between individual and social sources of knowledge). Learning is the involvement of social world, not just closed personal interactions. The learning model has to be developed to encourage activity and student involvement in learning (Harmer, 2007a, 2007b; Hinkel, 2006; Richards, 2006).

Student involvement is always related to efforts in which participants interact with course materials and learning activities to obtain optimal learning results. The term is often associated with the involvement of students in their own learning process, including the time and effort that is fully optimized for learning (Axelson and Flick 2010; Kuh, 2009). Riddell (2003) explains that learning activities should be adapted to character and purpose of learning especially conformity with class, age, time available and the characteristics of the class itself. It is important to bridge the relevance of what to target of student learning.

Grigoriadou and Glezou (2010) state that student engagement can be grown by optimizing the role of information technology in the classroom, especially the use of multimedia.

Learner involvement has five main characteristics (Astin, 1999), namely: 1). The physical and psychological involvement of the various activities. 2). Involvement occurs as a continuum where

different students demonstrate different levels of involvement on the type of activity. Whereas, the same student gave the different degrees of involvement at different times. 3). The level of student involvement can be both qualitatively and quantitatively. 4). The number of students involved in the learning associated with the development of the individual are in accordance proportionately to the number of students involved in the program. 5). The effectiveness of educational policies are good exercises to improve student engagement..

The results of this study also provide confirmation of the importance of assessment that promote learning as a process as Huba and Freed (2000) has mentioned that assessment in the learning process of learner center approach emphasizes the transition of focus from teaching to learning.

Of explanations and the above discussions, it can take the conclusion that the single and group presentation is part of the learning process that provides an opportunity to increase the participation of students, so that engagement in learning is also increasing. Increased participation and involvement can be optimized by taking into account the optimization of the students in collaboration, active participant and independent learning.

5. CONCLUSION

This study comes to a conclusion that the single and group discussion have increased student involvement in learning on course content of teaching writing in English Education at University of Muhammadiyah Gresik. The increased student involvement is evidenced by; First, the increased level of collaboration among students during the learning process, especially on the seriousness of delivering ideas and also actively exchanging ideas and learning materials optimally so that the contents can be achieved well. Second, each student has actively participated in learning, especially in the individual's participation of expressing ideas, help other group members in completing common tasks, and like all the assigned tasks. Third, each student is also independently able to complete each task and in the end they are able to improve their understanding of the learning material better.

The next important point is that independent learning can be triggered by the dynamic attitudes to collaborate, be good participant, and be independence in the study.

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SHARING TASK AND JUMPING TASK LESSON DESIGN IN LAW OF DEFINITE PROPORTIONS CONCEPT

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Abstract : The various student's competencies in learning is a challenge for teacher to create effective learning for each student. Therefore, a teacher must have a didactic skill to treat student's responses with various competencies. One of the ways to treat this matter is to make sharing task and jumping task learning design where students learn text book level learning material (sharing task) and jumping material beyond text book level (jumping task). This research is aimed to create sharing task and jumping task learning designs that solve the challenge in learning law of definite proportions. The subjects are 62 senior high school students of SMA Laboratorium UPI grade X IPA 1 and X IPA 2. This research employs descriptive qualitative method. The instruments of the research are TKR (Tes Kemampuan Responden), observation sheets, and interview guidelines. There are two implementations in this research. The findings in the implementations are the interaction between students and students with teacher in sharing task is more optimal than of jumping task, students are challenged and can answer jumping task problems; and learning difficulties still occur in the first implementation. Revised learning design in the second implementation can make the students' interaction more optimal. The interaction does not only happen in their own group but also interaction between groups. Furthermore, learning difficulties can be minimalized.

Keywords: Conceptual Change Text, Zone of Proximal Development, Actual Development, Potential Development, Fundamental Laws of Chemistry.

1. INTRODUCTION

The quality of teaching is a major challenge for Indonesia to improve the quality of education. One indicator of the quality of education can be seen from the results of TIMSS and PISA. Indonesia's participation in the International study Trends in International Mathematics and Science Study (TIMSS) and the Programme for International Student Asses. The quality of teaching is a problem for Indonesia to improve the quality of education. One indicator of the quality of education can be seen from the results of TIMSS and PISA. Indonesia's participation in the study: International Trends in International Mathematics and Science Study (TIMSS) and the Programme for International Student Assessment (PISA) since 1999 shows that the achievement of Indonesian children are not optimal in some reports on TIMSS and PISA.

One of the efforts made by the government to improve the challenge is to change the curriculum of Curriculum 2013. Completion of the SBC be made in the curriculum in 2013 include the changes in the paradigm of the learning patterns which initially centered on the teacher into a pattern of student-centered learning, learning patterns one direction (the interaction of the teacher-student) into an interactive learning (interactive teacher-learners-community-natural environment, source / other media), learning patterns isolated into learning for learners to gain knowledge from anyone and from anywhere that you can be contacted and obtained via the internet, learning patterns passive to active learning-looking approach is reinforced by learning model of science, learning patterns themselves into study groups.

Another step to improve the quality of education changing the curriculum is to improve the quality of students, teachers, materials, classroom learning process and environmental conditions. Among

some of the variables that influence the achievement of learning outcomes learners are teachers. Teachers are the ones who interact with students while in school. Teacher in charge to plan the learning process, implementing the learning process, assess learning outcomes, conduct guidance and training. Therefore, teachers must have professional competence, didactic, personal and social.

In addition, it needs to be done is to create an effective learning process. Effective learning process is characterized by two-way communication between teachers and learners who are not only the learned but how it should be studied. Arifin et al (2000) suggest that the learning process is a process of active communication interaction between students and teachers in educational activities. In learning activities there are students learning activities conducted and no teaching activities that teachers do. Both of these activities are related, resulting in active communication between students and teachers. Based on these descriptions, a teacher must have a didactic capabilities: the ability of a teacher to think of creating a situation in the learning process. The thought process of teachers in the context of learning occurs in three phases: before the learning, during the learning takes place, and after learning (Brousseau, 2002).

Based on early studies in one high school in Bandung, the learning process is not the expectations of the curriculum of 2013. The learning process is centered on teachers, students only receive information from teachers. Apart from that most of the high school students have difficulty in understanding the concepts of chemistry. It became one of the factors that makes the results less than the maximum evaluation of student learning, test scores of students on the topic of comparative law remains in one high school in the city there are 23 students who scored less than KKM and the average score was 63.2. This is consistent with research Krisnawati et al (2013), entitled Digging Concept Training Students Madrasah Aliyah About Stoichiometry by Using Two-Tier Diagnostic Instruments test, with the results of the average student's understanding on the concept of stoichiometry 37.56% which is low and to the topic Proust law is also only 19.80%.

Therefore, teachers should make learning design that minimizes the students' learning difficulties. The diversity of student response requires teachers to prepare the solution. the solution is action didactic and pedagogical actions that are equipped with the prediction of the response of students and teachers solutions. According to Suryadi (2010), learning design is equipped with a predicted response of students and teachers is the design didactic solutions.

- How is the characteristics of learning obstacle which could be identified related to the topic of law of definite proportions?
- How is the design of collaborative learning sharing task and jumping tasks in the topic of law of definite proportions?

2. METHODOLOGY

This research employs descriptive qualitative method Erickson in Sugiyono (2013) stating that the characteristics of qualitative research are as below: Intensive, long-term participation in a field setting, Careful recording of what happens in the setting by writing field notes and interview notes by collecting other kinds of documentary evidence, Analytic reflection on the documentary records Obtained in the field, Reporting the result by means of detailed descriptions, direct quotes from interviews, and interpretative commentar.

Participants in this study are the first respondent is the students who have studied law of definite proportions topic. They are students of class XI of the 2015/2016 academic year. And the second respondent is the students who will be taught the topic of law of definite proportions with collaborative learning sharing task and jumping task at grade X the of the academic year 2015/2016. The research subject taken only two classes because the design of the learning is done two cycles of learning to know the response characteristics of students through lesson analysis were used to analyze the learning. Chemistry teacher who becomes the model teacher is a teacher who will be teaching in the classroom that have been defined as a class of research subjects, and teachers who collaborated with researchers as team teaching.

The instrument of this research are the instrument test and non-test instrument. The test instrument in this research is referred to as Tes Kemampuan Responden (TKR). TKR is performed three times. TKR was given to students in grade XI IPA who has been studying the topic of law of definite proportions. This test is to identify learning obstacle to learning experienced by students when studying the law of definite proportions. Second TKR given to students of class X IPA-1 after the first implementation learning design based analysis of the students's learning obstacles. Third TKR is given to students of class X IPA-2 after the implementation of the lesson plan based on a revised draft first lesson. And non-test instrument are, the observation sheet, interview guides, lesson analysis sheets, and documentation.

No.	Amount of students (n = 24)				
	Scor 0	Scor 5	Scor 10	Scor 15	Scor 20
1	4,20%	66,70%	0	12,50%	16,70%
2	16,70%	37,50%	0	4,10%	41,70%
3	12,50%	66,70%	0	16,60%	4,20%
4	54,20%	12,50%	29,20%	0	4,20%
5	70,80%	29,20%	0	0	0

3. RESULTS AND DISCUSSIONS

Students' learning difficulties in the law of definite proportion can we get from identify result of (TKR) and results of interviews conducted to students who have learned law of definite proportion. And also supported by the results of interviews with the chemistry teacher. . TKR be a matter of description, amounting to 5 (five) questions prepared by grating questions in Table 1

Table 1 TKR's Indicators Questions of Law of Definite Proportions

No	Indicators Questions
1	Determining the elemental composition of the compound
2	Determine the mass ratio of the elements of a compound.
3	Make conclusions based on experimental data that has been known about the law of definite proportion and provide response based on discovered experimental data
4	Proving the law of definite proportions in a compound.
5	Determine the mass of the element to form a compound, a compound formed masses and masses of residual reactant

TKR results obtained from 24 students of class XI IPA who has been studying the material law of definite proportions. The following is a discussion of the difficulties experienced by students based on the identification of TKR answers.

Problem number 1: This problem relates to the ability of students to determine the elemental composition of the compound. Problem number 1 consists of two questions. The expected answer that students can determine how to determine the composition of elements present in the compound and can see the magnitude of the mass percent of iron and oxygen in the iron perkaratan. In this matter there are still many students who are wrong in doing. Distribution of student score data acquisition can be seen in table 2 Table illustrates the distribution of students' ability to solve problems to determine the elemental composition of the compound. Percentage obtained is used to determine how much student learning obstacles in resolving the matter. Based on the responses of the students obtained the following data:

From table 2 we can find the percentage to question number 1 is 66.7% with the acquisition of a score of 5, which means that more than half of the students have not been able to resolve the matter appropriately. Most of these students could only answer the way in order to determine the elemental composition but could not complete the calculation of the mathematical and there are some students who

can not distinguish between elements and compounds so that in the search for elemental composition into confusion. This are the obstacles students to solve the number one appropriately.

The largest percentage in question 2 is a score of 20 with a percentage of 41.7, followed by students who received a score of 5, 0 and 15. The data shows most of the students are able to calculate the comparison properly. Errors students in general are not able to look for the right divider so that it becomes the simplest comparison, so they are a hindrance in achieving the goals of students in the topic of law of definite proportions.

According to the table 2 it is clear that most students still can not do about the third well, the largest percentage are students who score 5. This is because the students still can not seek denominator in order to obtain a comparison of the simplest and yet understand the law of definite proportions sehingg experiencing barriers when ordered to make conclusions based on the calculation of the comparison questions.

The fourth matter is used to determine extent of students' abilities to solve problems as well as the application to determine whether or not the student is still confusion in calculating perbandingan. Pada Table 2 shows that the majority of students still can not analyze well proven with the greatest percentage of students who are a score of 0 is as much as 54.2%. Although it was followed by students who received a score of 10. It is stated that is the students are still not able to analyze problems and identify reasons why, indirectly visible students simply memorize the law of definite proportions.

Last TKR matter is still associated with the application of jukum comparison anyway, knowing his purpose analysis capabilities in solving the existing problems are more applicable. On the last question is intended to determine students' analytical power in determining the elemental mass to form a compound, a compound formed masses and masses of residual reactant. Based on table 2 looks most students who can not work on this matter with the largest score is the percentage of students who received a score of 0.

Interviews were conducted to students grade XI after melaksanakan test the ability of respondents (TKR) with the aim of confirming the answers TKR students. Interviews showed that students do not understand the law of definite proportions, most of them just memorized the only law of definite proportions so as to solve problems they encountered resistance. Here are the results of interviews with students.

- Researcher : Gimana bisa ga tadi? Ini yang ditanya nya apa sih?
Student : *Calculating the ratio of hydrogen and oxygen.*
Researcher : How to calculate it?
Student : *Emmm?forgot it mom. Eh,, fold or divide maybe*
Researcher : Oh okay, you already finish answer for problem of law of definite proportion, what is law of definite proportion who you know.
Student : *Emm it is...? It's element fix. Ahh,, I'm confuse.*
Researcher : Can you imagine step to solve this problem?
Student : *No... I can't. I realy confuse to solve this problem. It only know mass of O₂ but the problem we must find mass of CO₂*

Learning obstacle on the topic of law of definite proportion remains obtained from the identification TKR, interview students and teacher interviews that have been done in class XI. The identification results will serve as the basis to create a lesson plan so that the obstacles that arise can be minimized. Learning obstacle identified is that students can not determine the elemental composition of a compound, there are still students who can not distinguish elements and compounds, students still can not make the simplest comparison of a calculation, and the student memorized the law of definite proportions without understanding it. The design consists of a Chapter learning design and Lesson Design. Chapter design and manufacture of Design Lesson followed by repersonalisasi and re-contextualization is made by reviewing the university chemistry books and school chemistry book. The existence of a fundamental difference in meaning and presents a concept, the researchers and teachers more in-depth exploration of

the concept is in accordance with the limits of high school students so until researchers and teachers can construct a new design. Here's Lesson Design, which will be used in the implementation.

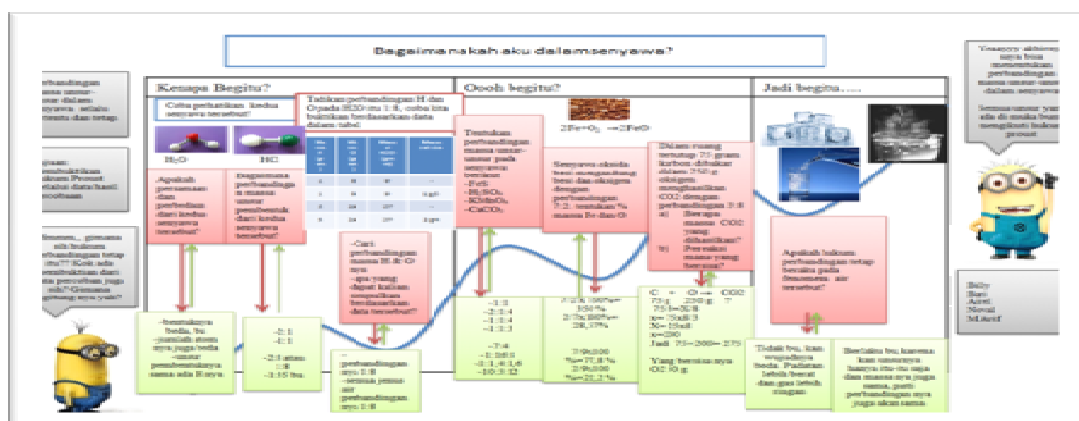


Figure 1 Lesson Design Law of Definite Proportions.

Lesson design consists of three phases, the first initial activity, the core activities and the closing, in which there are task-sharing activities and jumping task. At the beginning of the activities of teachers show props depicting molecular form of the compound H_2O and HCl , then students are asked to pay attention to both forms of the molecule and ask what similarities and differences of the two compounds. Prediction student response is that students can mention some similarities and its differences, namely 1) of its constituent elements but there are two and both its existing H, 2) different shape but, 3) Number of different atoms, 5) Student did not answer. Anticipation of his teachers lead students so that students see the similarities and differences that exist. Then the teacher asked how the mass ratio of the constituent elements of the two compounds. Prediction student answers as follows 1) H_2O 2: 1, its HCl 1: 2) H_2O 2: 8, 1:35 his HCl 3) H_2O 1: 8, 1:35 his HCl . The anticipation teacher gives instructions compared but its not the number of atomic mass of each of these elements. After confirming that the teacher answers students and teachers returned to ask based on the comparison of H and O previously obtained are 1: 8 what if the ratio of H and O obtained from experimental data, is still the same 1: 8 or not? And the teacher asked conclusions can be drawn based on the experimental data. Predict student answers are 1) the student answered ratio obtained remains the same even though its mass is different only when there is no residual mass of one element of excess, his conclusions all kinds of water has a mass ratio of the same element. 2) student confusion in answering because no residual mass. Anticipation that teachers do is to guide students to use leading questions on the answer should be.

Core activity is the main activity in learning which aims to develop the concept of the student and the student experience. At this stage the students were given the task in the form of Student Worksheet (LKS) is done through group discussion. At the core of this activity students make sharing with friends of his in doing LKS consists of 5 questions.

For about the first aims to determine students' ability to seek mass ratio of each element in a compound. In question number one student is given the task to calculate the comparison element on each compound with the goal of students experiencing the situation directly to obtain information about the law of definite proportions. After students answer questions about the number one followed by number two and number three on the form about an applicative so that students can better understand the sound by applying the law of definite proportions in terms of a more diversified.

The activities cover the activities of "jumping". Activities that occur at this stage students are given a problem that exceeds the level of distress in the form of a text book about contextual applications. Problems that give the students predict whether the law of definite proportions apply to the phenomenon of water. Based lesson design that has been designed together with the teacher, it can be concluded that there are four tasks that gave the student that is, students observe a demonstration of

differences in molecular shape and incorporate find a comparison of elements in the compound. After that predicts the ratio of elements in a compound derived from a different mass and next to train students in the understanding of the law of definite proportions of students discussing and doing exercises on worksheets that have been provided that the activity of "sharing". The final task is working on about "jumping" to predict whether comparative law still apply in some water phenomenon.

Implementation lesson plan by using sharing task and jumping task on the topic of law of definite proportions went well overall. In class X IPA 1 when the initial activity students were enthusiastic because there molymod. At its core activities, discussions are going well. Students discuss the matter of LKS with the material according to the text book level. Some students at the time of the initial observation does not focus on learning to look more focus on learning and get involved in discussions. At the end of the activities the students are given a stimulus to display some of the phenomena of water and asked whether the phenomenon of the water or not in accordance with the law of definite proportions ?. In this activity students were more enthusiastic to find answers to these problems. In the first implementation of this activity and jumping sharing his run well. There are some students who are jumping on the cover of this activity, the results of TKR he got away from her usual value. In the implementation of class X IPA 2 all the activities going on well. Even the discussions that took place when activity looks more optimal sharing of class X IPA 1. Discussions that occur not only among students but also daam groups occurred between students of different age groups. Activity sharing and jumping on two classes is achieved well.

4. CONCLUSION

Based on the findings and discussion of the obtained several conclusions related to the research questions posed as bellow:

learning obstacle are identified experienced by students in the topic of comparative law, as bellows: the students have not been able to calculate the composition of the mass of the elements of compound, students still confuse elements and compounds, the students have not been able to determine the numbers so the divider to get a comparison of the simplest, students only memorize law of definite proportions, not understand it, the students do not yet understand about the applicable calculation of the equation.

Didactic sesign on the topic of law of definite proportions can minimize the constraints faced by students. Lesson plan on law of definite proportions is compiled based Learning Obstacle (LO) were identified at the beginning of the instrument test, the learning device used as rpp, books, syllabus and the learning process itself and reinforced from the repersonalisasi of books source. The draft study presented in chapter form design and lesson design that has been adapted to the characteristics of high school students Lab. School UPI science class.

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**IMPLEMENTATION OF “LESSON STUDY” IN GROUP INVESTIGATION
COMBINED THINK TALK WRITE (GITTW) STRATEGY TO IMPROVE
COGNITIVE LEARNING OUTCOME IN BIOLOGY CLASSROOM**

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Abstract: Conventional strategies such as lectures, discussion and exercises, still dominated the pattern of biology learning at schools in Surabaya, Indonesia. The strategy was not optimal in achieving a high level of cognitive aspects of students. Learning strategy is one of aspects that determines success of learning process. The new learning strategy, Group Investigation combined Think Talk Write (GITTW) believed can increase the cognitive learning outcome effectively with the implementation of lesson study. This study was an action research based on “lesson study” that aimed to describe the implementation of “lesson study” in GITTW strategy to improve biology learning outcome of the first grade of science student in Muhammadiyah 2 senior high school in Surabaya, first semester, academic year 2014/2015. The subject of research was 32 students. The students' cognitive learning outcome was measured by essay tests were developed according to the revision of Bloom's taxonomy. The study was conducted in two cycles, each cycle consisted of two meetings. The results of the research showed that there was an improvement of cognitive learning outcome biology from first cycle to the second cycle as much as 23.2%, with a mean score at the first cycle was 59.77 and second cycle was 77.80. The final conclusion, the implementation of GITTW through “lesson study” can improve cognitive learning outcomes of students effectively. Application of “lesson study” with innovative teaching strategies such as GITTW should be used by teachers to improve cognitive learning outcomes of students.

Keywords: group investigation combined with talk think write (GITTW), cognitive learning outcome, lesson study

1. INTRODUCTION

Learning at all levels of education starting from the elementary school, junior High School, and Senior high school needs to implement the strategies which can develop students' thinking skills and cognitive skills. Thinking skills and cognitive abilities need to be developed in this 21st century. Along with the development of science and technology, the demands of 21st century education put more emphases on the quality of education. Quantitatively, the education in Indonesia is progressing, but qualitatively the education in Indonesia is still relatively low. The low quality of education can be seen from the Human Development Report Index (HDI) reported by the Board of the United Nations Development (UNDP) in 2013. On the aspect of educational achievement, Indonesia ranked 121st from 187 countries in the world. This shows that the quality of the learning process in the classroom is still low.

The low quality of learning process is also found in biology learning in several Muhammadiyah senior high schools in Surabaya, Indonesia. The results of a survey shows that conventional learning strategies in general dominate the learning process in Biology classroom. Conventional learning is a learning using conventional strategies such as lecturing method, discussion and exercises, commonly applied in Biology classroom. This learning strategy has not been optimal in developing the students' cognitive ability. The research results also reveal that, teachers make biology test just one emphases level on remembering (C1), and understanding (C2), while the high-level capabilities such as applying (C3), analyzing (C4), evaluating (C5) and creating (C6) are still lacking. The students' mean score of Biology subject as the learning outcome was 70 (Listiana, 2014). The Biology cognitive learning outcome can only be categorized as sufficient. In fact, the students' learning results is an indicator of the success of learning.

The low cognitive learning outcome of the students which can only be categorized as sufficient was probably due to learning problems in the classroom, such as the problem solving of the Biology material was not finished, and were not challenged to develop and strengthen their thinking skill and cognitive skill. Such learning conditions have occurred in some Muhammadiyah Senior High School in Surabaya.

Some efforts to overcome the above problems are required, including the implementation of the appropriate learning strategies, expected to be able to develop the high-level cognitive abilities. The learning strategy believed to be able to develop and empower high-level cognitive abilities is the GI (Group Investigation) strategy. The use of GI strategy has revealed some advantages, such as the students are (a) directly involved in acquiring knowledge; (b) not only as receivers; (c) developing interpersonal intelligence; (d) creating knowledge and developing higher order thinking skills; (e) learning higher level information when learning in cooperative groups; (f) encouraging the students to achieve higher-level thinking on learning (Mitchell et al., 2008: 389). Several researches have shown that the GI strategy has the potential to improve thinking skills and concept gaining. The research by Nasrudin and Azizah (2010) found that the implementation of GI learning strategy could increase the activity of science learning, thinking skills, and scientific attitude. Akcay and Doymus (2012) revealed that there was a difference in the learning results among the GI group, together learning group, and control group. Tan et al., (2007) reveal that there are differences in learning outcomes between the groups GI and control.

Another learning strategy expected to be able to develop high-level cognitive abilities is TTW strategy (think talk write). The strategy introduced by Huinker and Laughlin (1996) has some advantages. The advantages are it is very adaptable to changing conditions and can be applied to all areas of study at various levels, with a very simple syntax (Ansari, 2004). Research results revealed that TTW strategy could increase the activity and Biology learning outcome (Solikhah 2009; Astohar 2010; Fatmawati, 2010). TTW strategy is a strategy that is built through thinking, speaking and writing. These activities will give the students the opportunity to develop their higher cognitive abilities.

The combination of GI and TTW strategy, referred to as GITTW, is packaged in the form of cooperative learning, a new strategy that is believed to be able to develop high-level cognitive abilities that will impact students' learning outcome. This combination strategy starts from the weaknesses of GI and TTW strategies which become the consideration to combine both strategies. Both of these strategies are combined by integrating the syntax of TTW into each stage of the GI. This strategy trains the students to investigate a topic of real or theoretical issues, access information from various sources, observe, analyze, synthesize, present, and evaluate through the process of thinking, speaking and writing.

The implementation of GITTW strategy can be effectively done by implementing "lesson study". According to Syamsuri and Ibrahim (2011), the implementation of "lesson study" is an effective way to improve the quality of the teaching and learning activities. This is because the fundamental emphasis of "lesson study" is that the students who have the quality of learning and learning objectives become the major focus and concern in the classroom. In line with this, Susilo (2014) said that through "lesson study", educators can improve the quality of learning because the educators will help the learners achieve basic competencies expected and can help develop scientific thinking habits.

Learning using "lesson study" is implemented collaboratively, sustainably, based on the principle of collegiality, sharing knowledge, and build a learning community. A continuous implementation of "lesson study" can improve teachers' competence and quality of teaching and learning. Therefore, one important study on "lesson study" is a learning strategy or learning method.

This research aimed at describing the implementation of GITTW learning strategy based on "lesson study" to improve cognitive learning outcome in Biology learning. The new strategy which based on "lesson study" is expected to be used as a variation in learning and can be utilized to improve the quality of teaching and learning activities, which ultimately can improve the higher level cognitive abilities.

2. RESEARCH METHODOLOGY

This research was a classroom action research, using qualitative descriptive approach. This classroom action research was conducted by integrating “lesson study”. This research was conducted in two cycles in which each cycle consisted of four stages: planning, implementation, observation and reflection. In each *open class*, “lesson study” was conducted covering the steps of *plan*, *do*, and *see*.

The presence of the researcher in this research was as an observer who designed the learning activities or actions carried out by a team of “lesson study”. The model teacher was the biology teacher at the school where this research was conducted. This research was conducted at Muhammadiyah Senior High School 2 Surabaya, Indonesia. The research subjects were 32 students of class X natural science in the 1st half of 2014/2015 academic year. This research was carried out for 2 cycles in which each cycle consisted of two meetings. The topic of the learning material in the first cycle was “the scope of biology, the scientific method and the occupational safety”. The learning material for the second cycle was “different levels of biodiversity and the conservation efforts of biodiversity”.

The data were collected using observation, which was carried out by the relating to the students’ activity and the model teacher’s activity in the classroom action process. The data collected by observation techniques were (1) the data of the completion of the stages of “lesson study”; (2) the data of the completeness of the learning syntax of GITTW strategies and students’ activity; and (3) the data of the teacher's ability in managing the learning. The data of cognitive learning outcome were collected from the post-test at end of each cycle “lesson study”. The biology learning outcome measured by using a scoring rubric. Furthermore, the data were statistically analyzed using t-test, which were previously performed in the prerequisite tests namely, the normality test using one-sample Kolmogorov-Smirnov test and homogeneity test using Levene’s Test of Equality of Error Variances. The data were analysed using SPSS 17.0 for Windows.

3. FINDING AND DISCUSSION

a. Research Finding

In the early stage of the research, an observation was carried out to find the problems that occurred in biology classroom and the observation of students’ activity during the learning process. The next step was to make the perception of all teachers the same, therefore, a workshop on “lesson study” was conducted. It was followed by all Biology teachers of Muhammadiyah Senior High School Surabaya. The purpose of the workshop was the understanding of “lesson study” and learning strategies, so that the implementation ran smoothly.

The implementation of Classroom Action Research through “lesson study” in this research was carried out by two cycles. The “lesson study” in the Classroom Action Research was carried out for four times. The “lesson study” was carried out in groups. The summary of classroom action research activities through the “lesson study” is shown in Table 1.

Cycle 1

The planning stage (*Plan*), it was determined the learning material to be covered in the first cycle, preparing the lesson plans, worksheets, learning materials, and final test items in the first cycle (*posttest*) and the observation sheets of completeness of GITTW learning strategy, sheets of completeness of “lesson study”, sheets of the ability in managing the class. It was conducted a review and discussion of the learning material to be used. After that, the schedule of the implementation of *do* and *see* was determined.

In the stage *Do*, two meetings or two *open classes* were carried out. The first meeting discussed about “the scope of biology” with the allocation time of 2x45 minutes. The second meeting discussed about “scientific method and occupational safety” and ended with the post-test. At this time, an observation of the

students' learning activities, completeness of the learning and the learning management ability was carried out. The data were collected by the help of the observer. The results of the observations showed that the students' learning activities categorized as sufficient, because some indicators were not accomplished, as asking questions, noting the learning objectives, planning the procedures or how to solve problems, sharing tasks with other group members, and responding to the presentations of the other groups. Most of the students have learned about the topic, only the group 2 still lacked of coordination in the group work, especially the students with the number of 30, 31 and 33. From the other groups, the students with the number of 5, 14, 19, 21, and 25 were not active in the discussion, but they were very silent.

Table 1. Summary of Classroom Action Research Through “Lesson Study”

Cycles PTK	“Lesson study”	Material	Model Teachers	Observer	Implementation Time						
					Plan	Do	See				
I	1	Scope of Biology	SyuhadaIshakA bilio Gomes, S.Pi., M.Pd.I	1. Ir.Hj. WedyasningWula ndari, MM. 2. Rufiah, S.Pd 3. TitisPermatasari, S.Pd 4. Dra. Lina Listiana, M.Kes	Selasa, 12-08-2014 (12.00-13.00)	Rabu, 13-08-2014 (08.30-10.00)	Rabu, 13-08-2014 (10.00-11.00)				
					2	Scientific Method and Occupational Safety	SyuhadaIshakA bilio Gomes, S.Pi., M.Pd.I	1. Ir.Hj. WedyasningWula ndari, MM. 2. Rufiah, S.Pd 3. TitisPermatasari, S.Pd 4. Dra. Lina Listiana, M.Kes	Selasa, 19-08-2014 (12.00-13.00)	Rabu, 20-08-2014 (08.30-10.00)	Rabu, 20-08-2014 (10.00-11.00)
									3	Different Level Biodiversity	SyuhadaIshakA bilio Gomes, S.Pi., M.Pd.I
II	4	Biodiversity Conservation	SyuhadaIshakA bilio Gomes, S.Pi., M.Pd.I	1. Hj. Sri Suhartini,S.Pd 2. Rufiah, S.Pd 3. IstianahHajar, S.Pd. 4. Dra. Lina Listiana, M.Kes.	Selasa, 02-09-2014 (12.00-13.00)	Rabu, 03-09-2014 (08.30-10.00)	Rabu, 03-09-2014 (10.00-11.00)				

The reflection stage (*See*) it was obtained a sufficient result, that is, the learning activities had run quite well. The model teacher gave his impression and opinion about GITTW strategy that was implemented, the strategy was quite fun because the students worked cooperatively, teachers did not do many lecturing activities. The GITTW strategy needs an explanation to the students about the syntax of GITTW strategies, so that the students did not have any difficulty. This strategy requires a considerable amount of time, especially during the discussion, so it needs a time management for each step of the syntax. The observer noted that the students, who are not active during the learning and discussion, need to be directed and guided in completing the students' worksheets, plan the procedures or how to resolve the problem and the division of the group assignments. The obstacles in the implementation of this research were the limited number of the textbooks.

Based on the results of the observations during the first cycle, there were some things that need to be improved, namely (1) the organization of learning time so that it becomes more efficient; (2) needs an explanation of the syntax of GITTW, the students are led and directed step by step; (3) the time management of each stage of the syntax need to be reviewed for the accomplishment of the learning; (4) model teacher needs to manage the groups, so that each group can work more effectively. The weaknesses in the reflection phase of the first cycle were then improved in the second cycle.

The results of the post-test given at the end of the cycle found that the mean score of the Biology cognitive learning outcome in cycle 1 was 59.77. These results were categorized as sufficient and it would be improved in the second cycle.

Cycle II

The planning stage (*Plan*), it was determined about the learning material that would be discussed at the second cycle and the review and discussion of learning tools. Discussion and sharing which put more emphases on the improvement of the shortcomings in the first cycle was done. Prepare the final test items for the second cycle II (post-test), and research tools. After that, the schedule for the *do* and *see* was determined.

The implementation stage (*Do*) was done for two times of *open class*. The first meeting in this second cycle discussed about “various levels of biodiversity”, followed by the second meeting with “conservational efforts of biodiversity”, each with 2x45 minute time allocation, and then it was ended with the post-test of the second cycle. At this time, observations of the students' learning activities and the completeness of the learning, completeness of the “lesson study”, and the learning management ability were carried out. The results observation showed that the management of the group work activity had been performing well, so that the activities of students in group II appeared to have been able to work together in a group. In the group, the students with number 5, 14, 19, 21, 25, 30, 31, and 33 had shown seriousness in learning.

The stage of reflection (*See*), it was obtained some good results, such as, (1) the learning had been done properly in accordance with the time allocation for each syntax; (2) the students had begun to be active in discussion, coordination and cooperation among groups had started to work well, they planed the ways of task completion (worksheets) and divided tasks within their groups, the students actively asked and gave feedback during the class discussions; (3) each syntax of GITTW was well implemented in accordance with the time allocation, with the simplification of the evaluation phase to be done at home if time not enough. Although there were still some shortcomings, there had been an increase from the first cycle to the second cycle, so that there was no need to proceed to the next cycle.

Through the “lesson study”, in the second cycle, the model teacher could correct some weaknesses in each meeting. One of the weaknesses in the second cycle was the time management of each step of the syntax of GITTW which already ran well. The students' learning activity became very effective. The students became more enthusiastic in learning with the implementation of GITTW based on “lesson study”. The results of the posttest in cycle II showed that the mean score of Biology cognitive learning outcome was 77, 80. These results were classified as good category, and will continue to be improved to obtain maximum results.

Completeness of The Steps of “Lesson Study”

The results of the completeness of the “lesson study” are shown in Table 2.

Table 2. The Monitoring Results of the Completeness of The Steps of “Lesson Study”

Lesson Study	Scores of the Completeness of the Stages of Lesson Study			Criteria
	Plan (%)	Do (%)	See (%)	
1	92,6	90	92,6	very accomplished
2	100	95	92,6	very accomplished
3	100	95	100	very accomplished
4	100	100	100	very accomplished
Average	98,15	95	96,3	very accomplished

Table 2 shows that all steps of “lesson study” has been carried out well. The mean of the completeness of the stage *plan* was 98.2%, stage *do* was 95% and the stage *see* was 96.3% ,in which all steps can be categorized as very accomplished.

The Completeness of GITTW Learning

The results of the observation of the completeness on the implementation GITTW strategy are shown in Table 3, and the results of students’ activities in the GITTW learning strategy are shown in Table 4.

Table 3. The Monitoring Results of The Completeness of GITTW Learning Strategy

Cycles	Lesson Study 1	Lesson Study 2	Average	Criteria
	Percentage	Percentage		
I	81	90	85,5	very accomplished
II	90,5	100	95,25	very accomplished
Average	85,75	94,5	90,1	very accomplished

Table 3 shows that there the syntax GITTW has already well accomplished. The mean of the completeness in the first cycle and the second cycle in the “lesson study” 1 and 2 can be categorized as very accomplished.

Table 4. The Monitoring Results of The Students’ Activities in The GITTW Learning Strategy

Cycles	Lesson Study 1	Lesson Study 2	Average	Criteria
	Percentage	Percentage		
I	70	85	77,5	materialize
II	89	95	92	very accomplished
Average	79,5	90	84,75	very accomplished

Table 4 shows that the students’ activity in the GITTW learning strategy already performed well. The mean of the students’ activity of students in the first cycle and the second cycle had run well. Similarly, the first “lesson study” was implemented well, and the second *lesson study* can be categorized as very accomplished.

Teacher’s Ability in Managing The Learning Using GITTW Strategy

The results of the observation of the teacher's ability in managing the learning by using GITTW strategy are shown in Table 5.

Table 5. The Monitoring Results of Learning Management Using GITTW Strategy

Cycles	Teachers learning management ability Scores		Average	Criteria
	<i>Lesson Study 1</i>	<i>Lesson Study 2</i>		
	I	3,58		
II	3,83	3,97	3,9	good
Average	3,71	3,82	3,77	good

Table 5 shows that teacher’s learning management ability using GITTW strategy in the first cycle and in the second cycle was categorized as good, similarly, in the “lesson study” 1 and “lesson study” 2 were categorized as good.

Students’ Cognitive Learning Outcome by Using GITTW Strategy

The results of normality test of the students’ biology cognitive learning outcome data using one-sample Kolmogorov-Smirnov test showed that the data were distributed normally ($p > 0.05$) and homogeneity test using Levene’s Test of Equality of Error Variances showed that the data were homogeneous ($p > 0.05$).

The results of the t-test of the biology cognitive learning outcome by using GITTW strategy are shown in Table 6 and Table 7.

Tabel 6. Group Statistic

value	cycle	N	mean	Std.deviation	Std. Error
					Mean
	cycle 1	32	59.7656	7.92758	1.40141
	cycle 2	32	77.7969	7.32853	1.29551

Table 7. Independent Samples Test

	Levene’s Test for Equality of Variances	t-test for Equality of Means								
		F	Sig.	t	df	Sig (2 tailed)	Mean Difference	Std.Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
									Equal variances assumed	.017
Nilai Equal variances not assumed			-9.448	61.621	.000	-18.03125	1.90848	-21.84625	-14.21625	

Table 6 and 7 show that the biology cognitive learning outcome from the first cycle to the second cycle increased as much as 23.2%, with a mean score of the cognitive learning in the first cycle 59.77 and in the second cycle 77.80.

The implementation of “lesson study” in the classroom action research in general increased the students’ Biology cognitive learning outcome. Based on the results of the completeness of the syntax, the

implementation of GITTW strategy reached 90.1% and the completeness of the “lesson study” reached 96.3%. This indicates that the learning activity had been carried out very well.

The completeness of the learning in cycle I and cycle II of the classroom action research, in which there were “lesson study” (2 meetings) in each cycle. In the implementation of Plan stage, in general, the plan stage had been implemented very well, and it showed an increase. The mean in cycle I was 96.3%, and the mean in cycle II was 100%. At this stage, all of the learning materials had been prepared, so that the emphasis was given on the discussion and sharing understanding of the learning material to be used. At the *Do* stage, the mean of the completeness of cycle I reached 92.5%, and the second cycle was 97.5%. This showed that this stage had been successfully carried out, although there were weaknesses in the time management of each stage of the syntax of the learning strategy used and the lack of group coordination, especially in cycle I. In the second cycle, there was an improvement, in that the time management could be done well and the group coordination was effective. After that, the implementation of stage *See*, in general, had already been very well and had improved, in which in the first cycle the mean of the completeness was 92.6% and the second cycle was 100%. The stage *See* was carried out immediately after the stage *Do*. This made the process of stage easier in that the results of observation were immediately discussed, so that many things can still be remembered during the stage *Do*. Stage *See* in cycle II, the learning had run very well and it was in accordance with the allocation time. In general, the students’ activity, time management, and group coordination had increased. Similarly, the ability of the model teacher in the learning management both in cycle I and cycle II as well as in open class 1 and 2 were categorized as good.

The implementation of “lesson study” in the learning process was the right step to improve the quality of learning. “Lesson study” actualize the *PP No.19 of 2005* that the learning process should be interactive, inspiring, fun, challenging, motivating to be active, creative, innovative, self-contained, in accordance with talents, interests, and the development of students. This also helps improve the competence of teachers in accordance with the Republic Act No.14 of 2005. It is in line with Lewis (2004) stating that through the lesson study, teachers will get some benefits (1) they can think carefully about the objective and the material to be taught to students; (2) they can assess the best things that can be used in learning by learning from the other teachers; (3) They can learn from the learning material of the other teachers ; (4) they can develop their expertise in teaching ; and (5) they can develop “the eyes to see students”. Suparlan (2009) also states that “lesson study” provides an advantage for teachers, in that by practicing “the best practices”, the teachers will train and try to produce innovations in learning.

The completeness of the learning in each stage of the syntax of GITTW in the cycle I and cycle II had already run well. This shows that the learning materials that have been developed could be implemented and could help the students to understand the subject matter. The Biology learning materials that were developed by using GITTW strategy included the syllabi, lesson plans, students’ worksheets, and evaluation instruments. The review of the learning materials using GITTW strategy of cycle I yielded some improvements, such as; (1) the implementation time on the evaluation stage was matched with the available time. At this stage, there were some test items relating to the material discussed, thus for the implementation it could be directly done or it could be used as homework; (2) sharing the results of the discussions between groups was not done after the completion of each stage of the syntax, but it was done after a two-stage or three-stage syntax. This was done to make the time effective, so that the syntax of the learning strategies could be implemented well.

The learning materials of GITTW strategy were developed in accordance with the demands of 21st century education that focuses on improving thinking skills and a high level of cognitive ability. This is in line with Ibrahim (2012) who proposed that some of the principles in preparing *lesson plan* in the implementation of “lesson study” were (1) developing a learning that is active, creative, effective and fostering the self-reliance of students; (2) achieving high-level cognitive abilities; (3) develop the ability to express

ideas/opinions with a sense of responsibility, confidence and other affective aspects; (4) developing and implementing of innovative learning process.

Learning using GITTW strategy-based on "lesson study" also showed that the students' activity during the learning process had run well. It could be seen from the higher number of the students who asked, commented or helped answer questions. The discussion process in the group ran smoothly and effectively, as well as the presentations and question and answer session. The students' activity during the learning process with GITTW strategy in cycle I was quite accomplished. After that, in cycle II, the students' activity in asking and group work in accordance with the stages of the syntax had already run well.

The completeness of GITTW learning strategy with the implementation of "lesson study" could not be separated from the teacher's role as the manager of learning. In the implementation of cycle I and cycle II, the teacher's ability in managing the learning was quite good. It could be seen from the management of the learning activities from the beginning until the end of the activities was carried out well. The teacher's role is very important in determining the quality of the learning, and therefore the ability of teachers must continue to be honed in terms of pedagogic competence, professional competence, personal competence and social competence. Through sustainable "lesson study", teacher's ability to teach, manage learning and design learning will be trained. It is will be an increase the quality of the learning process.

The completeness of the syntax of GITTW already had run very well and characterized as very accomplished. It showed that the learning activity had run as expected. An increase in the students' cognitive learning outcome was from the strategy implemented. The cognitive learning outcome of the students who were taught by using GITTW strategy showed that there was an increase in students' Biology cognitive learning outcome from cycle I to cycle II as much as 23.2%, with the mean score of the cognitive learning in cycle I as much as 59.77 and cycle II as much as 77.80. These results show that the learning activity using GITTW strategy can help students improve students' cognitive abilities.

GITTW learning strategy had an effect on students' Biology cognitive learning outcome. The stages of GITTW strategy have the characteristics and advantages in achieving the aspects of students' cognitive abilities. GITTW strategy is the combination of GI strategy and TTW strategy which are packaged in the form of cooperative learning. In the GITTW learning strategy, where TTW strategy is integrated into GI strategy, with the aim to complement each other's weaknesses and to optimize students' cognitive ability in Biology learning process. This combination of these strategies gives the strength in stimulating the students' cognitive activities during the learning process, such as identifying topic, planning and dividing tasks and solving problems. GITTW strategy is believed to be a new cooperative model that has enormous potential to empower cognitive abilities. This strategy consists of a combination of syntax that is expected to help students to improve their cognitive learning results.

GI strategy has the advantages in improving learning outcome, that is, it can help students understand difficult concepts. According to Sharan&Sharan (1992) GI strategy is learning where students experience meaningful learning because they are faced with the steps of scientific inquiry. Slavin (2005) also affirmed that through GI strategy, students are active in constructing their own knowledge. It will be easier to construct concept understanding if they share in learning. Several other studies agree that the GI strategy helps students develop cognitive abilities, because this model involves the skills of high-level thinking in resolving tasks (Santyasa, 2008). GI strategy is also more potential in empowering students' thinking skills (Nasrudin&Azizah, 2010; Listiana, 2013). GI strategy has an effect on creative thinking skills and concept understanding of Biology (Suartika et al, 2013; Sudewi, 2014). The research by Akcay and Doymus (2012) revealed that there was a difference in learning results among GI groups, learn together and control group. Nasrudin and Azizah (2010) found that GI strategy could increase science learning activity and thinking skills as well as scientific attitude.

GITTW strategy is inseparable from TTW strategy. In addition to the stages of GI strategy that encourages the development of students' metacognitive skills, it is also strengthened by the

integration TTW strategy at every stage of the GI. TTW strategy, with its syntax, is able to improve students' cognitive learning outcome, as seen in the activity of think, talk, and write which requires higher thinking skills. Students are required to integrate their cognitive abilities when they observe images or video, watch discourse, then discuss and make a report. All of these activities will enable the students to develop their thinking skills which will significantly improve their learning outcome. Several researches conducted by Sholikhah (2009) and Astohar (2010) in the fields of biology, Juniasih (2012), Paulina (2012) and Sulistyarningsih (2012) in the field of mathematics, revealed that the implementation of TTW learning strategy was more effective in improving students' learning outcome.

GITW strategy was proven to improve Biology learning outcome. The combination of these strategies provides a greater opportunity to empower students' cognitive abilities, improve their high thinking skills that will ultimately improve their Biology learning outcome.

The findings of research show that the implementation of "lesson study" using GITW strategy can optimize the empowerment of students' cognitive abilities and improve their cognitive learning outcome. The completeness of the stages of "lesson study", the completeness of the syntax of GITW, and students' activities in the learning process ran very well.

4. CONCLUSION

From the results of the research, it can be concluded that the implementation of GITW strategy in biology learning was done effectively through "lesson study" and can improve students' cognitive learning outcome. The completeness of the stages of "lesson study" can be accomplished well, and the completeness of the syntax of GITW learning strategy, and the students' activity ran very well. Similarly, the teachers' learning management ability of GITW strategy can be categorized as good.

Suggestions: (1) the implementation of "lesson study" in learning should be carried out periodically and sustainably, so that it will be able to improve the professionalism of the teachers and pedagogical competence; (2) GITW strategy can be used by teachers as one of the development strategy of cooperative learning and as a variation of learning strategy that can empower students' cognitive abilities and improve their Biology learning outcome.

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IMPLEMENTASI LSLC (*Lesson Study For Learning Community*) UNTUK MENINGKATKAN KOLABORASI ANTAR SISWA DAN KUALITAS PEMBELAJARAN BIOLOGI DI SMAN-1 PALANGKA RAYA

(Implementation of LSLC to Improve of Students Collaboration and the Quality of Biology Learning in SMAN-1 Palangka Raya)

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Abstract: SMAN-1 Palangka Raya is the one of favorite high school and also as barometer of education quality at high school level in Central Kalimantan. This school chosen as a partner school, so that in the future can be a piloting school for the LSLC implementation in Central Kalimantan. Implementation of LSLC in this school, is expected gradually lead to the better academic and learning atmosphere, in order to prepare the students for life in the 21st century. Purposes of this LSLC implementation are: to improve collaboration between students and biology learning quality in SMAN- 1 Palangka Raya. The research method is action research with the steps Plan-Do-See, in class XI-4 IPA, starting from June to October 2016. The results showed LSLC implementation can enhance collaboration in the form of activities: hear to each other, cooperate with each other, help each other, and give each other feedback among the students, and can improve the quality of biology learning, in the form of increased activity of hands on, minds on, and students learning outcomes of class XI IPA SMAN-1 Palangka Raya.

Keywords: LSLC, Students Collaboration, the quality of learning biology

Abstrak: SMAN-1 Palangka Raya adalah salah satu SMA favorit dan sekaligus barometer kualitas pendidikan pada jenjang SMA di Kalimantan Tengah. Sekolah ini dijadikan sebagai sekolah mitra, agar kedepannya dapat menjadi *piloting school* pelaksanaan LSLC di wilayah Kalimantan Tengah. Implementasi LSLC di sekolah ini, diharapkan mampu secara perlahan mengarah pada atmosfer akademik dan atmosfer belajar yang lebih baik, dalam rangka mempersiapkan para siswa menghadapi kehidupan di abad ke 21. Tujuan implementasi LSLC adalah: untuk meningkatkan kolaborasi antar siswa dan kualitas pembelajaran biologi di SMAN-1 Palangka Raya. Metode penelitian adalah kaji tindak dengan siklus *Plan-Do-See*, pada kelas XI-4 IPA, mulai Juni - Oktober 2016. Hasil penelitian memperlihatkan Implementasi LSLC dapat meningkatkan kolaborasi dalam bentuk kegiatan saling mendengar, saling bekerjasama, saling membantu, dan saling memberi masukan pada siswa, dan dapat meningkatkan kualitas belajar biologi, dalam bentuk peningkatan aktivitas *hands on, minds on*, dan capaian belajar siswa kelas XI IPA SMAN-1 Palangka Raya.

Kata Kunci: LSLC, kolaborasi antar siswa, kualitas pembelajaran biologi

1. PENDAHULUAN

SMA Negeri 1 Palangka Raya, berlokasi di Jl. A.I.S Nasution No. 02 Palangka Raya. Sekolah ini berdiri sejak tahun 1959, sudah meluluskan ribuan alumni, dan saat ini telah berhasil memperoleh peringkat akreditasi A (Profil SMAN-1, 2015). Sekolah ini merupakan salah satu sekolah favorit, dan menjadi salah satu barometer kualitas pendidikan di jenjang SMA di wilayah Kalimantan Tengah. Secara umum, kualitas pendidikan di sekolah ini rata-rata telah lebih baik dibandingkan dengan mayoritas SMA lain yang ada di wilayah Kalimantan Tengah.

Sekolah ini dijadikan sebagai sekolah mitra, agar kedepannya dapat menjadi *piloting school* pelaksanaan LSLC di wilayah Kalimantan Tengah. Guru biologi yang dilibatkan dalam kegiatan LSLC di sekolah ini sebanyak 5 orang. Mereka rata-rata merupakan para guru senior yang telah mendapatkan

pengalaman pelatihan di bidang pendidikan baik di tingkat lokal hingga tingkat nasional. Antusiasme guru dalam mengajar maupun dalam menerapkan hal-hal yang baru cukup tinggi. Kepala sekolah juga memiliki pandangan dan dukungan yang baik untuk melakukan kerjasama dalam rangka meningkatkan kualitas pendidikan di SMAN-1 Palangka Raya. Para siswa, yang merupakan input sekolah, merupakan siswa yang telah lolos dari seleksi yang cukup ketat, karena sekolah ini merupakan salah satu sekolah favorit.

Beberapa kendala yang dihadapi terkait pelaksanaan LSLC di SMAN-1 Palangka Raya adalah: 1) jumlah siswa per kelas yang melebihi kapasitas (untuk kelas XI rata-rata > 40 siswa/ kelas), sehingga bangku siswa dalam posisi yang cukup berdekatan, dan kurang menunjang saat pengelompokkan dan diskusi kelompok berlangsung. 2) Kelas yang ada, sering digunakan untuk kegiatan PPL-2 (Praktek Pengalaman Lapangan, bagi para calon guru, dari berbagai universitas, dan jurusan), 3) guru sering terikat untuk mengejar/menyelesaikan materi sesuai kurikulum, maupun berbagai tugas lain, sehingga kesulitan membagi waktu untuk melakukan tahapan PLAN bersama-sama dengan pihak lain.

Para siswa kebanyakan merupakan orang-orang terpilih, yang rata-rata memiliki kemampuan akademis memadai. Berdasarkan hasil observasi, kemampuan akademis yang dimiliki oleh sebagian besar siswa, masih kurang ditunjang dengan attitude yang baik saat belajar, sifat individual dan kurang peduli masih terlihat lebih menonjol, dan banyak siswa lepas dari perhatian guru. Implementasi LSLC di sekolah ini, diharapkan mampu secara perlahan mengarah pada atmosfir akademik dan atmosfir belajar yang lebih baik, lebih demokratis, lebih kolaboratif, dimana siswa dapat saling bekerjasama, saling bertoleransi, untuk mencapai kemajuan bersama. Para guru diharapkan dapat saling belajar, saling memberi masukan untuk kemajuan yang lebih baik, dalam rangka mempersiapkan para siswa untuk menyongsong kehidupan di abad ke 21.

Menurut Sato (2016) LSLC bertujuan untuk mewujudkan hak-hak belajar setiap siswa, mengembangkan profesionalitas diantara semua guru, dan mempersiapkan masyarakat yang demokratis. Fokus dari LSLC bukanlah pada bagaimana guru mengajar, namun lebih pada bagaimana siswa belajar, dengan kata lain, bukan difokuskan pada merencanakan dan mengevaluasi pengajaran, namun lebih difokuskan pada perancangan dan refleksi dari kegiatan pembelajaran. Pada sekolah-sekolah secara umum, biasanya para guru lebih focus pada analisis materi, perencanaan pembelajaran, dan keterampilan-keterampilan dalam mengajar, namun dalam LSLC para guru diharapkan lebih focus pada aktivitas belajar dan relasinya pada siswa. Sekolah abad 21 harus menjadi sebuah "learning community" dimana setiap siswa memiliki akses yang sama.

Salah satu parameter dalam penelitian ini adalah kolaborasi antar siswa. Kemampuan siswa dalam berkolaborasi sangat penting untuk dilatih dan ditingkatkan, karena aspek kolaborasi merupakan salah satu kompetensi penting yang harus dimiliki dalam memasuki kehidupan di abad ke 21. Sekolah diharapkan mampu mempersiapkan siswa untuk menghadapi kehidupan di abad 21.

Pembelajaran kolaboratif yang diterapkan dalam LSLC adalah:

- 1) Belajar berpasangan maupun dalam kelompok kecil.
- 2) Kelompok kecil harus terdiri dari anggota yang heterogen jenis kelamin, kemampuan, latar belakang budaya dan sosialnya.
- 3) Kolaboratif learning memiliki dua fungsi utama yakni berbagi (*sharing*) ide satu dengan yang lain, dan melompat (*jumping*) dengan membangun struktur dari ide-ide yang lain.
- 4) LSLC biasanya diorganisasi dalam dua tahapan kolaboratif learning dalam sebuah pembelajaran, yakni: level teksbook (*Sharing task*), dan level yang lebih lanjut (*advanced*)(*Jumping task*).

Parameter lain dalam penelitian ini adalah peningkatan kualitas pembelajaran biologi, yang ditinjau dari dua aspek utama yakni optimalisasi aktivitas *minds on* dan *hands on*. Aktivitas manusia dibedakan menjadi dua hal yakni *Mind On* dan *Hands On*. Aktivitas *Minds On* adalah aktivitas yang mengandalkan otak, sedangkan aktivitas *Hands on* adalah aktivitas psikomotorik yang mengandalkan pergerakan otot tubuh. Berpikir dianggap sebagai suatu proses kognitif, suatu aktivitas mental untuk memperoleh pengetahuan.

Minds-on atau keterampilan berpikir termasuk ke dalam ranah kognitif. Istilah kognitif ini erat kaitannya dengan konsep intelektual atau intelegensia. Aktivitas *hands-on* adalah sebuah aktifitas dalam pembelajaran dimana siswa diberi keleluasaan untuk berinteraksi dengan objek yang dipelajari dengan melibatkan beberapa keterampilan proses yang mengiringi interaksi tersebut. Dalam sains, keterampilan-keterampilan tersebut disebut keterampilan proses sains. Aktivitas *minds on* dan *hands on* ini penting diberikan dan ditingkatkan dalam proses belajar siswa, untuk melatih keterampilan berpikir, mengatasi masalah, meningkatkan kreativitas, dan agar pembelajaran menjadi lebih bermakna.

2. METODE PENELITIAN

Jenis Penelitian

Penelitian ini merupakan penelitian kaji tindak dengan siklus penelitian: PLAN-DO-SEE, pada satu kelas biologi di jenjang SMA.

Waktu dan Tempat Penelitian

Penelitian dilaksanakan mulai Juni 2016 – Oktober 2016, berlokasi di kelas XI IPA SMAN-1, Jl. A.I.S. Nasution, Palangka Raya, Kalimantan Tengah.

Prosedur Penelitian

Perencanaan: meliputi pengurusan perijinan dengan pihak Kepala Sekolah, dan persetujuan dari guru guru biologi yang terlibat dalam kegiatan.

Sebelum LSLC:

Observasi kegiatan pembelajaran yang sehari-hari dilakukan oleh guru biologi di sekolah, dan aktivitas siswa dalam belajar

Tahapan LSLC:

- 1) PLAN: merancang rencana kegiatan pembelajaran, bersama-sama guru biologi dan rekan sejawat dari dosen Pendidikan Biologi FKIP Universitas Palangka Raya. Perencanaan meliputi: a. penetapan tujuan pembelajaran yang memberi peluang kepada siswa untuk mengoptimalkan aktivitas *hands on* dan *minds on* dalam kegiatan pembelajaran; b. penyisipan *sharing task* dan *jumping task* pada RPP; c. pengaturan pengelompokkan siswa; d. Pengaturan tempat duduk.
- 2) DO: guru model melaksanakan kegiatan pembelajaran sesuai dengan RPP yang telah dirancang bersama.
- 3) SEE: Dosen dan guru lainnya mengobservasi kegiatan/aktivitas siswa selama belajar.
- 4) REFLEKSI: evaluasi kegiatan/aktivitas siswa selama belajar, yang dilakukan oleh dosen dan guru biologi, untuk memberikan komentar dan masukkan dalam rangka perbaikan kepada guru model.

Parameter Penelitian:

Data kolaborasi antar siswa berdasarkan hasil observasi dan video pembelajaran. Bentuk kolaborasi yang dimaksud meliputi kegiatan: saling bekerjasama, saling memperhatikan, berbicara terkait topik, bertanya kepada temannya, mendengarkan temannya, menulis hasil diskusi, berbagi tugas dalam presentasi. Penilaian kualitas pembelajaran meliputi optimalisasi *hands on*, *minds on*, *sharing tasks*, *jumping tasks*, penggunaan waktu dalam belajar, dan capaian hasil belajar siswa.

Analisis Data:

Data yang dikumpulkan, dianalisis secara deskriptif kualitatif dan kuantitatif.

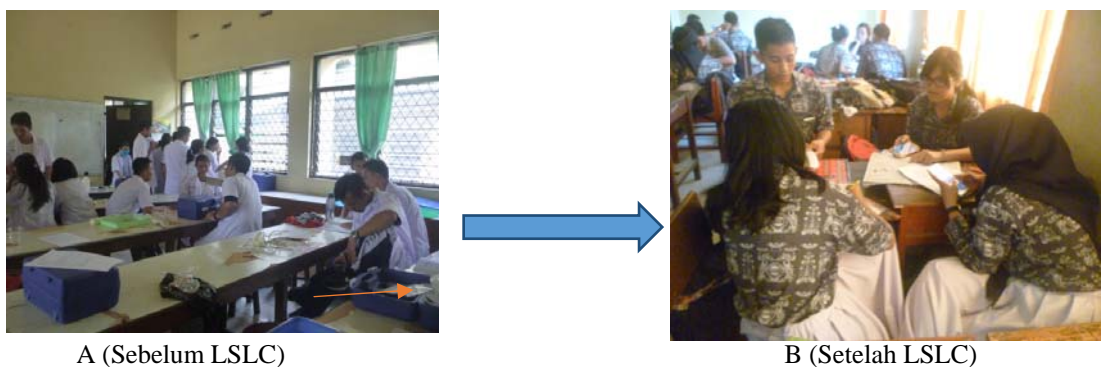
3. HASIL PENELITIAN DAN PEMBAHASAN

Hasil implementasi LSLC memperlihatkan adanya peningkatan kolaborasi antar siswa dalam hal saling bekerjasama, saling membantu, mendengarkan teman bicara, berbicara/memberi masukkan, dan berbagi tugas saat presentasi (Tabel 1).

Tabel 1. Kolaborasi Antar Siswa pada Pembelajaran Biologi di Kelas XI-4IPA SMAN-1Palangka Raya

No.	Indikator	Sebelum LSLC	Setelah LSLC
1.	Pembagian kelompok	6 – 8 siswa/ kelompok	4 siswa/ kelompok
2.	Anggota Kelompok	Kurang heterogen	Heterogen
3.	Posisi duduk	Tidak semua berhadapan	Berhadapan
4.	Kolaborasi antar siswa:		
	a. Saling bekerjasama	< 25 %	> 60 %
	b. Saling membantu	< 25 %	> 50 %
	c. Mendengarkan teman bicara	< 15 %	> 60 %
	d. Berbicara, memberi masukan	20 %	50 %
	e. Berbagi tugas saat presentasi	0 %	60 %

Pengaturan keanggotaan dalam kelompok yang heterogen, serta posisi duduk yang saling berhadapan sangat membantu para siswa dalam berinteraksi satu dengan yang lainnya (Gambar 1-3).



Gambar 1. Beberapa siswa kurang peduli terhadap kelompok dan tugas yang diberikan guru (A), Siswa bekerjasama dengan penuh tanggung jawab dalam kelompoknya (B)



Gambar 2. Siswa bekerja sendiri-sendiri dalam kelompoknya (A); Siswa saling memperhatikan dan memberi masukan satu dengan lainnya (B)



A (Sebelum LSLC)

B (Setelah LSLC)

Gambar 3. Siswa masih ada yang terabaikan atau menyendiri saat proses diskusi kelompok berlangsung (A); Semua siswa mendapat haknya dalam belajar(B)

Berdasarkan hasil observasi dan refleksi, diketahui bahwa kolaborasi antar siswa yang terjadi saat implementasi LSLC lebih baik dibandingkan dengan sebelum LSLC. Berdasarkan gambar 1-3, memperlihatkan perbedaan respons siswa dalam belajar. Siswa tampak lebih antusias, saling peduli, dan saling memperhatikan pada posisi kolaborasi di kelas LSLC, sementara sebelum implementasi LSLC masih tampak adanya siswa yang kurang peduli bahkan terabaikan dalam kegiatan pembelajaran. Pengelompokkan siswa dalam kelompok-kelompok kecil (4 orang) yang heterogen, dengan posisi meja dan tempat duduk berhadapan, membantu dalam meningkatkan efektivitas interaksi antar siswa. Kolaborasi antar siswa kelas XI SMAN-1 Palangka Raya, masih perlu dilatih dan ditingkatkan.

Peningkatan kemampuan siswa dalam berkolaborasi penting dilakukan guru dalam rangka mempersiapkan para siswa menghadapi perkembangan jaman di abad ke 21. Menurut Zamroni (2011), Pembelajaran dalam konteks abad 21, menekankan pada: 1) pembelajaran dengan pemahaman yang mendalam, 2) pembelajaran otentik, 3) kolaborasi, 4) memanfaatkan pengetahuan dan pengalaman yang telah diperoleh untuk memperoleh pengetahuan dan pengalaman baru, 5) mengorganisir pengetahuan dengan basis konsep kunci, dan keterkaitan antar konsep. Menurut Lev Vygotsky, siswa dapat belajar lebih dengan pasangannya dibandingkan dengan belajar sendiri. Sato dalam Pusawiro (2015), menyatakan: pembelajaran kolaboratif dalam LSLC merupakan sebuah hubungan saling mendengarkan, *jumping task*, dan pembelajaran autentik. Pendidikan sekolah pada abad ke 21 dicirikan oleh kurikulum yang berbasis proyek dan pembelajaran kolaboratif.

Implementasi LSLC juga meningkatkan kualitas pembelajaran biologi di SMAN-1 Palangka Raya. Peningkatan kualitas pembelajaran ini, dinilai dari beberapa hal, yakni: 1) optimalisasi *hands on* siswa selama pembelajaran; 2) optimalisasi *minds on*; 3) efektivitas penggunaan waktu; dan 4) capaian pembelajaran (Tabel 2).

Tabel 2. Kualitas Pembelajaran Biologi (Teori) di kelas XI-4 IPA SMAN -1 Palangka Raya

No.	Indikator	Sebelum LSLC	Setelah LSLC
1.	Optimalisasi Hands On siswa selama pembelajaran:		
	a. Membaca/ melihat PPT/ video	Ada	Ada
	b. Mendengarkan	Ada	Ada
	c. Menulis	Ada	Ada
	d. Menggambar	Sedikit	Ada
	e. Mempraktekkan	Tidak Ada	Mulai disisipkan

	f. Mendemonstrasikan	Jarang Ada	Ada
	g. Mengamati	Ada	Lebih ditingkatkan
	h. Mengkomunikasikan hasil	Jarang, hampir tidak ada	Ada
2.	Optimalisasi Minds On siswa selama pembelajaran:		
	a. <i>Sharing tasks</i> :		
	Memberi penjelasan	Ada	Ada
	Menjelaskan hubungan	Ada	Ada
	Menjelaskan sebab-akibat	Ada	Ada
	Mendeskripsikan	Ada	Ada
	b. <i>Jumping tasks</i> :		
	Menganalisis peristiwa berdasarkan gambar/ masalah	Kurang diterapkan	Mulai dilatih
	Berargumentasi	Kurang diterapkan	Mulai dilatih
	Memberi solusi/ mengatasi permasalahan	Kurang diterapkan	Mulai dilatih
	Menemukan ide terkait alternatif jawaban	Kurang dibiasakan	Mulai dibiasakan
3.	Efektivitas Penggunaan waktu	70%	80 %
4.	Capaian belajar siswa	70 %	85 %

Berdasarkan tabel 2, diketahui telah terjadi peningkatan optimalisasi pemanfaatan *hands on* dan *minds on* siswa selama implementasi LSLC. *Hands on* meliputi aktivitas fisik, psikomotorik, yang melibatkan indera siswa dalam belajar. Implementasi *hands on* dalam di kelas teori biologi, masih jarang dilaksanakan, karena masih ada pembagian jadwal teori dan jadwal praktikum pada pembelajaran biologi. Melalui kegiatan LSLC ini, diharapkan pemisahan jadwal, tidak mengurangi hak siswa untuk mendapatkan pengalaman belajar melalui aktivitas motorik dengan terlibat langsung pada objek yang sedang dipelajari. Guru-guru biologi setempat akan terus didampingi untuk meningkatkan kreativitas dan inovasi dalam menghadirkan media yang dapat meningkatkan aktivitas *hands on* siswa. Merujuk pada teori pendidikan yang menyatakan bahwa pembelajaran akan semakin bermakna bagi siswa jika siswa lebih banyak mengalami atau terlibat langsung dengan objek yang sedang dipelajari. Jika hanya melihat atau mendengar saja, akan lebih cepat untuk dilupakan oleh siswa. Menurut Haury dan Rillero (1994) bahwa *hands on* dalam pembelajaran adalah seluruh aktivitas dan pengalaman langsung peserta didik dengan fenomena alam.

Aktivitas *Hands on* berkaitan dengan kegiatan psikomotorik. Dalam aktivitas *hands on* akan terbentuk suatu penghayatan dan pengalaman untuk menetapkan suatu pengertian (penghayatan) karena mampu membelajarkan secara bersama-sama kemampuan psikomotorik (keterampilan), pengertian (pengetahuan) dan afektif (sikap), terhadap apa yang dipelajari, sehingga apa yang diperoleh oleh peserta didik tidak mudah dilupakan. Dengan *hands on* activity peserta didik akan memperoleh pengetahuan tersebut secara langsung melalui pengalaman sendiri. Menurut Tawil dan Liliarsari (2014), proses belajar mengajar hendaknya mengikutkan siswa secara aktif, guna mengembangkan kemajuan siswa antara lain keterampilan mengobservasi, menginterpretasikan, memprediksi, mengaplikasikan konsep, mengklasifikasikan, merencanakan, menggunakan alat, dan melaksanakan penelitian serta mengkomunikasikan hasil penemuannya.

Peningkatan aktivitas *minds on* siswa dilaksanakan melalui 2 tahapan kegiatan dalam LSLC, yakni: *sharing task* dan *jumping task*. Kedua kegiatan ini, sama-sama menekankan pada aktivitas siswa, perbedaannya adalah pada tingkat kesulitan tugas yang diberikan. *Sharing tasks* merupakan tugas yang diharapkan dapat dikuasai oleh seluruh siswa, sesuai dengan tuntutan kurikulum, sedangkan *jumping tasks* adalah tugas dengan level yang lebih tinggi (*advanced*), yang diharapkan dapat memacu siswa untuk

belajar dan berpikir lebih mendalam, sehingga tuntutan tingkat pembelajaran pada kelas tersebut menjadi lebih berkualitas.

Hasil penelitian memperlihatkan bahwa untuk tugas *sharing tasks* rata-rata telah dilakukan baik sebelum maupun sesudah LSLC. Pemberian tugas *jumping*, yang antara lain dilakukan dengan memanfaatkan pengetahuan yang sudah ada pada siswa, untuk memformulasi pengetahuan baru, atau pemecahan masalah, maupun kegiatan berpikir kritis, masih perlu ditingkatkan implementasinya. Pada bagian ini, guru-guru biologi masih perlu didampingi, dalam hal memberikan tugas yang dapat memacu siswa untuk berpikir lebih mendalam, lebih kritis, lebih inovatif dan kreatif.

Presseisen (dalam Costa,1985) mengelompokkan keterampilan berpikir menjadi keterampilan berpikir dasar dan keterampilan berpikir kompleks. Keterampilan berpikir dasar meliputi 10 aspek, yaitu menghafal, membayangkan, mengelompokkan, menggeneralisasikan, membandingkan, mengevaluasi, menganalisis, mensintesis, mendeduksi, dan yang terakhir adalah menyimpulkan. Dalam hal ini kemampuan berpikir dasar adalah menemukan hubungan, menghubungkan sebab akibat, mentransformasikan, mengklasifikasikan dan memberi kualifikasi. Keterampilan berpikir kompleks dapat dikategorikan kedalam empat kelompok, yaitu pemecahan masalah, pengambilan keputusan, berpikir kritis dan berpikir kreatif (Costa,1985 dalam Hendrawati 2009).

4. KESIMPULAN

- 1) Implementasi LSLC dapat meningkatkan kolaborasi dalam bentuk kegiatan saling mendengar, saling bekerjasama, saling membantu, dan saling memberi masukan pada siswa kelas XI IPA SMAN-1 Palangka Raya.
- 2) Implementasi LSLC dapat meningkatkan kualitas belajar biologi, dalam bentuk peningkatan aktivitas *hands on, minds on*, dan capaian belajar siswa kelas XI IPA SMAN-1 Palangka Raya.

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**PRAKTIK PENGALAMAN LAPANGAN PESERTA PPG DI
UNIVERSITAS PENDIDIKAN GANESHA BERBASIS LESSON STUDY**
**Field Experience Practice Participants Of Teacher Professional Education In Ganesha University
Of Education Based On Lesson Study**

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Abstrak Lokakarya *Lesson Study* bagi para peserta PPG menjadi bagian penting dalam persiapan pelaksanaan PPL PPG SM-3T. Instruktur atau narasumber dalam kegiatan workshop ini adalah instruktur nasional *Lesson Study*. Materi yang diberikan adalah teori secara singkat dan praktik pelaksanaan *Lesson Study* dalam bentuk simulasi dan *peer teaching*. Pada saat peserta PPG SM-3T melaksanakan tugas di sekolah-sekolah mitra Undiksha, mereka diwajibkan untuk menerapkan pola *Lesson Study* dalam pembelajaran. Peserta PPL diwajibkan menjadi guru model minimal dua kali. Tim *Lesson Study* terdiri atas para peserta PPL PPG SM-3T dalam program studi yang sama, para guru pamong, para dosen pembimbing, dan kepala sekolah. Setiap pelaksanaan *Lesson Study* dibuat laporan kegiatan secara tertulis.

Kata kunci: ppl, ppg, lesson study.

Abstract Lesson study workshop for the participants of teacher professional education was an important part in preparation teacher professional education. The workshop instructor was lesson study national instructor. The content of workshop were short theory and lesson study practical that use simulation and peer teaching methods. While teacher professional education participants done their task in the school, they must be model teacher twice time minimum. The lesson study team are teacher professional education participants in the same department, teachers, lectures, and headmaster. Teacher professional education participants must make an activities report.

Key words: field experience practice, teacher professional education, lesson study.

1. Pendahuluan

Dalam rangka percepatan pembangunan pendidikan di daerah 3T, Kementerian Pendidikan dan Kebudayaan mengembangkan Program Maju Bersama Mencerdaskan Indonesia, yang salah satunya adalah Program Pendidikan Profesi Guru Sarjana Mendidik di Daerah 3T (PPG SM-3T). Program ini merupakan sebagian jawaban untuk mengatasi berbagai permasalahan pendidikan di Daerah 3T.

Program PPG SM-3T didahului dengan Program SM-3T yaitu pengiriman sarjana kependidikan ke beberapa Daerah 3T di seluruh Indonesia. Program SM-3T ini diperuntukkan bagi para sarjana kependidikan yang belum bertugas sebagai guru PNS/Guru Tetap Yayasan, untuk ditugaskan selama satu tahun di daerah 3T. Program SM-3T dimaksudkan untuk membantu mengatasi kekurangan guru, sekaligus mempersiapkan calon guru profesional yang tangguh, mandiri, dan memiliki sikap peduli terhadap sesama, serta memiliki jiwa untuk mencerdaskan anak bangsa, agar dapat maju bersama mencapai cita-cita luhur seperti yang diamanatkan oleh para pendiri bangsa Indonesia. Setelah menyelesaikan masa penugasan selama 1 (satu) tahun di daerah 3T peserta mendapat kesempatan mengikuti program Pendidikan Profesi Guru Prajabatan selama 1 (satu) tahun. Jadi, Program PPG SM-3T adalah Program Pendidikan Profesi Guru bagi sarjana pendidikan yang telah melaksanakan tugas pengabdian di daerah 3T selama satu tahun.

Pelaksanaan Program PPG SM-3T bisa dikategorikan ke dalam PPG Prajabatan, dengan dasar hukum yang jelas, yaitu:

- 1) Undang-Undang Nomor 20 Tahun 2003 tentang Sistem Pendidikan Nasional.
- 2) Undang-Undang Nomor 14 Tahun 2005 tentang Guru dan Dosen.
- 3) Peraturan Pemerintah Nomor 19 Tahun 2005 tentang Standar Nasional Pendidikan.
- 4) Peraturan Pemerintah Nomor 74 Tahun 2008 tentang Guru.
- 5) Permendiknas Nomor 16 Tahun 2007 tentang Standar Kualifikasi Akademik dan Kompetensi Guru.

- 6) Permendiknas Nomor 27 Tahun 2008 tentang Standar Kualifikasi Akademik dan Kompetensi Konselor.
- 7) Permendikbud Nomor 87 Tahun 2013 tentang Program Pendidikan Profesi Guru Prajabatan.

Berbagai upaya telah dilakukan untuk meningkatkan kualitas proses dan hasil pelaksanaan PPG SM-3T oleh Lembaga Pendidikan dan Tenaga Kependidikan (LPTK). Universitas Pendidikan Ganesha (Undiksha) sebagai salah satu LPTK penyelenggara PPG SM-3T sejak tahun 2013 telah menerapkan *Lesson Study* (LS) dalam pelaksanaan PPL PPG SM-3T. Dalam tulisan ini akan dipaparkan secara singkat pelaksanaan PPG SM-3T berbasis LS.

2. Lesson Study di Universitas Pendidikan Ganesha

Akhir-akhir ini istilah *Lesson Study* sering didiskusikan, diseminarkan dan dilatihkan sebagai suatu kegiatan pengembangan kemampuan dan keprofesionalan dosen. *Lesson Study* (LS), *Jugyonkenkyu* (istilah dalam bahasa Jepang) atau "Kaji Pembelajaran" adalah suatu pendekatan peningkatan kualitas pembelajaran yang kini diupayakan untuk disebarluaskan ke sebagian besar LPTK (Lembaga Pendidikan Tenaga Kependidikan) di Indonesia. Hal ini dilakukan karena diyakini LS dapat meningkatkan kemampuan dan keprofesionalan dosen, sehingga dapat meningkatkan kualitas perkuliahan yang diampunya. Direktorat Jenderal Pendidikan Tinggi Departemen Pendidikan Nasional menaruh perhatian yang besar terhadap LS.

Sejak tahun 2008, Direktorat Ketenagaan (Ditnaga), salah satu direktorat dalam Direktorat Jenderal Pendidikan Tinggi, telah memilih LS sebagai salah satu program unggulan yang akan dilaksanakan dalam 5 tahun ke depan, bersama program-program unggulan lainnya. Pada tahun 2008 Direktorat Ketenagaan telah membentuk *Task Force* Perluasan dan Penguatan LS yang terdiri dari 6 orang dosen yang mewakili 3 LPTK. Selain itu *Task Force* juga telah menyusun 5 buah buku yang menjadi landasan pelaksanaan perluasan LS untuk penguatan LPTK.

Buku kedua tentang Panduan Penyusunan Proposal Program Perluasan LS di LPTK telah disebarluaskan melalui situs Ditnaga untuk mengundang LPTK yang berminat mengajukan proposalnya. Pada saat itu disepakati bahwa pemberian hibah akan dilakukan untuk 3 *Batch*, dengan masing-masing *Batch* selama 3 tahun. Tahun pertama kegiatan di fakultas/jurusan/program studi MIPA (Matematika dan Ilmu Pengetahuan Alam), tahun kedua kegiatan di fakultas/jurusan/program studi non-MIPA, dan tahun ketiga kegiatan diseminasi ke LPTK lain atau MGMP (Musyawarah Guru Mata Pelajaran).

Dari seluruh pengusul yang berjumlah 21 LPTK telah diseleksi 10 LPTK yang tersebar di tiga wilayah untuk ditugaskan melakukan perluasan LS selama 3 tahun. Implementasi LS di 10 LPTK akan didampingi dan dimonitor oleh Tim LS yang berasal dari tiga universitas. Wilayah Barat diwakili oleh Universitas Negeri Jakarta (UNJ), Universitas Sriwijaya (Unsri), dan Universitas Negeri Padang (UNP) didampingi dosen-dosen Universitas Pendidikan Indonesia (UPI). Wilayah Tengah diwakili oleh Universitas Negeri Tanjungpura (Untan), Universitas Negeri Semarang (UNNES), dan Universitas Negeri Lambungmangkurat (Unlam) didampingi oleh dosen-dosen Universitas Negeri Yogyakarta (UNY). Wilayah Timur diwakili oleh Universitas Negeri Surabaya (Unesa), **Universitas Pendidikan Ganesha (Undiksha)**, Universitas Nusa Cendana (Undana), dan Universitas Negeri Manado (Unima) didampingi oleh dosen-dosen Universitas Negeri Malang (UM).

Pelaksanaan LS di Fakultas MIPA Undiksha telah berakhir dan telah melaksanakan kegiatan diseminasi. Selanjutnya, pelaksanaan LS dilakukan di fakultas non-MIPA. Fakultas non-MIPA Undiksha yang pertama melaksanakan LS adalah Fakultas Ilmu Pendidikan (FIP). Pelaksanaan LS di FIP Undiksha dimulai pada bulan Nopember 2009 dan berakhir Pebruari 2010. Masing-masing jurusan di FIP diberi kepercayaan untuk melaksanakan LS. Jurusan Teknologi Pendidikan, sebagai salah satu jurusan di FIP Undiksha telah melaksanakan LS sesuai rencana yang telah ditentukan. Secara umum pelaksanaan LS di Undiksha berjalan sangat baik dan banyak memberi manfaat, baik untuk Undiksha maupun untuk sekolah-sekolah mitra Undiksha. Bertolak dari keberhasilan pelaksanaan LS pada beberapa jurusan di Undiksha, maka pelaksanaan PPL PPG SM-3T mencoba mengadopsi pola LS.

3. PPG SM-3T

Tujuan Program PPG SM-3T ini adalah menindaklanjuti penyiapan calon pendidik yang memiliki jiwa keterpanggilan untuk mengabdikan dirinya sebagai pendidik profesional bagi pelaksanaan pendidikan di Indonesia, khususnya di Daerah 3T. Tujuan khususnya adalah seperti yang tercantum dalam Permendiknas No 8 Tahun 2009 Pasal 2, yaitu untuk menghasilkan calon guru yang memiliki kompetensi dalam merencanakan, melaksanakan, dan menilai pembelajaran, menindaklanjuti hasil penilaian, melakukan pembimbingan, dan pelatihan peserta didik serta melakukan penelitian, dan mampu mengembangkan profesionalitas secara berkelanjutan.

Ruang lingkup pelaksanaan PPG SM-3T adalah (1) mengikuti seluruh kegiatan akademik di kelas berupa kegiatan Workshop SSP untuk pengembangan perangkat pembelajaran sesuai bidang studi PPG yang diikutinya, (2) menyelenggarakan kegiatan ilmiah berupa praktek kependidikan di kampus melalui *peer teaching* atau *microteaching* dan praktek kependidikan di sekolah-sekolah mitra melalui PPL, dan (3) mengikuti seluruh kegiatan kehidupan asrama, dengan tingkat kehadiran/partisipasi penuh.

Rekrutmen peserta PPG SM-3T melalui suatu mekanisme yang sepenuhnya ditangani oleh Direktorat Pendidik dan Tenaga Kependidikan (Dit Dikendik), Dikti, selanjutnya ditangani oleh Direktorat Pembelajaran Direktorat Jenderal Pembelajaran dan Kemahasiswaan, Kementerian Riset, Teknologi, dan Pendidikan Tinggi. Peserta yang direkrut memiliki persyaratan sebagai berikut: (1) Sarjana Pendidikan yang telah selesai melaksanakan tugas pengabdian melalui Program SM-3T, (2) memiliki latar belakang bidang studi yang sesuai dengan program studi PPG, (3) berbadan sehat yang dibuktikan dengan surat keterangan Dokter., (4) bebas narkoba, psikotropika, dan zat adiktif (napza) yang dibuktikan dengan Surat Keterangan Bebas Narkoba (SKBN) dari pejabat yang berwenang, yang disertai dengan hasil tes urine, (5) berkelakuan baik yang dibuktikan dengan surat keterangan dari kepolisian, (6) mendapatkan ijin dari orangtua/wali, yang dibuktikan dengan surat pernyataan bermaterai, dan (7) sanggup mengikuti seluruh kegiatan di kelas maupun di asrama, dengan tingkat kehadiran/partisipasi penuh.

Peserta Program PPG SM-3T dari Undiksha memiliki kewajiban: (1) menandatangani kontrak kesanggupan melaksanakan Program PPG SM-3T sesuai aturan yang berlaku; (2) mengikuti seluruh prosesi workshop pengembangan perangkat pembelajaran sesuai dengan bidang studinya masing-masing sesuai jadwal yang telah ditentukan; (3) melaksanakan praktek pengalaman lapangan kependidikan (PPLK) di sekolah-sekolah mitra yang sudah ditentukan, dengan penuh waktu, penuh rasa tanggung jawab dan dedikasi yang tinggi; (4) melaksanakan tugas-tugas dan mengikuti seluruh kegiatan asrama dengan penuh waktu, penuh tanggungjawab, dan dedikasi yang tinggi; dan (5) membina kerjasama yang baik dengan sesama peserta, masyarakat, dan instansi terkait.

Hak para peserta selama mengikuti Program PPG SM-3T adalah: (1) atribut/seragam PPG SM-3T berupa baju kaos dan training; (2) uang saku setiap bulan sebesar Rp. 500.000,00 (lima ratus ribu rupiah); (3) bantuan biaya buku setiap bulan sebesar Rp. 250.000,00; (4) biaya-biaya transport yang terkait dengan kegiatan pembelajaran dan asrama; (5) biaya kesehatan; (6) konsumsi harian berupa makan 3 kali sehari dan snack satu kali sehari; (6) pelayanan administrasi terkait pembelajaran; dan (7) pelayanan tempat tinggal di asrama.

Apabila ada hal-hal yang merusak nama baik lembaga Undiksha dan Dikti pada umumnya, serta melanggar ketentuan dalam buku pedoman dan tidak memenuhi kewajiban, para peserta akan diberikan sanksi dengan tingkatan sebagai berikut: (1) peringatan secara lisan, (2) peringatan secara tertulis, (3) pemulangan sebelum waktunya berakhir, selanjutnya yang bersangkutan dinyatakan gugur/tidak lulus, (4) peserta yang telah dinyatakan gugur tidak berhak untuk mendapatkan Sertifikat Pendidik.

4. PPL PPG SM-3T

Sesuai dengan Buku Pedoman Pelaksanaan PPG SM-3T, maka beban Sistem Kredit Semester (SKS) adalah 36-40 SKS. Pelaksanaan PPG SM-3T di Undiksha menggunakan 36 SKS yang dibagi menjadi dua jenis kegiatan pokok, yaitu Workshop Pengembangan dan Pengemasan Perangkat Pembelajaran 20 SKS dan Praktik Pengalaman Lapangan Kependidikan 16 SKS.

Pelaksanaan PPL PPG SM-3T di Undiksha didahului dengan kegiatan orientasi awal PPL. Dalam kegiatan orientasi awal PPL PPG SM-3T para peserta diberikan berbagai kegiatan untuk memberikan bekal pengetahuan dan keterampilan kepada para peserta tentang berbagai hal yang berkenaan dengan pelaksanaan PPL. Materi yang diberikan antara lain etika, administrasi PPL, prosedur PPL, sistem pembimbingan, monitoring dan evaluasi, sistem penilaian, waktu pelaksanaan, kegiatan mengajar dan nonmengajar, *workshop lesson study*, hak dan kewajiban peserta, dan sistem penilaian.

Hal penting yang menjadi perhatian dalam pelaksanaan PPL PPG SM-3T Undiksha adalah penerapan *Lesson Study*. Untuk itu *workshop Lesson Study* bagi para peserta PPG yang dilaksanakan selama dua hari menjadi bagian penting dalam persiapan pelaksanaan PPL PPG SM-3T. Instruktur atau narasumber dalam kegiatan workshop ini adalah instruktur nasional *Lesson Study*. Materi yang diberikan adalah teori secara singkat dan praktik pelaksanaan *Lesson Study* dalam bentuk simulasi dan *peer teaching*.

Langkah pelaksanaan LS yang mencakup perencanaan (*plan*), pelaksanaan (*do*), serta pengamatan (*see*) yang dilanjutkan dengan refleksi dilatihkan kepada para peserta PPG SM-3T secara berkelompok. Pada kegiatan *workshop* ini juga disimulasikan kegiatan *open class*, sehingga para peserta memperoleh keterampilan mengelola dan mengikuti kegiatan *open class*.

Pada saat peserta PPG SM-3T melaksanakan tugas di sekolah-sekolah mitra Undiksha, mereka diwajibkan untuk menerapkan pola *Lesson Study* dalam pembelajaran. Peserta PPL diwajibkan menjadi guru model minimal dua kali. Tim *Lesson Study* terdiri atas para peserta PPL PPG SM-3T dalam program studi yang sama, para guru pamong, para dosen pembimbing, dan kepala sekolah. Setiap pelaksanaan *Lesson Study* dibuat laporan kegiatan secara tertulis.

5. Penutup

Salah satu kegiatan kurikuler dalam pelaksanaan PPG SM-3T adalah PPL. PPL yang berbobot 16 SKS dilaksanakan di sekolah mitra Undiksha selama empat bulan. Untuk meningkatkan profesionalitas sebagai calon seorang guru, maka peserta PPL dalam pelaksanaan PPL diwajibkan untuk menggunakan pola *Lesson Study*. Hal ini penting mengingat *Lesson Study* merupakan salah satu wujud nyata penerapan dan pemberdayaan komunitas belajar (*learning community*) dalam dunia pendidikan.

6. Daftar Pustaka

- Buku Panduan Peserta Program Sarjana Mendidik di Daerah 3T (SM-3T) Tahun 2015. Kementerian Riset, Teknologi, dan Pendidikan Tinggi, Direktorat Jenderal Pendidikan Tinggi.
- Buku Panduan Pendidikan Profesi Guru Pasca SM-3T Tahun 2015. Kementerian Riset, Teknologi, dan Pendidikan Tinggi, Direktorat Jenderal Pendidikan Tinggi.

**"SILYCOUN DENSUS" (SILAT BY THE SIMULATION AND COUNSELING SOCIODRAMA)
AS AN ALTERNATIVE PREVENT YOUNG FIGHTERS BRAWL AMONG SMAN 1 Jiwan**

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Abstract: The purpose of the activities of student creativity program community service is to prevent aggressive actions of students who take martial arts martial arts, especially in terms of young fighters brawl at SMA Negeri 1 Jiwan Madiun.

To achieve the goal, namely to prevent fights among fighters Young SMA Negeri 1 Jiwan, the program prepared by the method of Counseling very interesting to say to students who use the model role play, ie with SILYCOUN Detachment (Silat by Counseling Simulation and Sociodramas) that combined with other activities such as guidance counseling group. Obviously this will make students become more interested and excited for the event. So expect after joining this program, young fighter SMA Negeri 1 Jiwan can have self-control and empathy to refrain from actions that are aggressive like brawling. Counseling for young fighters is very important, because the adolescent emotions are very unstable and easily influenced.

The results of the implementation of the program is provided through intensive exercise, seemed enthusiastic students to accept differences in education, empathy students in performing the role sociodramas able to enter in their daily lives, as well as some students who initially resolve problems using emotions, so far already shows improvement which has begun to think about the risk or bad consequences if forward emotions, although there are still some students who need special attention in performing the role because the level of high emotion.

Key Words: Silat, Counselling, Simulation, Sociodrama.

Abstrak: Tujuan dari kegiatan program kreativitas mahasiswa pengabdian pada masyarakat ini adalah untuk mencegah tindakan agresif siswa yang mengikuti seni beladiri pencak silat khususnya dalam hal tawuran pada pesilat muda SMA Negeri 1 Jiwan Kabupaten Madiun.

Untuk dapat mencapai tujuan, yaitu mencegah tawuran dikalangan pesilat muda SMA Negeri 1 Jiwan, program ini disusun dengan metode Bimbingan Konseling yang sangat menarik untuk disampaikan kepada siswa yang menggunakan model permainan peran, yaitu dengan *SILYCOUN DENSUS* (Silat by Counseling dengan Simulasi dan Sociodrama) yang dipadukan dengan kegiatan konseling lainnya seperti bimbingan kelompok. Tentunya hal ini akan membuat siswa tertarik dan menjadi lebih bersemangat untuk mengikuti kegiatan. Sehingga diharapkan setelah mengikuti program ini, pesilat muda SMA Negeri 1 Jiwan bisa mempunyai pengendalian diri dan rasa empati agar tidak melakukan tindakan yang bersifat agresif seperti tawuran. Konseling untuk pesilat muda ini sangat penting, sebab emosi remaja sangatlah labil dan mudah dipengaruhi.

Hasil dari pelaksanaan program ini yang diberikan melalui latihan intensif, terlihat antusias siswa untuk mau menerima perbedaan perguruan, empati siswa dalam melakukan peran sociodrama mampu masuk dalam kehidupan sehari-harinya, serta beberapa siswa yang pada mulanya menyelesaikan masalah menggunakan emosi, sejauh ini sudah menunjukkan peningkatan yaitu sudah mulai mampu memikirkan resiko atau akibat buruk jika mengedepankan emosi, meskipun masih ada beberapa siswa yang membutuhkan perhatian khusus dalam melakukan peran karena tingkat emosi yang tinggi.

Kata kunci: Silat, *Counselling*, Simulasi, Sociodrama

1. PRELIMINARY

Based on observations obtained, SMA Negeri 1 Jiwan a suitable school to become a target PKM-M with the title "SILYCOUN Detachment" (Silat By Counseling With Simulation and Sociodramas) As an alternative Abatement brawl among young Pesilat SMA Negeri 1 Jiwan.

The school is housed in the west with the district. Maospati, Magetan, in the north bordering the district. West District. Ngawi, East with the Madiun approximately 4 km from the City of Madison. Environment in the village of majority is a warrior with a variety of college silat. Nearly 70% of students SMA Negeri 1 Jiwan is a fighter, but in terms of self-control ability of the fighters is very less. The majority of fighters SMA Negeri 1 Jiwan participate annually brawl that, in a time of 1 Suro. Their inability due to many outside influences and they have not been able to filter incoming influence. In this case can be influenced by several factors, for example, there is a personal problem but most of them went along, arguing that the hostilities had been hereditary inherited from their ancestors who had clashed with other college silat. Another reason is loyalty, because they were defending a friend who was a power struggle with college silat door when they do not know the real issues. Therefore, self-control and less parental attention to children be one of the low empathy students.

Pencak Silat is a skill or ability to defend itself with cleverness parry, attack and defense with or without arms. Having the ability to martial arts is one of the advantages of self-defense, but the thought of young students who are still unstable and are not able to control your emotions and had pocketed a good martial arts, the students sometimes misuse it, not to defend themselves but to support negative emotions. Therefore, it is necessary to direct assistance to potential this fighter is able to create performance, not vice versa. Especially when faced with exponents differences should not be debated but even the big problem, for example, is the difference in college. According to Hughes (2007), pencak silat is a martial art rooted in traditional Malay culture, and can be found in almost all parts of Indonesia. Currently, the martial arts has been contested in the national and international levels.

Actually, the fighters have received the material on how the application of martial arts in perguruanannya, and after studying martial arts at the course the student should have been able to use and take advantage of the martial arts as needed. But in fact, the young fighter SMA Negeri 1 Jiwan majority have not been able to direct their resources into the well. The inability of students caused by the level of emotional lability and low self-control. This causes them unable to accept well the lessons of what has been delivered by their coach while in forging practice site. Even when there was a small misunderstanding that occurred, both from fellow fighters but in a different college or students who do not follow the martial arts, it will make them as big enemy. This leads to difficult for teachers to intervene thoroughly because if fights dilelai school can not guarantee the problem is completed, because they feel they have a lot of friends fighters who will support them, they will continue the fight outside the school.

The program aims to prevent a fight or brawl at a young fighter SMA Negeri 1 Jiwan using SILYCOUN Detachment (Silat By Counseling With Simulation and Sociodramas). The advantages of this Densus Silycoun is growing awareness in the management of emotions by utilizing guidance and counseling services with methods play a role so that the fighters are invited to be able to empathize with others and through his role. With the growing awareness of the importance of self-control and have a sense of empathy for others it fights or brawls can be avoided.

The outcomes expected from community service activities are the students able to control himself not to do brawl or a fight with a program of activities SILYCOUN Detachment and the guidebook "SILYCOUN Detachment" made in full, from start to understanding martial arts, understanding the martial arts, the notion counseling, the notion of group counseling and how to implement it, understanding sociodrama and how to implement it, the notion of simulation and how to implement it, including how to implement SILYCOUN Detachment and sociodramas example. The book is made complete in order, the service provider will be able to continue these activities even though the program is not accompany the team again. The handbook was given to the school as a guide or teacher grip in sustainability programs.

2. PROGRAM EXECUTION METHOD

Community service activities conducted in SMAN 1 Jiwan. In practice, the goal in this activity is a young fighter SMA Negeri 1 Jiwan Madiun. Design community service activities is using the game,

through the following steps: 1) consulting to the supervisor, 2) the initial observation to school, 3) design programs, 4) implementation, and 5) evaluation.

3. RESULTS AND DISCUSSION

From the observations in the field as well as information obtained through school principals, school counselors and classroom teachers can be concluded that there are 75% of the fighters managed to reduce the level of aggressiveness to be able to have a good social attitudes. And this shows the success of the program SILYCOUN Detachment for young fighters SMA Negeri 1 Jiwan.

From the implementation of programs that have been implemented, has seen the progress of students pesilat of which can be seen from the level of a low emotional, empathetic students in the mix and self-control, as well as some students at first like reflexes to hit, so far has shown a decline, though still there are some students fighter who require special attention in the guidance. So expect when the guidance program is completed, students are able to control themselves well and have not called to do a fight or brawl.

Tawuran a juvenile delinquency that must be addressed immediately. If brawl left alone and only rely on the laws it will not appear awareness empathy in those who are the foundation for students to be able to accept and understand others, this program seeks to help improve the character of the nation through addressing juvenile delinquency and turn it into empathy high realized through counseling methods play a role, it is expected that students can direct their potential for achievement.

Handling for the fighter who still has a high level of aggressiveness will be given in the form of services through group counseling and individual counseling on an ongoing basis to determine the root of the problems experienced by the individual in order to improve his attitude and to develop the potential that exists in him as true and purposeful.

With intensive training and the provision of counseling services it is expected that individuals who have difficulty fighter will soon be able to adjust. So that all young fighter SMA Negeri 1 Jiwan able to control themselves and developing empathy with methods play a role in order to avoid a fight or brawl that absolutely can not be seen kebermanfaatannya.

The next thing you can do to achieve maximum results, namely to prevent a brawl at SMA Negeri 1 Jiwan is the role of mentoring through existing BK teacher disekolahan. This program is a new innovation for teacher guidance and counseling, because this program helps eliminate misunderstandings BK students against teachers who have long been regarded as the school police. This program can be used as a convenient means of creating a sense of students to teachers BK.

4. CONCLUSION

The benefits derived from this activity is a fighter student will receive guidance through "SILYCOUN Detachment" (Silat By Counseling With Simulation And Sociodramas) As an alternative Prevention Amongst Tawuran Pesilat Young SMAN 1 Jiwan. With decreasing and increasing emotional attitude of empathy generated in methods play a role, then the young fighters will be easier to control myself so as not provoked a fight or brawl. So expect students can improve academic achievement and non-academic at the next grade level.

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**IMPROVING STUDENT LEARNING OUTCOMES
IN LEARNING AND SORT FRACTIONS FRACTIONS OF
THE GAME CARD THROUGH**

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Abstract: This study aims to investigate how the learning process by using the card games can improve student learning outcomes in learning fractions in particular determine equivalent fractions and fractions sort. The approach used in this research is descriptive kualitatif. Research is classroom action research conducted in odd semester of 2011/2012 in SMPN Rejoso in mathematics equivalent fractions and sort material fractions. Data were collected through worksheets, observation and interviews. Data analysis was descriptive of the learning process and results. The results showed that the application of learning with fractional card games can improve student learning outcomes in the material equivalent fractions and fractions sort. Selection methods and learning models, with regard to the character of students, provide improved cognitive and affective aspects, in particular to sort material fractions and equivalent fractions in class VII SMPN 2 Rejoso. Through innovation and creativity of teachers are expected to find new strategies or digging new knowledge for the betterment of the students.

Keywords: card games, equivalent fractions, fractions sort, learning outcomes

Abstrak Penelitian ini bertujuan untuk menginvestigasi bagaimana proses pembelajaran dengan menggunakan permainan kartu dapat meningkatkan hasil belajar siswa dalam pembelajaran pecahan khususnya menentukan pecahan senilai dan mengurutkan pecahan. Pendekatan yang digunakan dalam penelitian ini adalah deskriptif kualitatif. Penelitian yang digunakan adalah penelitian tindakan kelas yang dilaksanakan pada semester gasal 2011/2012 di SMP Negeri Rejoso, Pasuruan pada mata pelajaran matematika materi pecahan senilai dan mengurutkan pecahan. Pengambilan data dilakukan melalui lembar kerja, observasi dan wawancara. Analisis data dengan cara deskriptif dari proses dan hasil belajar. Hasil penelitian menunjukkan bahwa penerapan pembelajaran dengan permainan kartu pecahan mampu meningkatkan hasil belajar siswa pada materi pecahan senilai dan mengurutkan pecahan. Pemilihan metode dan model pembelajaran, dengan memperhatikan karakter siswa, memberikan peningkatan aspek kognitif dan afektif, khususnya untuk materi mengurutkan pecahan dan pecahan senilai di kelas VII SMPN 2 Rejoso. Melalui inovasi dan kreativitasnya guru diharapkan menemukan berbagai strategi baru atau menggali pengetahuan baru demi kemajuan anak didiknya.

Kata kunci: *permainan kartu, pecahan senilai, mengurutkan pecahan, hasil belajar.*

1 INTRODUCTION

There are three points of view that can be used to determine the quality of a school that is input, process and output (Arikunto 2006; Enjah 2008; Chotimah, 2009). Given three interrelated angles in mathematics must consider carefully in order to obtain optimal results. Some things will be related to the three angles will be described as follows.

Input SMPN 2 Rejoso coming from SD / MI in the vicinity. Students entering without a test and only 10% have UNAS mathematics in particular above 6.00. But still expected once cultivated the students can achieve optimal learning results. Based on these facts, then to overcome it needed an effort to improve the learning of mathematics. One effort to fix this is to use appropriate learning media. This is consistent with the purpose of learning mathematics in junior high school is through practical activities

(memanifulasi media or concrete objects) expected students to understand mathematical concepts (BSNP, 2006). The role of the media / learning tool slightest form requires the creativity of teachers in selecting the type and characteristics according to the conditions of the students and the material presented (Firmanawaty, 2003; Jihad, 2008)

Researchers initiative to make a card game by utilizing the knowledge of students in playing cards in their games everyday. The use of media or props of sophistication not seen but the most important have been selected for in accordance with the conditions in the field and its role in helping to improve the quality of teaching and learning process (Firmanawaty, 2003; Muhsetyo 2008; Nurhadi, 2004).

A learning process, there are two very important elements is the method of teaching and learning media. Selection of specific teaching methods will affect the type of learning appropriate media (Mustikasari 2008; Sudrajat, 2011; Sukestriyono, 2007). So that the learning process can be managed properly, learners can take advantage of all the tools of his senses. Educator seeks to generate stimulus / stimulus that can be processed appliance senses. The more tools senses that can be used to receive and process information the more likely the information is understood and maintained in memory (long term memory) so it can easily receive and absorb the messages given (Muhsetyo 2008, Firmanawaty, 2003; Kagan, 2001).

Games that use the card, for example to introduce the concept and understanding of students of class VII in particular to the material fractions. The concept can be understood that recognize the various fractions (common fraction and decimal fractions), equivalent fractions, add fractions and fractions sort. Plaything in question are the cards that contain fractional numbers. Then played like playing cards. To facilitate the understanding of students prepared a list of fractional numbers.

After explaining the subject matter educators, learners are directed to execute the game. Then learners execute the game according to the rules of the game. Last game there is a punishment / reward in accordance with the collective agreement.

Furthermore, educators can provide practice questions or independent assignments and tests to determine the assessment of learning outcomes learners absorption of the material that was submitted.

Based on the above, the researchers are interested to give the title of the paper is "Improving Student Learning Outcomes in Learning Determining Denomination Worth And Ordering Fractions Through Card Games".

2. RESEARCH METHODOLOGY

This study used a qualitative descriptive approach while the type of research including Action Research (PTK).

This classroom action research conducted in class VII B SMP 2 Rejoso. Researchers act as teachers and peers in the group MGMPs Mathematics Lesson Study, as an observer. During the study ranging from planning, implementation, evaluation, the authors collaborated with observer to look and sharpen the problems that the results of students' ability to understand the concept of equivalent fractions achieve a minimum average value or KKM 65.

The subject of research in the download is a class VII B. The timing of the first semester of the 2011/2012 academic year. Class VII B of 43 students, 23 male and 20 female students.

This classroom action research conducted in the form of process cycle (cycle), each cycle consisting of the stages of planning (Planning), action (action) and reflection (reflektion) (Kasbolah, 1999).

The measures that have been implemented are described as follows: 1) the stage of planning (planning), which aims to design a student-centered learning. Planning begins with an analysis of the problems in learning, then pass on the lesson plan. Several other teachers provide input for an idea. Then learning plans result of discussions in the revised plan; 2) phase do (the implementation of) learning to apply the lesson plan which has been formulated in the lesson plan by the teacher models. Before the implementation of the briefing is done in advance to inform the plan reaffirmed the results before the open class. Implementation of the open class aims to pilot the effectiveness of learning scenarios that

have been designed. Other teachers to act as an observer / observer. Observer observed in aspects of student interaction, student interaction with teachers, students' interaction with the media or learning resources, student interaction with other environments, times when students are not active or stop studying, and observerpun can write valuable experience in the observation sheet. The material on the implementation of the open class fractions that have been conducted in which the order of fractions and determine equivalent fractions. Sequentially implementation of the open class using a model of the game, namely playing cards; 3) stages see (reflection) immediately after the open class is completed. This activity begins delivery of the impressions of teachers towards learning models that have been implemented. Furthermore, observers are asked to submit the findings of his observations and provide feedback that can be used as a reference in future learning improvement. The learning improvements can be prepared in the future learning.

The analysis used in this study is utilizing a descriptive analysis of the process and learning outcomes. Analyses were also conducted on observations and interviews. The analysis is based on a cycle that gradually. Analysis 1 in cycle 1 that the results are reflected to the second cycle as well to cycle 3, while reflections made in accordance with the planning done.

Quantitative data is data obtained from the value of the written tests and worksheets group. To determine the value of each student mastery of any indicator then the data is compared with the value of 68% completeness School. The qualitative data obtained from observation sheet of students during the learning taking place, that of the affective aspect. These data were analyzed with descriptive analysis.

Assessment is done to determine whether learners have successfully mastered a kompetensi refers to indicators that have been set. At least 70% of indicators that are considered very important and represent each basic competence to be assessed. To gather information on whether an indicator has been featured on the self-learners, assessment of learning took place during and after the study. Criteria mastery learning every indicator has been set in a basic competence ranges from 0% -100%. When referring to Schools National Standard Criteria for Mastery Learning 75%. Referring to KKM school is 68%. Mechanical assessment carried out in 3 stages: Rating is based on the first cycle, the second cycle based assessment, assessment by the third cycle.

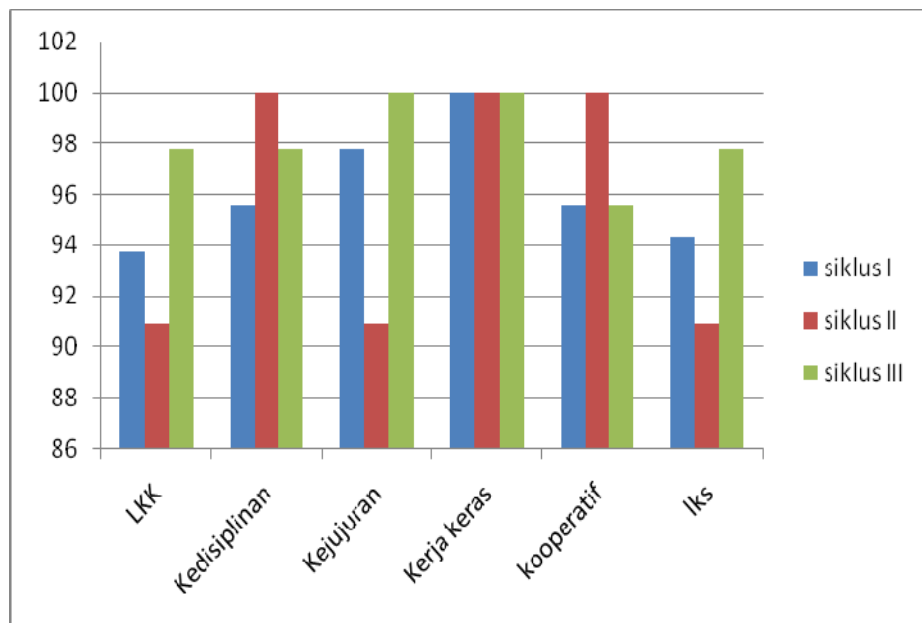
3. RESULTS AND DISCUSSION

The results of the observation sheet prepared in the narrative becomes a collection of information that is obtained from the reduction so as to give the possibility of drawing conclusions and taking action. The information referred to is the description of the process of learning activities that have been recorded in the observation sheet. The preparation of such information combines data from the contents of field notes on the observation sheet. Results affective group learning through observation and test groups obtained for the first cycle, as follows: 1) students are quite active in the learning process because it encouraged a great curiosity to learning materials; 2) the results of the written test scores obtained workmanship 93.75 Group Worksheet %; 3) level of discipline 95.55%, 97.77% honesty, hard work and cooperation of the group 100% (cooperative) 95.55%; 4) the results of the written test score obtained workmanship individual student worksheets obtained 94.32% with 5 students have not reached the SKM.

Results affective group learning through observation and test groups obtained for Cycle II, as follows: 1) students are quite active in the learning process because it encouraged a great curiosity to learning materials; 2) written test results obtained Scores Worksheet workmanship Group 90.91%; 3) observation activities can enhance the activity of students based on teacher observation that is a 100% level of discipline, honesty 90.90%, 100% hard work and co-operation group (cooperative) 100%; 4) the results of the written test score obtained workmanship individual student worksheets obtained 90.91% with 8 student has not reached the SKM.

Results affective group learning through observation and test groups obtained for Cycle III, as follows: 1) students are quite active in the learning process because it encouraged a great curiosity to learning materials; 2) written test results obtained Scores Worksheet workmanship Group 97.73%; 3)

activity of students based on teacher observation, namely 97.77% level of discipline, honesty 100%, 100% hard work and co-operation group (cooperative) 95.55%; 4) the results of the written test score obtained workmanship individual student worksheets obtained 97.77% with 3 student has not reached the SKM. Overall it can be observed through the following graph:



4. CONCLUSION

Selection of teaching methods and models by taking into account the student's character provides improved cognitive and affective aspects, in particular to sort material fractions and equivalent fractions in class VII SMPN 2 Rejoso. Through card games can also improve the affective aspect that is disciplined, hard working, honest, creative and cooperation in the learning process. Teachers, through Lesson Study activities, can increase professionalism in the field. Through innovation and creativity of teachers are expected to find new strategies or digging new knowledge for the betterment of the students.

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**LESSON STUDY OF CONSTRUCTIVIST APPROACH MATTER THROUGH
CONSTRUCTIVIST LEARNING TO CHEMISTRY EDUCATION STUDENTS OF
CHEMISTRY DEPARTMENT UNIVERSITAS NEGERI SURABAYA**

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Abstract: Constructivist approach, is part of topic of Learning Theories Course that given to students of Chemistry Education study program at the Department of Chemistry, State University of Surabaya. Learning of learning theory course had been done with various methods and strategies. Include the constructivist approach matter was conducted by the constructivist learning that hold with lesson study. The activities started from **plan** to design constructivist learning of constructivist approach matter. The essence of planning was essential that in the introduction step had been presented phenomenon that can construct the concept of constructivist approach to the student. And then implemented in the open lesson (**do**) that done twice and reflection (**see**) also performed twice. The results of the first open lesson reflection was used as references to re-plan learning design on the implementation to second open lesson. The results of this lesson study can be concluded that the constructivist approach matter of learning theories course which presented by using constructivist learning can be create student learning activities during the learning process since start to finish of the lesson; the interesting pattern of student interaction was found as a reference for design next or other lesson, and class management can be used as a reference for other learning in the other matter or other subjects.

Keywords: Constructivist Approach, Constructivist Learning, Lesson Study

1. INTRODUCTION

Education and learning develop rapidly in accordance to the demands of changing era. Experts always make improvements to the learning with learning innovation. Various attempts were made, among others through action research, study of learning or teaching and learning or lesson study. Study of learning with lesson study can be done at all levels, from elementary school to university. Implementation of lesson study in college to do with learning study courses.

Learning Theory courses is one of the subjects that must be programmed by students of Chemical Education study program in the Department of Chemistry, Universitas Negeri Surabaya. Description Learning Theory courses listed in Semester Lesson Plan year 2015 are: The study of the principles and the way students learn by studying the theory of behavioral, social learning theory, cognitive learning theory, constructivist approach, as well as motivating students to learn; and its application in the analysis of learning through case examples in class. The formula of learning outcome are; 1) Utilizing a source of learning and ICT-based learning media to support the implementation of learning by applying specific learning theory; 2) Comprehend theories of learning and able to apply in learning; 3) Make a decision based on the analysis of case studies of classroom learning and give ideas to choose various alternative solutions; 4) Have a responsible attitude by applying appropriate learning relevant learning theory.

To achieve the learning outcomes that have been formulated, the matter of study materials are covered in course descriptions and broken down into details of the study materials. Material about Constructivist learning covered, 1) Revolution constructivist education and an overview of the basic principles of constructivist, 2) description of how to teach cooperative learning, 3) description of how to teach problem-solving and critical thinking, requires the study of how the presentation that the students animate material Learning is about constructivist.

Form of lectures conducted by the lecturers team of Learning Theory course is to use various models of learning with lectures, demonstrations, discussions and role playing, which is adapted to the characteristics of materials or concepts in Learning Theory course.

At the time of teaching, the lecturer explained based on Semester Lesson Plan (Rencana Pembelajaran Semester / RPS) and the evaluation grid that has been developed jointly by a team of lecturers of Learning Theory course. Implementation of the learning process are not yet using Class Implementation Plan in detail, just based on the outline contained in RPS.

Therefore it is necessary for the implementation of Lesson Study to assess learning course material in particular learning theory constructivist approach through constructivist learning. Lesson study has been developed in Japan and widely adopted by other countries such as in Indonesia. Lesson Study is a model professional guidance for educators through the study and a sustainable collaborative learning based on the principles of collegiality and mutual learning to build a learning community. Through Lesson Study based courses are expected to be known how effective and efficient a learning activity.

Lesson study is a sustainable and collaborative process of study of learning activities based on the principles of collegiality and mutual learning to build a learning community "(Syamsuri I. and Ibrahim, 2011). With regard to the activities of the Lesson Study, according Mulyana (2007) has three stages, namely 1) Planning (Plan), 2) Implementation (Do) and 3) Reflection (See). At this activity on stage of the Plan, the lecturers of Learning Theory course collaborate to develop a lesson plan that reflects a student-centered learning. Planning begins with activities of need assessment and problems that faced in learning, so that can know the real conditions that will be used for learning. Hereinafter together also sought completion of the problems identified, so that the lesson plan is a plan that is really better, in which can anticipate all possibilities that will occur during the implementation of learning, from the preliminary stage, the core stage and the end of the lesson.

At the stage Do, there are two main activities, namely: 1) the implementation of learning undertaken by lecturers models that have been agreed or mutual consent to practice lesson plan 1 which has already been agreed and 2) observation by observer as members of lecturers team of learning theory subjects or another community. The purpose of observation at the implementation stage include: investigate the activity of students in the form of student interaction between students and other students, students and teaching materials, students and lecturer or students and the media during the learning takes place, as well as setting of seating. The third stage is the See (reflection), which discussed the results of a reflection on inputs from observers as a provision in order to improve the next learning process. This activity is performed discussion that starts from the delivery of impressions lecturers models, subsequent delivery of responses and suggestions are supported by evidence from observations of the observers and not of opinion. Results of reflection can be used as feedback to all participants for the benefit of the repair or improvement of the learning process next.

Based on the description of the background of the problem in this activity are:

1. How does the study of learning about constructivist learning model STAD cooperative based constructivist through lesson study?
2. How is the implementation of lesson study by conducting open lesson on learning theory courses start from planning, implementation, and reflection and improvement

The aim of the activities of implementing Lesson Study this time particularly in the Learning Theory course especially on material constructivist approach is as follows:

1. Describing the study of learning process of student centered leaning and constructivist approach materials through a constructivist learning.
2. Implementation of lesson study by conducting open lesson on learning theory courses, from planning, implementation, reflection and improvement

2. METHOD

Activity Lesson Study on Learning Theory courses through the following stages:

1. Stage Plan, lecturer model or the learning conductor prepare lesson plan that was created together with the team of lecturers Learning Theory, by analyzing the needs and concerns of students sharply, start from basic competence, how to make students learn, anticipate the lack of facilities and means of learning and so forth, Preparation of the lesson plan can also be done by an lecturer model independently and later discussed with the team, so that the resulting lesson plan better than by herself.
2. Stage Do, for implement lesson plan that were prepared in stage plan, was hold open lesson together, there were observers colleagues or cognate to know the feasibility of learning.
3. Stage See, reflect on learning activities that have been performed at open lesson to obtain useful input for the improvement the next teaching and learning process.

Efforts presentation constructivist learning materials that students animates the material being studied is about constructivist in this activity was done with constructivist based learning by using STAD cooperative learning model. It is hoped can be more meaningful learning for students.

3. RESULT AND DISCUSSION

On the implementation of this lesson study activities, lecturers team of Learning Theory course can't be involved all. They can't join at the stage of plan, do, or see due to various causes, among others; along with a schedule of teaching in other subjects, schedule testing proposal or thesis, or other activities. Nevertheless lesson study activities can still be carried out with twice the open lesson by two members of team lecturers only. The result of the lesson study activities can be described below.

Planning (Plan),

At this stage of the Plan, the lecturers team of Learning Theory course collaborate to develop a lesson plan that reflects a student-centered learning. Planning begins with activities of need assessment and problems faced in learning, like:

- Materials: The learning materials of student centered and constructivist learning required to learn with constructivist learning examples that students can animate with a direct view examples of teaching practice.
- Instructional Media
- Student Worksheet
- Problems: How to organize learning constructivist materials with constructivist learning; What the model of learning was used in a constructivist learning materials, How to design a constructivist learning materials.
- Students: Students of Education Chemistry class A year 2015 (36 students)
- Team:
 - Model Lecturere: Dr. Utiya Azizah, M.Pd.
 - Observer : Mitarlis, .Pd., M.Si.
 - Documentation: Mitarlis, S.Pd., M.Si.

Constructivist-based learning model that can be used include cooperative learning model. In this activities the model was used STAD (Student Team Achievement Division). cooperative learning. With STAD cooperative learning-based constructivist, students are expected to construct their own knowledge about the constructivist approach. The activity on plan stage shown on Figure 1.



Figure 1. Activity of *Plan 1*

Activity of plan 1 was generated learning materials that consists of a lesson plan that will be implemented in stages DO, Student Worksheet that were completed with Hand Out was available.

Doing open lesson 1 (20 April 2016)

At the Do stage, there were two main activities, namely: 1) Implementation of learning based on lesson plans that have been prepared together (learning designed using STAD cooperative learning model) student-centered learning materials and constructivist. 2) Observations by team members lecturers of Learning Theory course or from another team course. Learning Theory course in this activity was programmed by the students of Chemistry Education program year 2015 class A (36 students). The student divided into 9 groups. Observers observe student activities in group or class.

Student activities in group

One example of the observation result presented on Figure 2.



Figure 2: Student interaction patterns in groups

Figure 2 shown that members of 4 students in one group split into two groups. Each student discussion in pairs. (A) Group 5 and (B) Group 2 are divided into two groups.

Another students activities on learning process of constructivist approach by using constructivist learning in a group presented on Figure 3. There are many activities like discussion between students in a group or new group, doing worksheet together, or reading the literature from hand out or another resource like gadget.



Figure 3 (A) students doing worksheet together, or (B) individually, (C) student reading other the literature from website by using gadget.

Interaction Student with media and their work result

The result of student work in this activities shown different type, there were summary on thier book, worksheet, or highlight on their hand out.

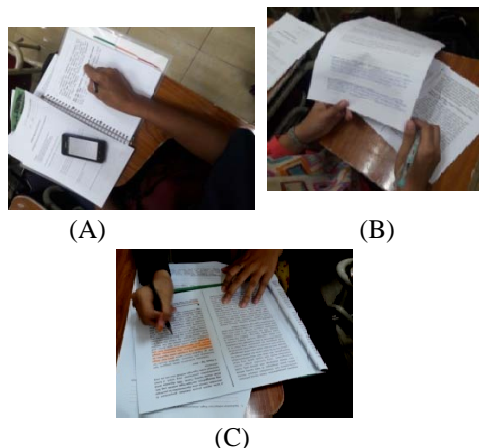


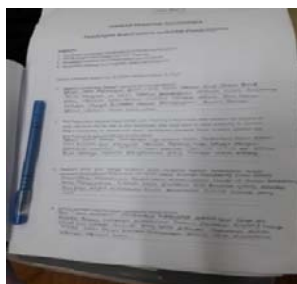
Figure 4 Type of student interaction with learning media and their work result

- (A) Student make summary on their note,
- (B) Sudent do the task on their worksheet and re-check their answer
- (C) Student make highlight on their handbook

Reflection open lesson 1 (21 April 2016)

From the observation and reflection, not all worksheet filled by each student in the group. Almost all groups just filling the worksheet completely which will be collected and presented. While others worksheet only partially filled grain task. Methods of student work in cooperative groups is to share the task of working on particular points. After that they share their answers to complete one worksheet on each task item.

From the result of reflection can provide input that in a group consisting of four people quite given two worksheets, one as an archive and one for collected each group filled completely. Students can work cooperatively in groups. Completed worksheet presented in Figure 5.



Figur 5. One page of completed workssheet

The third stage is the See (reflection), namely the learning process improvement efforts. This activity is performed discussion that starts from the delivery of impressions lecturer organizers (Lecturer Model) open lesson.

a. Impressions Model Lecturer:

During this lecture is given with explanations / lectures, efforts to enable students to frequently asked questions and discussed using a STAD cooperative model implemented aims to enable the students. Model lecturer describes the enforceability of learning by design have made in the lesson plan 1.



Figure 6 Describing the enforceability of learning on open lesson 1 by lecturer model

Lecturer models reveal the impression of the implementation of learning particularly about enforceability constructivist learning through the presentation of the pictures and learning interactions and students were asked to look. Thus students can construct their knowledge about constructivist approach through constructivist learning.

Reflections from an observer on the implementation of the open learning lesson 1.

Observers describe the activity of students during learning, there are on the record, given a highlighter, etc. Observers reflect student learning activities (Group 1) and Group 5 the division of the group again inadvertently. Based on observations of the observer looks conformity with the impressions conveyed by the lecturer on the implementation of STAD cooperative learning model on the course material constructivist learning theory.

Put that are considered important to the outcome of reflection open lesson activities 1 include:

1. Learning is presented in an interesting which makes the student can concentrate and be actively engaged in learning from the beginning to the end of the lecture.
2. Learning constructivist presented with a constructivist approach using STAD cooperative model begins with motivation for students to construct about constructivist theory. (Comments of observer: When the plan stage had predicted a philosophical aspects of epistemology in the process of acquiring knowledge through a constructivist approach).

Lecturer models will be designing their motivation that can be used to present the lesson. Finally obtained the appropriate form of motivation by providing visualization of the interaction analogy as contained in the lesson plan and executed in the open lesson 1. The visual media presented in Figure 7.



Figure 7 Visual media as a metaphor on introduction step as motivation

Students are enthusiastic to participate in the learning course on constructivist theory of learning materials with a constructivist approach using STAD cooperative learning model from the beginning to the end of learning.

Motivation of students indicated also by the active intraksi between students and lecturers, students with student and student-teaching materials.

Observed learning styles which attract between male and female students, students of dominant just read, is not supported by other activities, even the notes are still empty (student initial: Fhm), a student when reading is supported by other activities such as underlining, summaries or notes key sentence in their note.

In the working group there is an interesting interaction patterns as between members of the group.

- a. Members of the group split again into two, each discussing in pairs.
- b. Group members do not separate and discuss together.
- c. Group members do not separate but each learn on their own individually.

Another interesting thing, though students (Fhm) is not recorded but active in expressing their opinions.

There are students who do not do the worksheet, but using the gadget as a source of learning, and not all worksheet is required.

Based on the notes and interesting insights and considered important, some things are used for designing the open learning lesson 2, for example, worksheet do not need to be given to all students.

Planning (Plan 2), (25 April 2016)

At this stage of the Plan, the lecturers team of Learning Theory course collaborate to develop a lesson plan that reflects a student-centered learning, based on feedback on the activities of reflection on DO and SEE 1.

Important things from the open lesson 1 reflection include:

- Learning: Learning media such as the open lesson 1, in the form of power point and handouts, meeting 2 is not necessary anymore.
- Student Worksheet need not be given to all students.
- Materials: a student-centered learning and constructivist

Implementation (Do) and See 2 (27 April 2016)

At the stage Do ,:

- a. Implementation of learning based on a plan RPP 2 2 which was revised based on the reflection 1
- b. Observation had been done by members of the lecturers team of Learning Theory courses
- c. Learning Materials: student-centered and constructivist.
- d. Implementation learning theory course in the room C5.01.08

Students more active in the implementation of learning in the open lesson 2, In addition student have more activities like discussions, do the task in cooperative groups. Students ready to learn from the beginning and participated by answering questions on apperception activities from lecturer at a introduction stage.



(A)



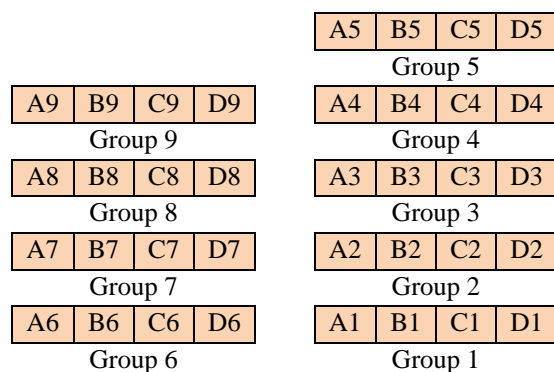
(B)



(C)

Image 8 The implementation of learning in the open lesson 2, (A) lecturer model of the activities apperception at a introduction stage, (B) the activity of the students by utilizing the whiteboard at the time of presentation, (C) students seem discuss cooperatively to answer questions from other students at when the presentation.

Constructivist learning activities with STAD cooperative learning in a group of students were transpiring actively. There were many interactions in a group or in class. The interaction can be described like patter that shown in Figure 9.



Table

White board
and display

Figure 9 Setting seat and interaction pattern of student in group on open lesson 2

Based Image setting the seating can be explained that the students interaction in the group in general transpiring actively from start to finish. Description for this figure, show that group 1 discussion blend of four members, two groups going good cooperation, early share into two groups (A2 and B2, C2 and D2), and then bargain collectively. Group 3 there are students who are less active discussion as students 3C. Group 4 is a discussion going among three students 4B, 4C and 4D, while students 4A taught himself frequently or use gadget. Group 5 in communication medium. The results of discussions on cooperative group work followed by a presentation and question and answer.

Reflection 2 (28 April 2016)

Submission impressions organizers by model lecturer on open lesson.

After conducting open lesson 2 model lecturer feel discover new things spontaneously in Learning Theory lecture improvement that can be studied include:

- Method of presentation regulation very nice technique by showing a group that will be a presentation using a lottery. Thus caused whole group is ready for doing presentation.
- The group that runs performed a select group by mentioning the topic goes.
- Question and answer progressing well
- Student groups presenter can still negotiate while the presentation. It can motivate students to pay attention to the current presentation group.

4. CONCLUSSION

Based on the results of activities Lesson Study Based Programs that have been implemented in the subject matter constructivist learning theory can be summarized as follows:

- Activity of Department Based Lesson Study (DBLS) programs of Learning Theory course on student-centered learning and constructivist material can be done well, consisting of phases carried out 2 times; Plan 1 and 2. Phase Do and See, accomplished Do 1 and 2, and reflection 1 and 2.
- Efforts to enable students by using models based constructivist learning like STAD cooperative learning has been active from the beginning until the end of the lesson.
- STAD Cooperative learning could take place, with students actively involved from start to finish learning the interaction patterns that vary in cooperative groups.

Suggestion

The study results of this study can be suggested that the approach to teaching or learning model can be applied directly to the model that will be taught, such as lecture material in this activity is to teach student-centered learning and constructivist learning with constructivist based learning like STAD cooperative learning. Similarly to other approaches or models that can be taught using the model.

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The Collaborative Learning Implementation in Learning-Forest Prototype through *Lesson Study* for Biology Education Students

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Abstract: the objective of this collaborative learning implementation was to facilitate students' learning activities and to build learning communities. Learning was conducted with collaboration in Plant Morphology subject. Learning was conducted in the forest-prototype learning with *Lesson Study*. Students learned about plant morphology structure. This collaborative learning implementation improved students' activities and built learning communities. The average grade of students' activities was 89.53 with very good category. Students learned collaboratively with contextual instrument. This collaborative learning could be done with a good planning, so that learning became open, democratic, and meaningful.

Keywords: collaborative learning, learning forest prototype, lesson study.

1. INTRODUCTION

Learning conducted by educators should emphasize meaning learning and contextual concepts. In learning, learners are empowered to be able to associate textual knowledge and contextual reality. In learning, lecturers as learning facilitators should be able to create a learning condition that is associated to the real world. Biology subject learning can be done with creation and innovation in an environmental-based-learning. The environment in a wide term is a meaningful learning source. The student understands that a living being interacts with other living beings, things in the environment, plants and animals, air, water, and land. Human being is one of members in living environment who has an important role in the relationship sustainability in that system (Utomo, 2011).

Environmental use is able to improve students' activities, develop students' curiosities, students' cooperation with groups of learning, ability of thinking critically, transfer multidisciplinary knowledge, collected information, to be analyze and synthesized from various sources and perspectives (Muhfahroyin, 2007). A contextual learning has seven main components; (1) constructivism, students are able to construct understanding along with learning experiences and give meaning through real experiences; (2) inquiry, students are able to discovers by themselves the concepts, facts, and principles in daily life; (3) questioning, students are able to ask questions to drive understanding to explore and to master; (4) learning community, students build learning communities to obtain perfect understanding to prevent misconception; (5) modeling, students construct a modeling that can be imitated and developed in learning to facilitate understanding assimilation; (6) reflection, students reflect what they have done to contemplate, to take meanings, and to use the meanings in constructing understanding in the future; (7) authentic assessment, the assessment of all learning processes have done, from the beginning to the end (Depdiknas, 2002).

Contextual learning means that students are able to process knowledge from main material meaningfully and learning is conducted with varying methods (Silberman, 2001). Information processing is conducted with students' thinking abilities (memory, experience, and action). Relationship patterns of classrooms with environment outside the classrooms are emphasized to synchronize knowledge have been built inside students through constructivism. Student's knowledge is reflected again for further development through collaborative learning, self-discovery, and mutual learning (Saito et.al, 2015).

After all learning sequences have been done, students conduct reflection on their understanding for the next learning activity by building further understanding (constructivism) to the main material concept (Depdiknas, 2012). According to social constructivism theory, during learning process students experience conceptual changes as result of social and academic interaction. These contextual changes are

enlightenments into their more complex understanding and improvements of critical thinking abilities (Depdiknas, 2002; Muhfaroyin, 2012).

Empowered learning sources for students to understand knowledge cognitively and in psychomotor have been widely developed, but real learning sources in nature (contextual) which are able supply students in cognitive, affective, and psychomotor domains which build environmentally concerned characters have been rarely developed. Through a fundamental research, a learning source with initiation of critical land based project, which previously did not have educative and economy values, was developed (Muhfaroyin, 2013). The land was empowered for learning into forest-prototype learning with educational benefits which were able to build environmentally care characters for students. The development of this forest-prototype learning supported environmental issues such as global warming, climate change, Let's Go Green program, One Man One Tree program, and Save Our Earth program. In the context of learning, this research is in synergy with philosophies of constructivism, character building, student-centered learning, cooperative learning, and contextual teaching and learning.

Through the learning-forest prototype, students are trained to think critically, cultivating environmentally care attitude, and skilful in representing cognitive, affective, and psychomotor domain (Muhfaroyin, 2015). Learning can also be conducted by implementing lesson study for learning community (LSLC). Depdiknas (2009) states that lesson study is an educator profession training model through examining learning collaboratively and continuously based on principles of collegiality and mutual assistance to build learning community. In this type of learning activity, collaboration occur between students; mutually learning, listening, and helping (Sato, Masaaki, 2012; Sato, Manabu, 2012).

Hendayana (2007) and Parmin (2007) explain that lesson study is an educational model for educator profession through studying learning collaboratively and continuously based on principles of collegiality and mutual assistance to build learning community. Lesson study applies varying learning methods and strategies based on situations, conditions, and problems faced by educators.

In the Lesson Study, teachers collaboratively 1) learn curriculum and formulate learning objectives and development objectives for their learners (developing life skill), 2) design learning to obtain objectives, 3) conduct and observe a research lesson, and 4) conduct reflection to discuss next learning (Lewis in Susilo et.al, 2009). A learning conducted in LSLC emphasizes on collaborative learning. Students learn in togetherness, by mutually assisting, listening ideas and opinions among learners in a collaborative group (Saito *et.al*, 2015).

2. METHOD

This collaborative learning was conducted in Plant Morphology subject for students of Biology education, in even semester of academic year 2014/2015. Learning was conducted by implementing *lesson study for learning community*. The activity was started with a *plan* with an objective to produce learning design.

The *plan* was conducted collaboratively by lecturers teaching the subject, other lecturers, and postgraduate students. This activity discussed the lesson plan. Student's activity sheet, field activity guidance, student's activity observation, and other learning equipment. The subsequent activity was learning implementation (*do*); the implementation of collaborative learning by students with forest-prototype learning. Model lecturers conducted Plant Morphology subject learning for undergraduate students, while other lecturers and postgraduate students were observing. The observations were focused to students' learning activities; observing, asking questions, answering, discussing observation result on collaboration of each student in the group.

The final step was reflection activity (*see*); where model lecturers delivered their observations and then followed by information found by other observers. The objective of this activity was to find out advantages and shortcomings of the learning conduct, especially discussing students' learning activities by using forest-prototype learning. The descriptive analysis from collaborative learning conduct would be used to describe students' learning activities.

3. Result and Discussion

The success of the integrated learning can be described from students' learning activities of observing, asking questions, answering, responding, and cooperating. The grades of students' learning activities in learning-forest prototype is visualized in Table 1.

Table 1. The average score of students' learning activities.

No.	Activity	Group									Average
		1	2	3	4	5	6	7	8	9	
1	Observing	92	93	94	92	91	93	97	96	93	93,44
2	Asking	89	90	92	87	89	91	94	96	97	91,67
3	Answering,	82	81	85	82	86	84	84	83	81	83,11
4	Responding	85	83	84	81	84	86	89	90	85	85,22
5	Cooperating	95	90	94	96	95	97	93	97	91	94,22
Average		88,60	87,40	89,80	87,60	89,00	90,20	91,40	92,40	89,40	89,53

Based on the Table 1, learning activities of 54 students which were grouped into nine groups showed that the average grade of learning activity was 89.53 (very good category). The highest and lowest grade averages were respectively cooperating activity (94.22) and answering activity (83.11). The grades of asking question and responding were 91.67 and 85.22 respectively. The grades of students' learning activities in forest-prototype learning is visualized in Figure 1.

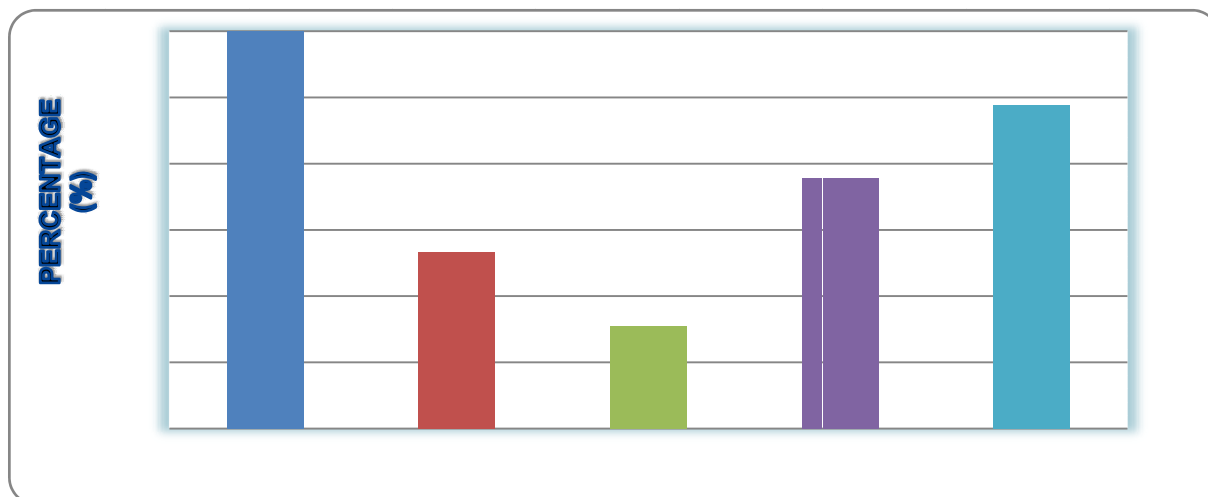


Figure 1. The average of students' learning activities in learning-forest prototype.

Based on the Figure 1 showed that students' learning activities in forest-prototype learning belong to very high category. This was because the learning was conducted in contextual environment, so that students were enthusiastic to find out many things related to lesson substances in the location of forest-prototype learning. This is in accordance to Muhfahroyin statements (2007, 2013). Cooperating activity has highest grade amongst other activities. This indicates that this learning facilitates collaboration where students are mutually learning and assisting, and there is no students is ignored in the learning (Sato, 2012; Saito *et al*, 2015)

By learning-forest prototype , students are trained to think critically, able to build environmentally care characters, and to work skilfully and these represent cognitive, affective, and psychomotor domains (Muhfaroyin, 2015). These students' learning activities are related to implementation of lesson study for learning community (LSLC) which is planned and observed during the learning processes. This is in accordance with Saito et.al (2015) that learning which is conducted in LSLC emphasizes on collaborative learning. Students learn in togetherness, mutually assisting and listening ideas and opinions amongst them in a collaborative group.

4. CONCLUSION

Collaborative learning in learning-forest prototype through lesson study is able to improve students' learning activities; observing, asking questions, responding, and cooperating. The average grade of activities in this learning is 89.53 (very good) and the highest grade is cooperating activity.

Recommendation

After implementing this collaborative learning, the researcher recommends that in activating students' activities, lecturers can conduct biology learning by using learning-forest prototype through lesson study. In the implementation of learning, proper Instrument and model based on the context of environment use as learning sources can be developed.

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2 Sharing and Jumping Task Learning Design of Empirical and Molecular Formula Concept

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Abstract : Instructional process is a sharing activity which students learn from each other. Learning activities involve different students' abilities. Therefore, the design of learning activities using two types of activities, which are a sharing activity (sharing task) with have same level of textbooks and must be understood by all students, and jumping activity (jumping task) that exceeds the level of textbooks. The lack of didactic anticipation is reflected in instructional planning that why students' learning obstacle appears. The aim of this study is to produce an instructional design of sharing and jumping task to prevent students' learning obstacle on Empirical Formula and Molecular Formula concept. Subject of this study is 57 students of X IPA 1 and 2 in Laboratorium UPI High School. We apply descriptive qualitative method. We collected data through TKR (Tes Kemampuan Responden), observation sheets, interview guideline. We implemented the lesson design twice in different group of students. The result of first implementation, in sharing task activity students were ~~are~~ not active in the group discussions so that there are still learning obstacles appears. However, in jumping task activity, students become more active in discussion because the students are faced with a new situation of challenging problems, although they still need help from teacher. Revision of instructional design is implemented on second class. In second implementation, group discussions on sharing task activity is more active so it can minimize students' learning obstacle, although still need help from teachers. But in jumping task activity, there are still many students who can't catch the concept and they still need help from teacher. Based on the results of ~~both~~ these implementations, we ~~it is~~ obtained an tried out instructional design of sharing and jumping tasks that provide good advantages for students who have high or low ability.

Keywords : Learning Design, Sharing and Jumping Task, Empirical and Molecular Formula.

1. INTRODUCTION

Education is a major factor in the formation of character and quality human resources. Moreover, the success of a country can be measured by successfulness of country in education to create intellectual people. Recognizing this, the government is very serious about dealing with the education system, because with a good education system can produce generation which qualified and able to adapt to living in a society, nation and state. The seriousness of the government in improving the education system is also demonstrated by the development of the curriculum from year to year.

Curriculum development undertaken by the government is based due to low student achievement. It can be seen from the results of TIMSS (Trends in Mathematics and Science Study), which is one of the international assessment which aims to see the content and the thinking of students in mathematics and natural science. Based on data from TIMSS in 2011, Indonesia was ranked 40th out of 42 countries. Indonesian student achievement is on a scale of Low namely students were only able to identify a number of basic facts but have not been able to communicate and linking various science topics, can't be able to implement complex and abstract topics. The low of Indonesian students achievement in science, indicates the ineffectiveness of the learning process that occurs.

Collaborative learning is learning which is based based on Vygotsky's theory of social constructivism. The theory of social constructivism is known as the Zone of Proximal Development (ZPD). ZPD Vygotsky's theory refers to the attainment of knowledge is done by providing scaffolding, scaffolding offered to the students not to be done by teachers, but can be done by peers who have higher academic ability. Scaffolding that given by teachers in the form of questions, directives, and instructions to guide the students achieve understanding of the concept. While scaffolding from peers are working together to accomplish a task that is done through discussions. Wiersema (2000) states that collaborative

learning is philosophy: working together, building together, learning together, changing together, improving together. While collaborative learning by Sato (2014) is a study carried out in the group, which aims to encourage students in the group to find a variety of opinions or thoughts incurred by each individual in the group. In collaborative learning occurs studying the relationship between students who have high academic ability with students who have low academic ability.

The learning process does not happen in the unity, but the learning is the result of diversity or difference. In learning activities involve the ability of the diverse students' understanding and therefore teachers design lessons using two types of topics, sharing task is the individual tasks through collaborative small group that contains the basic materials in the level textbooks and to be understood by all students, and jumping task is a problem that given to increase (jump) higher student ability. Problems in the jumping task contains basic materials have been developed (beyond the level of a textbook) is the material application of the basic concepts. (Sato, 2014). On learning task sharing and jumping can benefit all students both students who have low cognitive abilities or students with students who have higher cognitive abilities. In this study not only increase students 'cognitive abilities but also improve students' affective and psychomotor.

Chemistry concept in this research is empirical formula and the molecular formula concept which is an abstract concept that is the principle. Based on the results of several studies on the topic of empirical and molecular formula and students' understanding of the empirical formula and the molecular formula, it was found that the students had some barriers to learning in understanding this concept. Based on research of Nassiff Peter and Wendy A. Czerwinski (2014) shows that students learn to do calculations in accordance with the directives empirical formulas or calculations existing instructions without getting a deeper understanding about the concept. For example, when solving the problem of the empirical formula, students share the divide (or mass percentage) of each element of the molar mass with the lowest number of moles to find the ratio of the element, and then find the smallest ratio of the total. While this approach will lead to the right answer, but students do not understand in depth what they are doing and understanding the underlying chemical concept.

This study investigate how the design of collaborative learning sharing task and jumping task on the topic of empirical formula and molecular formula can overcome students' learning obstacle. Based on this, the research question are:

- a. How is characteristic of students' learning obstacles that is identified in learning empirical formula and molecular formula concept?
- b. How is the design of collaborative learning sharing task and jumping tasks in the topic of empirical formula and molecular formula concept?
- c. Is the implementation of collaborative learning design of sharing task and jumping tasks can overcome students' learning obstacles in empirical formula and molecular formula concept?

2. RESEARCH METHODOLOGY

This study reviews about learning process, student activities during learning process, and the students' learning obstacles in learning chemistry concept. However, the focus of this research is to develop a didactic design based on students learning obstacles so that produce learning design which is expected to develop into a better direction. Participants in this study are teachers and students. Participant of students in this study consist of three groups. First participants are second semester students in grade IX which is the participant who have learned empirical formula dan molecular formula concept to identify students' learning obstacle in this concept. The second participant is a student in grade X who will be taught about empirical formula and molecular formula concept based on first collaborative learning design which have been designed. The third participant is the students in grade X who will be taught about empirical formulas and molecular formulas concept according to the collaborative learning design revision from first implementastion which has been designed according to the lesson analysis and teacher' self-reflection. Collaborative learning design is implemented in twice with the same concept of chemistry but different group of class.

Research design that used in this study is didactical design reserach. According to Suryadi (2013) studies the didactic design basically consists of three stages:

- 1) prospective analysis
- 2) analysis metapedadidaktik
- 3) retrospective analysis

The instrument which are used is TKR (Tes Kemampuan Responden), observation sheets, interview guideline. TKR and interview guidelines are used to identify students' learning obstacle before designing the lesson and to determine whether students are students' learning obstacles can be solved or minimized, while the observation sheet is used to analyze the implementation of collaborative learning in both classes. TKR consists of 3 questions which is tested to 15 students in grade XI who has been studying about empirical formula and molecular formula for identifying students' learning obstacles on this concept before designing collaborative learning sharing task and jumping task. TKR is also tested to class X after implementing collaborative learning sharing task and jumping task.

3. FINDING AND DISCUSSION

In preparing a lesson design is required an identification of students' learning obstacle in the concept of empirical formula and molecular formula. Students' learning obstacle is derived from the analysis of the results students' answers in TKR and reinforced by the results of interviews with some of the students who have done the test. Based on the results of the initial TKR and interview of students are obtained students' learning obstacles in the concept of empirical formula and the molecular formula are:

- 1) Students do not understand the meaning of the empirical formula and the molecular formula
- 2) Students do not understand the meaning of mass percentage
- 3) Students are not able to determine the simplest ratio of mole from each element
- 4) Students do not understand the meaning of relative atomic mass (Ar) with relative molecular mass (Mr)

Brousseau (2002) states that the error is not only a result of ignorance, uncertainty, chance but the effects of previous knowledge interesting and true, but which is now declared as wrong knowledge or can not be accepted easily. Errors of this type of uncertainty and unpredictable, it is called learning obstacle. Learning obstacle occurs naturally by students in learning process.

Students' learning obstacles that have been identified through the initial TKR and supported by interviews of students that became basis to design a lesson design which can minimize students' learning obstacles. Learning design consists of Chapter Design and Lesson Design. In Chapter Design consist of essential concepts, time allocation, way of learning, learning objectives, skills are developed, and how to evaluate (Fitriani 2015). Learning method that used to build concept of empirical formula and the molecular formula is group discussion. Students were divided into eight groups, each group consist students who have high, medium and low ability. The group division is based on the level of student's ability so that discussion can be run well and students can learn from each other (sharing knowledge).

Lesson Design is a detail of steps from chapter design and anticipation that is prepared to face prediction of students' responses that may occur in learning process which aims to minimize students' learning obstacles. According to Vygotsky that a good learning environment can help students to achieve their potential abilities. In lesson design consists of three activities, initial activity (apperception), the core activity (sharing activity) and the closing activity (jumping activity). At the core activity consists of sharing task activities that facilitate students in developing potential development while in the closing activity is jumping task activity.

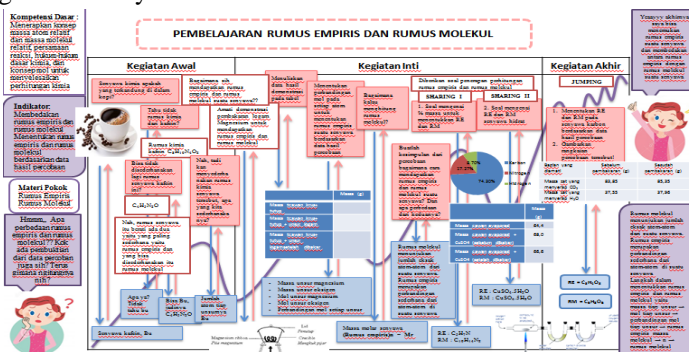


Figure 1. Collaborative learning design

In apperception, teacher pose questions to the students about the compounds that exist in coffee. Prediction of students' responses is students can answer caffeine as a compound that exist in coffee. Students are given activity to observe atoms which form caffeine as well as the number of atoms of each element. In core activity, students are watching video experiment about combustion of magnesium to determine the empirical formula and the molecular formula. Activity that given in the core activity is students practice to determine the empirical formula and the molecular formula in students' worksheet that has been provided through discussion group. These core activities are is called "sharing" activity because it occurs inter-group cooperation to solve the problems, the interaction occurs in stating opinions or ideas. Students' worksheet consists of two questions that correspond to the level of the textbooks that must be understood by all students. In the closing activity is "jumping" activity. At this activity, students are given the problems which level of difficulty is beyond textbooks and about application of concepts in daily life. Problems that given in jumping activity is determine the molecular formulas of the combustion of Vitamin C.

After first implementation of collaborative learning design of sharing task and jumping task in empirical formula and the molecular formula concept is conducted TKR 1. Based on analysis of student answers, there are still students' learning obstacle are identified, it is obtained from students' answers which still made mistakes in answer the questions of TKR. But students' learning obstacles are already minimized. The following table distribution of students' ability to solve problems on the material TKR empirical formula and molecular formula. The percentage is to see how high students' learning obstacles in answering questions of TKR.

Tabel 1. Distribution of Students' Achievement in TKR I

Item	Amount of Students (n = 27)							
	Score 0	Score 5	Score 10	Score 15	Score 20	Score 25	Score 30	Score 35
1	0	0	0	0	2	1	11	13
%	0	0	0	0	7,4	3,7	49,74	48,15
2	4	0	1	0	4	8	10	
%	4,81	0	3,7	0	14,81	29,63	37,03	
3	0	2	1	3	1	3	4	13
%	0	7,4	3,7	11,11	3,7	11,11	14,81	48,15

Based on the table above, the percentage illustrate students' learning obstacles in empirical formula and the molecular formula is already minimized. It shows from the number of students who answered questions correctly. Obtaining the greatest percentage in question number 1 is 49.74% with a score of 30 that indicates almost all the students were able to answer the empirical formula and the molecular formula of the compound by answering the calculation stage correctly. In question number 2, gain the highest score at 30 which is the highest score with a percentage of 37.03%. Then in question number 3, the highest percentage gain in highest score of 35, which is about 48.15%.

In question number 1 is still found some students who get obstacle to interpret the percentage of mass from each element in a compound. Students also get difficulties in calculating the value of n so that students are not able to determine the molecular formula of the compound, it is seen at the students' answers which get obstacle errors in determining the value of n. This is because students' difficulties

in mathematical calculations. In question number 2 found student who get error in writing order of elements in the formation of compounds but almost all students can determine the empirical formula and the molecular formula of the compound by performing the steps necessary. It is also found students' mistake who do not calculate the ratio of mole in determining the empirical formula and the molecular formula. Students' mistake that identified in question number 3 same as in question number 1, there are students who do not understand the meaning of mass percentage. Overall students' learning obstacle in

the concept of empirical formula and molecular formula can be minimized. It can be seen from the reduction of mistakes that made by the students at TKR 1.

The results of teachers' self-reflection from lesson analysis and teachers' interviews are used to revise the design of collaborative learning design of sharing task and jumping task in the first implementation. The learning process needs to be improved for future learning process is more concerned in time allocation so learning objectives can be achieved, teachers were more responsive in anticipating in variety of student responses that appear beyond prediction, reduce teachers' involvement in group activities. Revision of collaborative learning design of sharing task and jumping task is implemented on second class. After first implementation of collaborative learning design of sharing task and jumping task in empirical formula and the molecular formula concept is conducted TKR 2.

Items Test	Amount of Students (n = 30)							
	Score 0	Score 5	Score 10	Score 15	Score 20	Score 25	Score 30	Score 35
1	0	0	0	4	7	5	11	3
%	0	0	0	13,33	23,33	16,67	36,67	10
2	5	0	4	0	2	17	2	
%	16,67	0	13,33	0	6,67	56,67	6,67	
3	1	0	0	4	4	2	16	3
%	3,33	0	0	13,33	13,33	6,67	53,33	10

Tabel 2. Distribution of Students' Achievement in TKR 2

Based on the table above, the highest percentage gain in question number 1 is 36.67% with score of 30. In question number 2, gain the highest score of 25 with a percentage about 56.67%. Question number 3 gain the highest percentage on a score of 30, which about 53.33%. In question number 1 is still found some students who get obstacle in calculating the mole ratio. This is because students' difficulties in mathematical calculations. In question number 2 found a mistake in calculating the relative molecular mass. While there is no obstacle that identified on question number 3.

Students' learning obstacle in concept of empirical formula and molecular formula can be minimized. It can be seen from the reduction of mistakes made by students in the TKR in first implementation and second implementation. There four types of students' learning obstacles in first implementation, while there is only two types of students learning obstacles.

4. CONCLUSION

Conclusion of this research is that collaborative learning design of sharing task and jumping task can minimize students' learning obstacle in concept of empirical and molecular formula. There four types of students' learning obstacles in first implementation, while there is only two types of students learning obstacles. Collaborative learning design of sharing task and jumping task give students opportunity to build concept by themselves through group discussion, by pose scaffolding students can develop their ability from actual development to the potential development.

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IMPLEMENTATION OF MEDIA “WAYANG PRESIDEN” IN AN EFFORT TO ENHANCE THE KNOWLEDGE OF STUDENTS ABOUT THE HISTORY OF INDONESIAN REVOLUTION IN SDN 2 GROGOL

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Abstract: The unknowing of students about Indonesian revolution history is a serious threat for the young generation. “Wayang Presiden” is an education media as the introduction to Indonesian revolution through President’s life for elementary school students. This program is conducted for 4 months in SDN 2 Grogol, Kecamatan Sawoo, Kabupaten Ponorogo. This is a qualitative research with triangulation method and descriptive qualitative analysis. The results of this research program are 1) media “Wayang Presiden” is very effective as a media of introduction to Indonesian revolution through President’s life from education, cultural, and economic aspect. 2) This media makes the students become enthusiastic in learning, the students can learn, make, play, and perform “Wayang Presiden” by imitating positive characters from previous Indonesian presidents. Therefore “Wayang Presiden” media can enhance student’s knowledge about the history of Indonesian revolution.

Keywords: Media, “Wayang Presiden”, Revolution

1. INTRODUCTION

The development of knowledge and technology makes the rises of efforts of innovation in utilization technology results in teaching and learning process. The teachers are demanded to be able to use equipment provided by the school, and it is possible if those equipment are suitable with the development and demand. The teacher at least is able to use the cheap and simple equipment but it is a must as an effort to reach the aim of teaching. Beside able to use the available equipment, the teachers also demand to develop that available equipment, they also demand to develop skills in making learning media which will be used if the media is not available yet.

Therefore, the teachers must have enough knowledge about learning media (Hamalik: 1994: 6) including 1) media as communication tool to effective the teaching and learning process, 2) the function of media in reaching the education aims, 3) details of learning process, 4) relation between teaching method and education media, 5) value or use of education media in teaching, 6) election and using of education media, 7) kinds of equipment and techniques of education media, 8) education media in every lesson, and 9) innovation effort in education media.

It can be concluded that media cannot be separated from teaching and learning process for the reach of education aim in general and teaching aim in school especially. The word media comes from Latin *Medius* language, literally means “middle”, “mediator”, or “conductor”. In Arabic, media is mediator or message conductor from the sender to the message receiver. If media brings messages or information aimed instructional or contain teaching meaning, that media called as Teaching Media.

Law Number 20 in 2003 Chapter II section 3 asserts that “National education is aim to develop student’s potential to be a devout and piety human to Tuhan YME, noble character, healthy, knowledgeable, capable, creative, independent, and be a democratic and responsible citizen.” It is appropriate with instruction in national education system, it can be concluded that education is not only to educate citizens but also education must be able to create piety or human’s characters. Thus it can form a prestigious nation based on UUD 1945.

Understanding the history of nation revolution is very important to increase the nationalism and build character of the students. The story of nation leaders can build a good character as the figure they learned.

But the existence of globalization and modern era rise negative effect that is can cause many people become reluctant to learn the history and story of the national figures to educate them.

Beside it is one of factors causing students become unattractive in learning the history of nation revolution because in the education process, the teachers do not facilitate their students. An educator must be able to create an attractive, conducive, and fun learning atmosphere, one of them is by making innovation in teaching media. One innovative teaching supporting is by using attractive teaching media. According to Hamalik, by the using of proper and appropriate teaching media with the lesson in the teaching and learning process, it can raisenewpretension and interest, raise motivation and stimulation in learning activity (Arsyad, 2010). One of alternative teaching media which can be used is by using Wayang media.

Wayang has been avowed as *Masterpiece of Oral and Intangible Heritage of Humanity*. Wayang has been avowed as masterpiece because wayang has high value of human civilization. On 7 November 2003, wayang of Indonesia was announced by UNESCO as the world masterpiece in France (Wibisono, 2009). It shows that wayang is one of traditional culture heritage, has been avowed internationally as a cultural heritage full of values which has big role in creating and developing nation character.

Wayang media is very needed in learning process as a media to introduce Indonesian revolution. In this case, wayang is made as visual aid in learning process used by the teachers in giving materials of president life by moving it using hands and forming president caricature picture. Therefore, in this case it called Wayang Presiden and next called WAPRES. WAPRES with caricature design is made from cardboard paper suit with President figure. Wayang caricature design will attract student's interest in giving material about Indonesian revolution through president's life. According to Levied and Lentz, the surplus of Wayang Cartoon media as teaching media is it can direct students to communicate, arouse student's emotion and attitude, accelerate aim accession to understand and remember information and help to understand text of students weak in reading (Ngadino, 2009). The utilization of wayang media is conducted with reason that WAPRES is very efficient to be used as teaching media because it is made from cardboard paper and bamboo which is cheap and easy to get. Beside WAPRES is easy to be made by cutting with scissor and tied the parts, so it can be similar with the president with certain design.

In formal education especially grade 4 of elementary school, material about president's history in national citizenship education (PKN) only commit to memorize. Communicative method in teaching is a trend in class learning process. The results of interview with Mrs. Espingatian as teacher of SDN 2 Grogol (24/08/2015) explained that "in a week elementary students of grade 4 get PKN lesson about 3 times with 35 minutes for each time." Therefore 105 minutes which can enhance student's knowledge in learning process become ineffective. It caused by unattractive learning process and lack of giving maximal use to the students.

2. RESEARCH METHODOLOGY

According to the background and purpose, this research is use qualitative research. Qualitative research is research used for examine natural condition of an object where the researcher is the key instrument (Sugiyono, 2005). In this research, the researchers use technique validity data triangulation by finding data from many sources, so it possible to get different data from those sources. William Wiersma, 1986 (in Sugiyono, 2014: 272) stated that triangulation in credibility trustworthy can be considered as checking data from many sources with many ways and times. Therefore, there are data source triangulation, technique triangulation, and technique data and time collecting triangulation.

Technique of data collecting is main step in a research because the main purpose of a research is getting the research data. The data collecting conducted by the researchers are as follow:

1. Interview

The researchers conduct asking and answering session with teacher and students of grade 4 from the beginning until the end of the research about the implementation of media "Wayang Presiden".

2. Observation

The researcher conduct observation in SDN 2 Grogol with aim to provide realistic pictures of behavior and happening to answer question, understand human behavior and evaluation. It can be conducted by the researcher by observing directly the learning process of grade 4 students. So the researchers are able to write the research results they observed.

3. Documentation

In this step, the researchers investigate the media used by the teachers especially in teaching material about President to grade 4 students. In fact, the teachers only use material book as the source to teach students.

This research is conducted in SDN 2 Grogol, Kecamatan Sawoo, Kabupaten Ponorogo. The location is far from the city, around 25 KM from city's square. Access to reach this school is so hard and located in edge of mountain, make this place is lack of government attention related to the supporting medium and school facilities, so there are some obstacles in conducting learning process especially media used by the teachers. This research started from April to Mei 2016. The research time is appropriated with school schedule.

3. TECHNIQUE OF DATA ANALYSIS

According to Sugiyono (2011: 137) there are two main things that influence the data quality of research results: quality of research instrument and quality of data collecting. This is a qualitative research, so it uses non-statistic data analysis. The data are words and not numbers, where the data are collected from observed behavior. The researchers use pre-test and post-test to identify how far student's knowledge about the history of Indonesian revolution before they are given "Wayang Presiden" media.

Data tabulation and data analysis is an important step in a research, since it gives meaning to the data collected by the researchers. In this research, data tabulation and analysis will be done through process of arranging, classifying, finding content from many collected data to get the meaning and relate it to the research topic. The last step of data analysis is conducting the data validity. The process of data analysis starts from analyzing, checking the entire data provided from many sources, summarizing, and focusing in important aspects. The collected data is result data from scores of pre-test question answered by the students before getting "Wayang Presiden" media and post-test question after getting "Wayang Presiden" media. Before "Wayang Presiden" media is applied, only 5 students who get good score and higher from the minimum score of the school that is 75, with students average score is 60. After learning using "Wayang Presiden" media, the students show higher score and the amounts of students who get good score and higher than minimum score are 22 of 25 students. The average score from the students is increase to be 80.

4. THE RESULTS AND DISCUSSION

a. The results

"Wayang Presiden" media is a new innovation in education. This innovation is aimed to enhance student's score and achievement. Before they are given "Wayang Presiden" media, there are only 5 students from the entire students who reach minimum score from school that is 75, by using "Wayang Presiden" there is impact to student's score, the results show that after this media is used, the amount of students who get higher minimum score is increase to be 22 students. It shows that "Wayang Presiden" media is very effective in easier students in understanding materials especially about the history of Indonesian revolution. This media also give education to the students about the importance of imitating the characters of the presidents and the needed to eternal the culture of wayang.

The following is three potential results gotten from "Wayang Presiden" media seeing from education, cultural, and economic aspects. The explanations are:

1. From education aspect, this media makes the students increasing their achievement and additional knowledge. The average score of students learning result with "Wayang Presiden" media reach 80 (post-test), from previous average score 60 (pre-test). Therefore by "Wayang Presiden" media can

enhance elementary students learning result. Beside the students can imitate President's characters as a good model. The characters they have been learned will be basic value in behaving and become reference in their daily life interactions by imitating noble characteristics of Indonesian Presidents.

2. From cultural aspect, this media can make the students of grade 4 to make and play wayang so they are doing an activity to eternal Indonesian culture.
3. From economic aspect, WAPRES media is a new innovation in making cheap teaching media because in the process of making WAPRES only use old cardboard and bamboo as the main materials.

b. Discussion

Piaget identified four main steps of the cognitive development: sensory motor step, preoperational step, concrete operational step, and formal operational step (Shaffer and Kipp, 2010: 253). Every development step has particular characteristic and related each other. Piaget in his theory about cognitive development, sensory motoric phase happens from 0 - 2 years old, pre concrete operational phase happens from 2 - 7 years old, concrete operational phase happens from 7 - 11 years old, and formal operational phase happens from 11 years old until present (Sanrock, 2007: 246). The students of elementary school are around 7 to 12 years old. According to Piaget approach about cognitive development, so the cognitive development of the students is in the third step that is concrete operational phase. In this phase, logic thinking replaces intuitive thinking (Sanrock, 2007: 254). The election of "Wayang Presiden" media as a teaching media to introduce Indonesia revolution through president's life has been fixed with the elementary student's development phase that is concrete operational phase.

In concrete operational phase, the children can use many mental operations, such as reasoning, solving concrete or real problems. The children in this age can think logically because they are not too egocentric from the previous phase and able to consider many aspects of situation (Papalia, et al, 2009: 443). During the concrete operational phase, the students are quick to get cognitive operation and apply new important skills when they think about object or happening they experience." (Shaffer and Kipp, 2010: 271). Moreover, "Wayang Presiden" media is very suitable as children cognitive development phase, wayang media will be easier the students in gaining knowledge. So the students will be easier in knowing Indonesian revolution and imitate the president's characters. It proves that by "Wayang Presiden" media, the average of student's learning results reach 80 (post-test) from previous average score 60 (pre-test). Therefore, WAPRES media can enhance the elementary students learning results. Beside the students also can imitate president's character as people with noble characteristics. The students can imitate the character of first president, Soekarno to Joko Widodo when they lead this nation. The characters learned by the students will be basic value in behaving and become reference in their daily life interactions by imitating noble characteristics of Indonesia Presidents.

The character education is a long process, learning process to give glorious values, sensibleness, custom/ tradition, and Indonesian values in developing students characters to be a value human, good citizen with nation and religion values (Sardiman, 2009).

The history proves that the character development and or culture of a nation are never can be separated from custom values underlying it. The history of nations around the world shows that an advance and big nation has long mythology tradition. In shaping characters, the students can imitate the history of president's life.

Substantially, pewayangan value is related with human's life problem in private, social, and religious life. Pragmatically, seen from aspects of human's life needed, wayang values is functioned to support the aim to live, survive, and develop life, those three matters are purposed to reach the perfectness of life. Human actions for living, surviving, and developing life must be reached with correct ways and purpose. These good characters of president figures become inspiration and guidance in developing character. With the result that by "Wayang Presiden", the students can recognize Indonesian revolution and imitate positive characters through president's life during president's leading period.

Nurgiyantoro (2011) explained that wayang is a masterpiece because it has high value to human civilization. Wayang is full of value either shown in the characters, story, or many supported elements. All of these matters are appropriate to be reference of developing nation character. "Wayang Presiden" as an introduction to Indonesian revolution has three potential results seen from education, cultural, and economic aspects.

Many important factors influencing student's interest to wayang media and cause the successful of this media in enhancing students learning results are:

1. Wayang media with previous presidents characters are never exist before and used in teaching process, so it causes student's curiosity about "Wayang Presiden" media.
2. "Wayang Presiden" media give more knowledge for students than other previous media used by the teachers, so the knowledge and students learning result is higher and enhance.

5. CONCLUSION

"Wayang Presiden" can be a media to introduce Indonesian revolution through president's life. The existence of Indonesia cannot be separated from traditional noble values in very long history in escorting the growth and advancement this nation, and one of them is wayang culture. "Wayang Presiden" is effective to be used as teaching media having three potential results from education, cultural, and economic aspects. Beside as teaching media aimed to enhance students learning result, "Wayang Presiden" can build elementary school students character. By learning, making, and playing wayang, the students can learn presidents characters, with result that it will be basic value in behaving and become reference in their daily life interactions.

6. ACKNOWLEDMENT

We would like to give the best gratitude to Ditjen Dikti in funding this PKM-M program about implementation of media "Wayang Presiden" in an effort to enhance the knowledge of students about the history of Indonesian revolution in SDN 2 Grogol". The writers also give gratitude to Mr. Nur Widodo, M.Kes in giving opportunity to join international seminar, guiding lecturer Mr. Sutaryanto and big family of SDN 2 Grogol in giving opportunity in conducting this PKM-M activity. Thank you very much for all leaders and academic staffs of IKIP PGRI Madiun in supporting this activity.

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Students' Critical Thinking Patterns in Teaching and Learning Subject Through Jigsaw Teaching Model

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Abstract: This study examines the critical thinking skills of students in lecturing session using jigsaw model. This research is motivated by the low level of critical thinking of primary teaching students seen by the number of students that are active in response to a statement, the phenomena and problems; the frequency of students in responding to a statement or argument, phenomena and problems posed by the lecturers as well as the quality of the responses given. Using the model of lecture type of jigsaw, The concentration increase participation in lectures by students because of the presence of the expert group and the original group, resulting in students who go back to the original group will deliver back results of the discussion of the expert group. Whereas in the group of experts, the students will feel as delegates from the original group who must actively participate in the discussion to a conclusion together. The study used a qualitative approach with descriptive analysis. The numbers of students involved in this study were 28 students.

The ability to think critically that are examined involve thinking in giving a logical argument, type of jigsaw lectures conducted for 3 cycles show that: 1) the number of students who give a verbal response of the phenomenon or problem set by lecturers increased; 2) the frequency of students who leave comments or questions increase from cycle to cycle; 3) granting the argument from cycle to cycle show improvement towards a more logical; 4) the analytical skills of students on the problems posed indicate an increased level of sharpness; 5) to improve student evaluation to provide alternative solutions.

Keywords: Critical Thinking, Model Class Type Jigsaw

1. INTRODUCTION

The results of measurements of Indonesian student achievement aged 15 through PISA (Program for International Student assessment) by the OECD (Organization for economic Cooperation and development) shows that Indonesian students have low ability in reading literacy, science and mathematics [1]. This fact indicated that Indonesian students aged 15 years have a lower ability to think. The ability to think is very rarely taught at elementary schools in Indonesia, in general, primary school tend to train concept of the thinking ability of students.

Primary School Teaching is a program of study that will produce prospective elementary school teachers. In order for those prospective teachers to be able to teach critical thinking abilities of elementary school students, the ability to think critically need to be trained to prospective elementary school teachers beforehand, one of them is through lectures in class. This is because in each lesson, teachers often become centers of learning (teacher centered), so that students do not have the opportunity to develop their knowledge and ability to think critically [2]

Thinking is talking to us in the mind and the mind of each of the things to consider, ponder, observe, analyze, and prove something and determine the results (Pramoedya 2006) [3]. Critical thinking is a process that aims so that we can make decisions that will make sense, so what we consider the best of a truth we can do it right [4]. Critical thinking is independent thinking, thinking for considering, or thinking for evaluating [5]

The ability of critical thinking is the thinking ability of learners to compare two or more information in order to acquire knowledge through testing for symptoms of deviant and scientific truth (2) In line with this, the Baron and Stemberg [6] suggest that the critical thinking consists of five basic things that is practical, reflective, reasonable, belief, and action. So we can say that critical thinking is a reflective mind that is focused on deciding what is believed to be done.

Critical thinking means also think that makes sense, to test inter-related variables, as well as identify and evaluate aspects of a problem or phenomenon and focus on the final decision to be taken and done. Someone who does not have the ability to think critically will be low in terms of confidence and lack of skill in making decisions. By having the ability of critical thinking skills, the person will have the confidence to argue and make decisions.

Teaching and Learning Course in Primary School Teaching Department examine some theories of learning and learning strategies that will be needed by an elementary school teacher in understanding the character and learning model of elementary school children. Therefore, they will be able to present a learning process in elementary schools to accommodate all ability of the learners. In fact, Primary School Teaching Department students show little attitude of critical thinking in response to a phenomenon. Even if students provide arguments, it has not shown that the arguments submitted are original and logical argument.

Jigsaw cooperative learning model has a characteristic in which there are two kinds of groups, namely the origin and expert groups. The expert group is representatives or delegates from the original group which will discuss the sub certain material, and then the results of discussions at the expert group will be presented in the original group. Thus, each learner will have the responsibility to discuss the matter in depth and convey the results to the discussion or agreement of origin group [7].

Steps of *jigsaw* cooperative learning are as follows:

1. Students are divided into groups of heterogeneous
2. The subject matter is given in the form of text divided into several sub material.
3. Each member of the group read and studies the section that has been assigned. The other group members are studying the same section (delegates) met in expert groups (team of experts) to discuss sub material
4. Each member of the team of experts group (delegates) after discussions, go back to the original group and present their results from experts group to the original group.

With the jigsaw model learning scenario, it would require an individual to have a moral responsibility towards its origin group, because it is a delegation representing the group of origin. Through lesson study program at Primary School Teaching Department, students' critical thinking patterns can be recorded, evaluated and improved so that the students' critical thinking abilities can be upgraded

Critical thinking skills which are observed in this lesson study program are the ability to provide a logical argument, analyzing, and evaluating. Giving a logical argument: students provide feedback (statements / questions) that is in accordance with reason, original, and there are examples in everyday life. Analyzing: decipher, distinguish, identify, select, and organize a phenomenon or problem. Evaluating: Determine, weigh, assess, and criticize a phenomenon or problem based on certain standards.

Based on preliminary analysis, the formulation of the problem in this study is whether the students' critical thinking skills can be enhanced through lectures with the jigsaw model?

2. RESEARCH METHODOLOGY

This research is a classroom action research (CAR) through Lesson Study with qualitative approach with descriptive analysis. The numbers of students involved in Lesson Study are 28 students in a class a class of 2014, consisting of three men and 25 women who took the course teaching and learning. Data retrieval by observation using instruments that have been prepared. Furthermore, the data is analyzed to be described. The following lines of inquiry in the classroom action research used

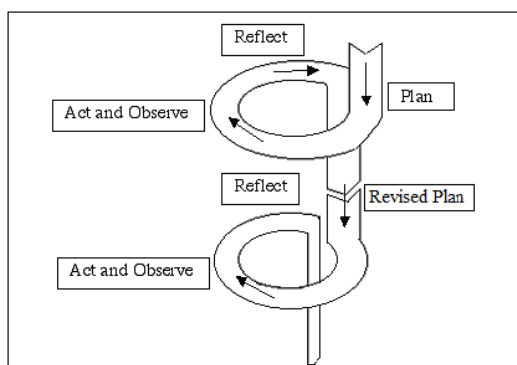


Figure 2.1 Design of CAR by Kemmis and Taggart

Chronology of classroom action research according to Kemmis and Taggart consists of several cycles, each cycle stage consists of activities *Plan* then *Act and Observe* and *Reflect*. Research conducted generally carried out more than one cycle. This research will be conducted three times in a cycle with lecturers of different models, but with the same learning model. The topic of the lecture which is the focus of this of the research is behavioristic learning theory, humanistic and learning strategies. The research data is the result of observation of critical thinking skills using observation instrument that has been developed based on the extent of the students who have identified critical thinking based on answers on a sheet of questions and performance of critical thinking ability of students from each cycle. The data obtained were analyzed inductively and based on the guidelines that had been developed by researchers.

Table 2.1 Categories of Student Critical Thinking Ability

Quantity	Category
81%-100%	Very good
61%-80%	Good
41%-60%	Enough
21%-40%	Insufficient
0%-20%	Very Insufficient

The performance of critical thinking ability of students observed using student observation sheet as follows,

Table 2.2 Observation Sheet of Students Critical Thinking ability

No.	Student activity	Description of Observations		
		cycle 1	cycle 2	cycle 3
1	Provide logical arguments			
2	analyzing			
3	Evaluate			

Operational definition:

1. Give a logical argument: students provide feedback (statements / questions) that is in accordance with reason, original, and there are examples in everyday life
2. Analyze: decipher, distinguish, identify, select, organize a phenomenon or problem

3. Evaluate: Determine, weigh, assess, and criticize a phenomenon or problem based on certain standards.

3. FINDING AND DISCUSSION

The results of studies carried lesson program for 3 cycles aimed to improve students' critical thinking skills in Primary School Teaching Department. In the first cycle of the material, the focus is behavioristic learning theory with a lecturer model Ismail Marzuki, M.Pd. *Plan 1* produced a learning equipments of lesson plan, instructional materials, observation sheets and evaluation sheet. In *Do one* lecture teaches at a glance and serves only material things that should be done by the students. Students were divided into 4 groups of heterogeneous origin. Based on observations made by three observers, the results are as follows,

Table 3.1 Critical Thinking Ability of Primary School Teaching Students

No.	Student activity	Result	
		Quantities (on the answer sheet)	Performance / discussion
1	Provide logical arguments	21%	7%
2	analyzing	11%	11%
3	Evaluate	11%	11%

From the observation in cycle 1 can be concluded that in cycle 1 students' ability to provide logical arguments in the category very insufficient because only 21% of students are on logical arguments on the answer sheet. Arguments presented tend to refer to one of teaching materials that are used and not the original argument from the student. Students' performance in giving argument is very insufficient since the appointment of students by lecturers to provide argument or response is required. However, there are 11% of students or three students who ultimately submit arguments due to the appointment of lecturers. On the ability to analyze, there are three similar patterns of responses among fellow students. It shows the students cooperate for solving the given problem. *See Phase* discuss the advantages and disadvantages of the *Do 1*. As an evaluation is a preparation for the second cycle to make it better, especially for anticipation or alternative, namely with regard to facilities and supporting infrastructure to support lectures and lecture scenarios that support aspects of the research which is undertaken.

In the second cycle focusing matter is the humanistic learning theory with lecturer model Afakhrul Massub Bakhtiar, M.Pd. *Plan 2* generates a learning equipment of lesson plan, teaching materials, observation Sheets and Evaluation Sheet. *The process of Do 2 presented the material at a glance and the things that should be done by the students.* Students were divided into 4 groups of origin are heterogeneous and different from the group formed in the first cycle. Based on observations made by three observers, the results are as follows,

Table 3.2 Critical Thinking Ability of Primary School Teaching

No.	Student activity	Result	
		Quantity	Performance / discussion
1	Provide logical arguments	29%	14%
2	analyzing	18%	11%
3	Evaluate	11%	11%

From the observation in cycle 2 can be concluded that the second cycle students' critical thinking ability has improved. The amount of students that provide a logical argument has been increased from the first cycle, but still in the poor category because only 29% of students who leave a response or logical argument on the answer sheet. Arguments presented tend to refer to one of teaching materials used, too theoretical and not an original argument students and less reflective of the closeness to reality in everyday

life.. Students' performance in delivering arguments have also increased, although still in the category of very poor because there are only four students who demonstrate the performance of critical thinking (expressed logical argument) without the need for the appointment of lecturers in delivering argument or response. On the ability to analyze and evaluate, there are 5 that is almost similar pattern of responses among fellow students. It could be considered that there are five students who have answered questions in the original initiative and logically, even though the student remains engaged in working on the given problem. *See Phase discuss the advantages and disadvantages Do 2.* Students' performance in the delivery of analysis and evaluation is also increased when compared with the performance in the first cycle although still in the category of very poor because there are only three students who have initiative to give communication of feedback in the form of analysis and evaluation.

In the third cycle of the material focus is learning strategies with lecturer model Nataria Wahyuning Subayani, M.Pd. *Plan 3* generated learning equipment of, observation sheets and evaluation sheet. *Do 3* {presented the material at a glance and the things that should be done by the students. Students were divided into 4 groups of origin are heterogeneous and different from the group formed in cycle 2. Based on observations made by three observers, the results are as follows,

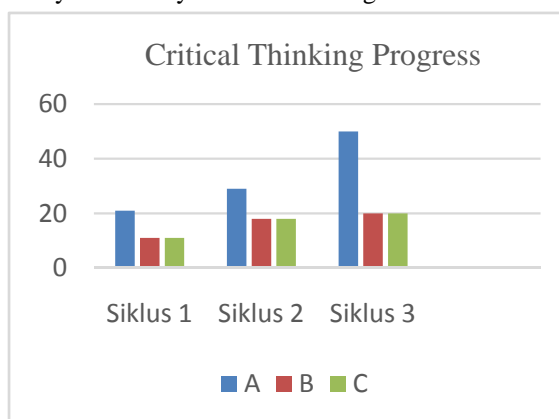
Table 3.3 Critical Thinking Ability Primary School Teaching students

No.	Student activity	Result	
		Quantity	Performance / discussion
1	Provide logical arguments	50%	18%
2	analyzing	20%	14%
3	Evaluate	20%	14%

From the observation in cycle 3 it can be concluded that the third cycle of students' ability to provide logical arguments have shown an increase in the category enough for 50% of the students provide answers or logical argument on the answer sheet. The tendency to refer first teaching materials have been reduced and have used the original argument with the language itself in answering questions and adapted to everyday life. Student performance in delivering arguments have shown improvement from the second cycle, although still in the category of very insufficient 18% of the students showing the performance of critical thinking (expressed logical argument) without the need for the appointment of lecturers in delivering argument or response. On the ability to analyze, there are 6 answers almost similar pattern among fellow students. Fourteen percent of students have performed in the process of delivering lectures argument (analysis and evaluation) without appointment from lecturer. *See Phase discuss the advantages and disadvantages Do 3.*

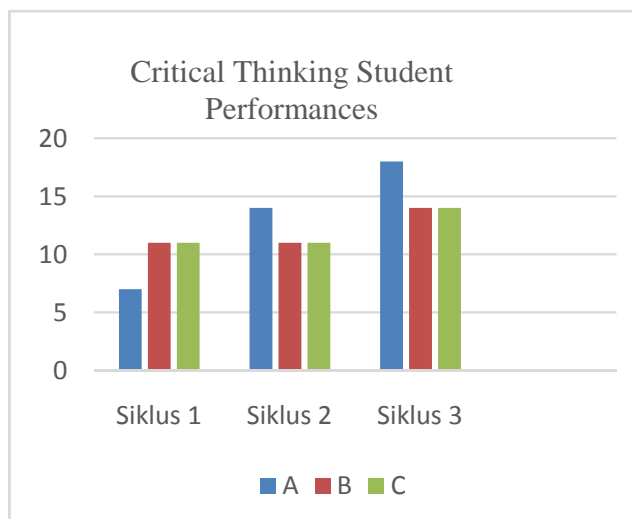
Results of the study through Lesson Study consisting of three cycles, is shown in the chart below;

Figure 3.1 Quantity of Primary School Teaching Students' Critical Thinking



While the improvement the performance of students in critical thinking displayed as in the following diagram;

Chart 3.2 Critical Thinking Student Performances



Based on research, there are things that affect the results. They are:

1. Input of academic backgrounds of students from SMA / MA / SMK diverse and the average is students eliminated from prominent universities.
2. Students have low confidence during lectures take place, it is reflected in the attitude of students when there is an offer from lecturers to express their ideas / arguments / response to a statement / question / phenomena and problems that are shown with an expression showing they will express an idea, but it is not delivered, whispering to respond to the stimulus of lecturers, students refer to each other to convey the argument / response questions / statements / phenomenon / problem set by the lecturer. As well as the required offers even eventually lecturer appoint one or several students to submit argument or response to a statement and phenomenon which are presented. Besides that lecturers should provide stimulus in the form of value if there are students who provide argument or response.
3. The tendency to use teaching materials is limited (only recommendation lecturer). Students do not use any other alternative teaching materials. This is because students are less challenged by other teaching materials, having orientation towards high score in the lecture.
4. The average student does not respond immediately if there are things that the students do not understand toward a concept. Although lecturers have offered the opportunity to ask for things that are not yet understood, but in general, the students said that they have understood the concepts.

4. CONCLUSION

Based on observations from the third cycle of the implementation of lesson study in the subject of teaching and learning in Primary School Teacher department, the study concluded that the lesson program through a jigsaw-type learning model can improve students' critical thinking skills in terms of providing logical arguments, analyzing and evaluating. Providing logical arguments mean students provide feedback (statements / questions) that is in accordance with reason, original, and there are examples in everyday life, analyzing is to describe, distinguish, identify, select, organize a phenomenon or problem and evaluating means decisive, weigh, judging, criticizing a phenomenon or problem based on certain standards. It can be described that based on research, the amount of students who give a verbal response (the performance of critical thinking) about the phenomenon or problem set by lecturers increased from cycle to cycle; the frequency of students who leave comments or questions increase from cycle to cycle;

arguments given from cycle to cycle show improvement towards more logical ones; the analytical skills of students on the problems posed indicate an increased level of sharpness; and increasing the ability of student evaluations to provide alternative solutions.

Improvement of critical thinking skills is achieved because of the scenario in jigsaw learning model accommodates and require that every individual has equal opportunity to present the results of the discussion of the expert group to the original group. Therefore, it is recommended to use jigsaw model in lectures on other subjects, so that the critical thinking skills that have been studied could achieve maximum results and other critical thinking skills can be developed.

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**THE INCREASE IN BASIC SKILL OF INSTRUCTIONAL TECHNIQUE (*PEKERTI* - *Pelatihan Keterampilan Dasar Teknik Instruksional*)
BASED ON LESSON STUDY**

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Abstract: The attempt of enhancing pedagogical competence of University of Malang (UM) lecturers needs to be conducted incessantly, so that instruction quality can be running well. This article aims to try describing guidance model of University of Malang (UM) young lectures through *Pekerti* based on *Lesson Study*. This research uses qualitative approach by the young lectures of University of Malang (UM) as its research subject that has pure educational background, and lectures that have interest to enhance their pedagogical competence. From the research result, the points can be concluded are: 1) guidance model implemented by University of Malang, it is *pekerti* conducted by three steps, they are: enhancing knowledge program, developing instructional equipment program, and implementation and reflection program. 2) *Pekerti* based on *lesson study* can improve practical instructional of lecturing activity. Impression gained during committing lesson study are: planning conducted collectively can be prime capital to implement more effective instruction because of lot of aspiration, advice, and suggestion from various parties; lecturing is not only transmitting knowledge from a lecturer to students; inserted joke used by lecturer is very effective for enhancing student's learning motivation.

Keyword: *Pekerti* and *Lesson Study*.

1. INTRODUCTION

The recent educational life gains acute attention related to demand to result good quality of human resource. It means human resource that can survive in the 21st. It means people that are capable, that have competence needed in life, especially for entering job environment in the 21st century. Demand is directed to educational life, is caused by unusual development in the knowledge, especially on educational psychology and educational technology field.

University of Malang (UM) as LPTK must create and result good quality of human resource that can compete in the national and international standard of education. Alumnus has to be master of soft and hard skill, so that they can compete for gaining job in the local, national, and global scope. For resulting good alumnus, good input and efficient process and good of quality is needed. One of elements of supporting process is lecturer as the prime executor of *Tri dharma* of university. Quality of committing education and instruction has to be improved, in order to it has not been left behind by technological and knowledge advancement.

Lecturer, is committing instruction needs adequate academical, and pedagogical mastery, beside the other ability support. Adapting lecturing material, in a row with science and technological development is absolutely needed, so that lecturing material is not out of date. While pedagogical competence also must be improved because of instructional paradigm is used at the recent time. So, upgrading and enhancing their competence become an obligation for lecturers. Beside, rapid technological and informational development must be accommodated by lectures, either for science developing, or quality of pedagogy. This circumstance shows that enhancing quality of committing instructional in the class needs improving professional and academical competence sustainably.

Problems of professional and pedagogical competence are faced by lecturers of University of Malang (UM) are: 1) there are many lectures that implement behaviour instructional paradigm, in which lecturing is centred by lecturer. Paradigm of behaviouristic is evidently has influenced lecturer's attitude and behaviour, whoever and whenever the educational activity is committed. Mostly, instructional activity conducted is more authoritative, and less give opportunity for students to participation (Sanusi 2010). In other word, instructional model in an educational institution in Indonesia is committed through

paradigm of behaviouristic at the recent time, or Freire mentions it as educational model based on banking model. It is called as banking model because of there is no comprehending process to students, but carrying evidences or formula to students for storing, and then implementing by similar form if needed. Banking model education creates contradiction through manners and habits reflect to oppressed society totally. (Freire, 1985). Whereas, in the recent education and instruction, individual who occupies the prime position, is party that determines instructional activity happens or does not happen within their self; (2) Just little part of lecturer who accommodates technology, information, and communication in the conducting instructional activity. 3) Less soft skill linked to hard skill instruction in the class. In addition, the harmony between program of scientific and educational study, University of Malang has various lecturer by scientific educational program, so pedagogical competence still need to be improved. This improving is aimed to manifest well instruction and the lecturers are able to develop good instruction.

Therefore, University of Malang's lecturers, especially young lecturers that have educational background are absolutely need to enhance their instructional competence. The attempt of enhancing pedagogical competence needs to be conducted continually, in order to instruction quality is running well. Well instructional process is expected can improve quality of alumnus in order to be able to "survive" and compete in the 21st century.

2. RESEARCH METHODOLOGY

This research is conducted by qualitative approach, in which this research attempts to emphasize reality characteristic constructed socially, that has close relation between researcher and researched subject (Denzin and Lincoln, 2009). Subject in this research is the young lecturer of University of Malang that has scientific background (pure) and lectures have interesting to upgrade and develop their pedagogical competence. All background of research subject is 37 from all faculty. While collecting data of this research is conducted by observation method to *Pekerti* implementation based on lesson study, where from 37 of people are divided into the large group

3. FINDING AND DISCUSSION

Guidance Model of University of Malang (UM)'s Young Lecturer

LPTK as one educational institution has basic function for preparing human resource that has good quality, because LPTK is educational institution that creates the young scientist, candidate of instructor becoming strategic national asset for organizing sustainability of educational development. University of Malang (UM) as LPTK must be able to create good alumnus, that can compete in high level as national and international standard of education. University of Malang (UM) alumnus must be master of various competence in order to they can compete for gaining job in local, national, global level. One of supporting factors that helps this objective is good quality of lecturer as the prime executor of *Tri Dharma Perguruan Tinggi*.

Quality of lecturer is the most influential factor for students learning success, because this factor is able to manipulate the other factors becoming more useful. A lecturer becomes a leader in instruction process in the class, so that instructional success in the class is extremely based on lecturer's competence. Therefore, it has to be evaluated, enhanced for gaining standard of quality determined (Copriady, 2013). Insufficient quality of lecturer in the instructional practice would give negative psychological impact for student learning circumstance. This condition, of course, would determine quality of instruction. (Orlich *et al.*1998). Thus, measuring and improving lecturer quality becomes important aspect. (Suratno & Yulianti, 2011).

Educational experts stated various argument about developing program of lecturing profession. According to J.G. Gaff and Doughty, as cited by Miarso (2009), there are three attempts that have close relationship to each other, they are *instructional development* = ID, *organizational development* = OD), and *professional development* = PD. Bergquist and Philips argued that developing lecturer is the main part of institutional development, it involves part of developing personnel, professional developing, organizational developing, and societal developing.

By standing on this argument, University of Malang (UM) attempts to enhance pedagogical competence of lecturers, especially the young lecturers that has non-educational background in order to instruction activity can be running well. Basically, pedagogical competence or organising instructional activity competence is the most influential factor of success of educational process. Pedagogical competence is related to good teaching manner, in order to instructional process can be committed well, effectively, and efficiently. A lecturer, except must be master of his or her discipline, he or she also must be master of instructional techniques and theories and how to implement them in the university. Therefore, improving competence on this field is prominent aspect of developing lecturer professionalism.

Some universities in U.S. assess faculty quality through lecturer competence in the organizing process of lecturing. Likewise, course given to students is also adapted to pedagogical competence of lecturers. Lecturers are not only assessed from their mastery of their study or their developing scientific theories, but also from their teaching competence in the class that involves instructional approach, strategy, method, and art.

While guidance model of lecturer determined by University of Malang (UM) to enhance instructional competence through *Pelatihan Ketrampilan Dasar Teknik Instruksional (Pekerti)* program. Operationally, *Pekerti* UM is conducted by three stages, they are:

1. Enhancing knowledge activity

This activity, basically, aims to enhance knowledge or theoretical understanding of lecturers as participant of *Pekerti* in order to competence for developing innovative instructional is increased. This activity is conducted by *workshop* model, related to understanding policy, theoretical concept, technical problem of curriculum.

2. Developing instructional equipment activity

Developing instructional equipment aims to improve lecturer skill, such as developing syllabus, SAP, RPS completely and operationally until it can be implemented in the lecturing process.

3. Implementation and reflection activity

Equipment that has been developed must be able to be implemented by lecturers as participant of *Pekerti* based on *Lesson Study*. Lewis (2002) stated that *Lesson study* can provide opportunity for instructor to develop instructional knowledge. *Lesson study* implementation can improve instructional practice (Stigler & Hiebert, 1999). Even Demir *et al.* (2012) asserted that *lesson study* is able to encourage change of instructional practice pedagogically in the university.

Developing model of UM's young lecturer profession, as has been mentioned, is impartial from general developing program of university. Because success of that program is influential to quality of university itself. Hence, those programs are needed to be implemented continually and sustainably, so that good quality of lecturer can be created that would encourage university advancement.

By seriousness of university for enhancing lecturer professionalism, professional lecturers are hopefully resulted, that can take their duties professionally, creating scientist and skilled employee on various field, creating intellectuality for national life in widest area, and developing Indonesian human personalities. Thus, we hope university is able to bear leaders and national generation bringing Indonesia becomes progressive and valuable nation.

Pekerti Based on Lesson Study

Pekerti based on *lesson study* as guidance model for enhancing lecturer's understanding instructional concept, principle, and model covered within *workshop* form and training. While reason of selecting *Lessons study* (LS) as basis of *Pekerti* activity is that *LS* provides various easiness for lecturer within planning instruction and executing *LS* stage is simply, easy conducting. Suratno (2009) stated that *Lesson study* implementation is convinced can improve basic understanding in the instruction, enhancing instructor professionalism, and creating learning community. It is the same as Copriady statement (2013), he said that instructional process through *Lesson study* implementation that can be used as developing instructor professionalism program.

Lesson study within *Pekerti* activity is conducted by three stages, they are: planning, executing, and reflection. Planning stage involves instructional planning and preparing instructional equipment. This stages aims to result instructional outline convinced for instructing students effectively and arousing student participation in the instructional activity consists of instructional equipment such as RPS outfitted by instructional media, LKM, evaluation instrument, observation sheet or observing learning activity. Planning is conducted collaboratively by lecturers as participant of *Pekerti* in collaboration with various idea completing existed instructional outline. In this stage, planning is conducted on 28th July 2016 and formulating instructional planning for Introduction of History course by Historical Consciousness as its topic.

In planning process, there is finding that planning activity creates collegial dialectical space, in which each lecturer can agree a collective agreement although each lecturer has different perception. In this activity, lecturers actively participate in the instructional activity, formulating concept, idea or argument for designing effective instruction in the class. According to Hendayana (2007), collaboration principle would facilitate instructors for creating effective and efficient learning community. Instructors have learning culture collaboratively will be a professional instructor that can help enhancing instructional quality. According to Goodsaon & Hargreaves in Saito, Cs (2015:25), dialogue activity among instructors is created collegial collaboration. Of course, this collegial collaboration will be better if dialogue exists engaging educational experts.

The next stage of LS is conducting instruction and observing by colleagues (*do*). This stage aims to implement instructional outline planned in the previous stage. In the early activity, model lecturer gives explanation by attempting to understand how depth student understanding about topic that will be discussed. There are some methods for understanding it. In the first method, model lecturer opens by basic questions related to instructional concept. The second method, model lecturer attempts to understand how depth students' understanding by stimulating students to explain a keyword from observing result *meme* "*belajar sejarah tidak bisa move on*."

In this process, model lecturer tries to understand students understanding, whether students can understand or not, it is not about whether students can memorize or not. Model lecturer, in this process also, encourages students to think by their competence for simplifying a discussion in a keyword. Data resulted in this learning process in the class is that, sometimes students have not understand a complex problem and then simplify it yet in a word. It is caused by memorizing method without understanding is still strong accustomed. Habitually, before they continue their study in the university, they are more familiar with memorizing method. It makes them feel difficult to understand a text. Finally, it makes them difficult to think autonomously.

After completing the early activity, the next stage is the prime activity. In this stage, model lecturer conducts instructional process. The steps that must be implemented in this stage have to be suitable with instructional steps that have been agreed collectively.

In this activity, model lecturer asks students to read *hand-out* related to the topic for five minutes. Then, students are asked to put the chairs in order circularly, in which there is small circle occupied by six people, and its residue is the large circle. This activity consists of students' discussion, and their response to lecturer's statement. Ordering the chair circularly aims to create variety of pleasing learning. According to Winataputra (2003:9), ordering appropriate class environment is influential for students' participation level in the instructional process. Circular ordering chair will facilitate students to interact directly to their colleague, and abridge them to discuss full collectively.

In the last part of prime activity (*do*), lecturer with students collaboratively try to conclude topic in the instructional activity. This stage aims to students have also experienced process of thought, and then manifest it by action in their life.

For the last stage of LS is the reflection (*see*) which includes collegial review. This stage is intended to discover the advantages and disadvantages of learning implementation. Participants of *Pekerti* who served as model lecturer, starts the discussions with present the results of reflections and impressions about learning implementation. Then, the next opportunity given to observer interchangeably to convey

what has been gained from new learning that has gone on. Criticisms and suggestions are communicated wisely without disparage the instructor who teaches because everything is for improvement practice in the future. From all entry can be redesigned in the next learning to create better learning activity.

Based on the results of the LS activity that has been done, there are some messages and impressions from participants of LS. The impression gained from LS implementation i.e model lecturer is extremely helped in the instructing activity by LS team. This is certainly not surprising, remembering a good instructing can not only be made by itself. Someone needs to get help from others to create effective learning. In line with this Sato, Masaaki (2006) and Sato, Manabu (2006) said that collaborative strategies are designed, so there is no learner who cannot achieve the learning objectives. Through this effort, students failure can be reduced. Planning conducted collaboratively can be the primary capital to achieve more effective learning because of its aspirations, suggestions, and input from various parties.

Another impression obtained, show that learning is not just a knowledge transmitting from lecturer to students. Giving instant material is not effective because it makes students do not learn. Providing materials completely and instantly will not challenge students to think critically and learning obtained by students tends to be meaningless. Syamsuri and Ibrahim (2008) asserted that obligation as an instructor is not only the *transfer of knowledge*, but also changing behaviour and providing positive encouragement, so learners are motivated to enjoy a pleasing learning environment to make their ability grows up.

LS Participants, in this case, acts as a student who gives the impression, if the material about history taught by model lecturer makes students become very enthusiastic to pay attention. Many students said "This is the first time I am learning history which is not boring". This is certainly not surprising because when model lecturer conveys the material, there are insertion humour used in the sidelines of the learning. Cooper and Sawaf in Darmansyah (2011: 77) stated that humour of an instructor encourages students to be always cheerful and happy and not quickly get bored or tired. This condition will greatly affect the students' grasp of the learning material that will positively affect study result. Humour is considered the best, because it is easily inserted in various situations, and of course it is suitable to all age of students. Humour is able to facilitate a person to express words that are not easily to say. Darmansyah (2011) argues that there are four benefits of humour in the learning activity, they are:

1. Building relationship and improving communication
2. Reducing stress
3. Making learning more interesting
4. Improving memory of subject matter

4. CONCLUSION

University of Malang (UM)'s lecturer especially the young lecturers who have non educational background, are obliged to improve their instructional capabilities. The attempts for enhancing pedagogical competence of UM's lecturers needs to be conducted sustainably in order to instructional quality can be running well. Conducting good instruction is expected can improve UM's alumnum that can compete and survive in the 21st century. Guidance model for lecturer determined by by UM is *Pelatihan Ketrampilan Dasar Teknik Instruksional (Pekerti)* conducted within three stages, they are: enhancing knowledge, enhancing instructional equipment, and implementation and reflection activity. *Pekerti* activity based on *lesson study* that has been held, can enhance instructional practice of UM's lecturers. From this activity, there are many impressions gained, they are: planning conducted collaboratively becomes a primary model to manifest effective instruction, because of there are many aspirations, advices, and suggestions from various party; instructional activity is not about merely transfer of knowledge from lecturer to students; and inserted humour used by lecturer is extremely effective for enhancing students' learning motivation.

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Learning Innovation: Virtual Campaign for Facilitating the Improvement of Students' cognitive and Scientific Process Skill in Term of ADAM

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Abstract: A study has been conducted to explore the effect of virtual campaign on cognitive and scientific process skills. The study was in line with the government's program for Anti-Drugs Abuse Movement (ADAM), since the drugs abusers have been increasing recently in Indonesia. The improvement of cognitive and scientific process skills was qualitatively described respectively using the data obtained from cognitive test and observation sheet. The cognitive test and observation sheet were administered to 57 undergraduate students of Science Education Program of State University of Malang who attended Drugs: Benefit and Abuse class. The result of the study shows that students have 25,82% higher cognitive skill and 1,17% higher scientific process skill than before the treatment. The researchers conclude that the virtual campaign is an effective method for facilitating the improvement of the students' cognitive and scientific process skill, as well as a good method for Anti Drug Abuse Movement.

Keywords: virtual campaign, cognitive skill, scientific process skill, ADAM

1. INTRODUCTION

Indonesia is one of the world's archipelagic states with population reaching 258 million people in 2016 spread from Sabang to Merauke. The huge variety of plantation has also been utilized by the people in Indonesia from the time of their ancestors. Among that variety, some plants can be used as medicine. Based on rule 35 of the 2009 constitution, narcotics can either be natural or synthetic medicinal substance that can become harmful and addicting if used abusively and without a proper supervision. Narcotics that are consumed excessively above the prescribed dosage can cause a strong psychological addiction to keep using the substance again and again.

Narcotics abuse have been a concern in countries around the world due to its rapid increase each year from the 20th century including Indonesia who declared emergency on narcotics. Since 2007, an NGO by the name of GANNAS (Gerakan Anti Narkotika Nasional) or National Anti-drug Movement, has been actively promote various efforts to fight narcotics abuse (Insani, dkk, 2015). Based on the survey conducted by BNN (Badan Narkotika Nasional) or National Narcotics Institution, narcotics distribution has become a pressing concern, in which abusers have become addicts while they are still under educational institutions. These concerns require serious treatments.

Indonesian government, especially the ministry of basic education has established that national education curriculum for middle school science class includes competence that covers addictive substances. This move is one of the preventive measures against drug abuse in Indonesia. Middle schoolers are generally in between 11-17 years old, which are characterized to be able to think abstractly and logically. Emotional development characteristics shows tendency of ambivalence (likes to go on alone or socialize, and desire to be free of parents' dominance), skeptical, and unstable emotional state (Budi, 2011).

One of the learning outcome for science education FMIPA UM study program is competence as science middle school educator. Science education FMIPA UM study program's curriculum is also consistent with the competence required for the national educational curriculum. Narkotika, Bahan Terlarang, dan Psikotropika (Narcotics, Controlled Substance, and Psychotropic) is one of the compulsory courses for all students under science education study program. These students that will be projected as educators must have a higher capability to understand knowledge compared to their students. They must

possess the cognitive aspect that allows them to transfer their knowledge to students. Science process skills are also mandatory.

The aim for science process skills is to develop physical and mental capabilities as base for further develop higher skills for the students. The interactions between capabilities and concept through learning process will further develop the attitude and values of students, such as creativity, criticism, attention to details, and problem solving (Hamalik, 2003). An educator is highly required to develop their creativity to answer challenges of their own competence. One of the outputs of Narkotika, Bahan Terlarang, dan Psikotropika course is to create awareness and involvement in narcotic abuse cases, thus campaign activities are required to be done. Based on prior studies by Insani, dkk (2015), the learning mediums can be used as innovations for preemptive and preventive campaign as well as tools to facilitate competence understanding and mastery, and to enrich the student's knowledge from cognitive, affective dimension and science process skill.

The research development performed in this study is to make use of information and telecommunication technological advancements. The increasingly improved internet-based information and telecommunication technology allows positive opportunity to spread knowledge and information. The creation of virtual campaign medium provided by internet information system will allow easier dissemination of information throughout Indonesia, even international. The growth of social media is also one of the participants to provide the medium for this dissemination of information. The communication device (cell phone) operating system is also undergoing rapid improvement which further allow easier access to information, in which anti-narcotic abuse campaign can be performed even more effectively and efficient.

2. RESEARCH METHODOLOGY

This research is a research action analyzed qualitatively descriptive. The research subjects are 57 students from Science Education FMIPA UM study program who are taking Narkotika, Bahan Terlarang, and Psikotropika course.

Project-based learning model is used within two cycles to synthesize video. The first cycle is a video planning phase, the second cycle is video dissemination phase and result report for the video. In the first cycle, students are required to make storyboard and schedule planning, in which they would have to present it in the class. For the second cycle, students are to create campaign media in the form of a video, for which they upload to YouTube social media. The result for their campaign is to be reported in the class.

The results for the first and the second cycles are compared by cognitive aspect and science process skill. The cognitive aspect is obtained through test, while the science process skill is obtained through observation sheet. Grades are then analyzed and described.

3. FINDING AND DISCUSSION

a. Cognitive Aspect

The project-based learning method application on anti-NAPZA abuse campaign increased the cognitive competence of students in science education FMIPA study program Universitas Negeri Malang (State University of Malang). Table 1 shows student's average cognitive learning result on each research phase, which is the application of project-based learning with anti-NAPZA abuse campaign through YouTube. The average result for student's cognitive learning in Cycle 1 increased by 1,84 compared to the average pre-action; Cycle 2 experienced an increase by 23,56 from the first cycle average result.

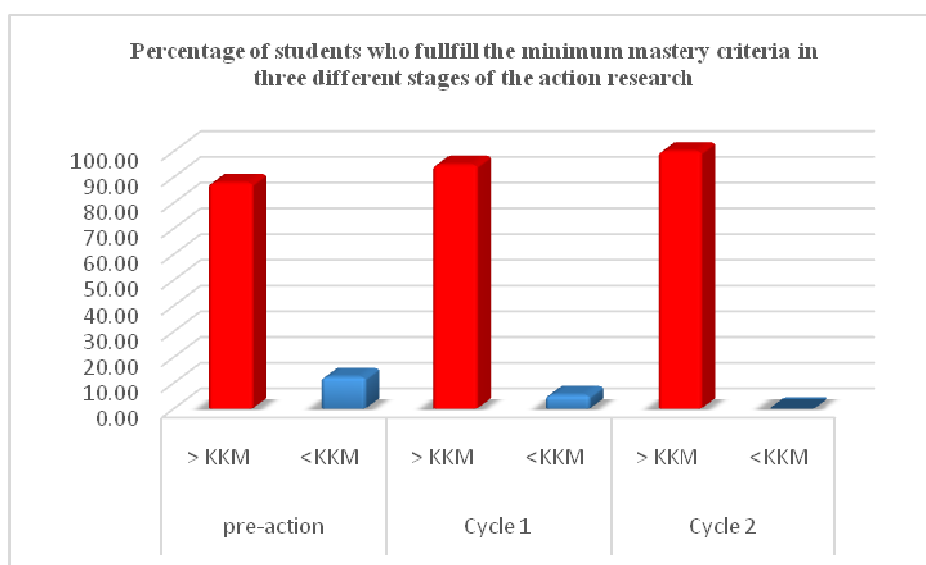
Table 1. Average Result of Student’s Cognitive Learning

Research Phase	Cognitive Learning Average Result
Pre-action	65,77
Cycle 1	66,98
Cycle 2	82,75

The amount of students that have and have not reached the minimum mastery criteria (KKM) in each phase are shown in Table 2. The percentage of students that have and have not reached KKM in each phase is shown in Picture 1. The diagram in Picture 1 shows a decline in percentage of student who have not reached minimum mastery criteria. The percentage of students who have not reached KKM consecutively 12,28% in pre-action, 5,26% in cycle 1, and 0,00% in cycle 2. The percentage of students who have completed KKM consecutively 87,72% in pre-action, 94,74% in cycle 1, and 100% in cycle 2.

Table 2. Students who have and have not reached KKM in each Research Phase

Research Phase	Students who reached KKM	Students who have not reached KKM
Pre-action	50	7
Cycle 1	54	3
Cycle 2	57	0



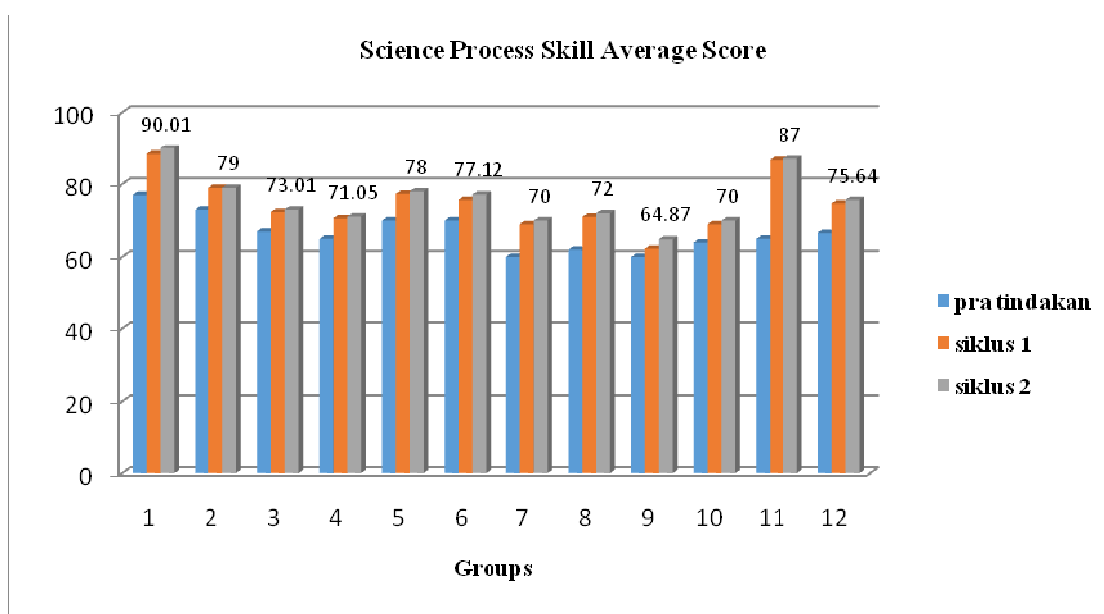
Picture 1. The percentage of students with cognitive grade above and below minimum mastery criteria in pre-action, cycle 1, and cycle 2

There have been an increase in average percentage of cognitive learning result in cycle 1, but it is still below the appointed classical mastery criteria, which is 75. This is due to cycle 1 to be an early phase of learning application using anti-NAPZA abuse campaign project method through YouTube. In cycle 1, students have only started doing initial exploration to create project campaign storyboard, thus anti-NAPZA videos have not been completed yet. There have been a significant increase in learning result within cycle 2, and the average of cognitive learning result reached 83,75 which comply with the classical mastery criteria. This result is caused by the completion of project-based learning application in cycle 2 starting from preparing the concept idea, anti-NAPZA abuse video creation, posting the video in YouTube social media, creating reports of comments/like/dislike progression, and lastly presenting the

campaign reports. Their involvement had not been restricted only as minds on activities, but also hands on activities as they had conducted literature studies to create relevant contents that are used in the anti-NAPZA abuse videos; further, as they produced the anti-drug abuse, the activity involved hands on activities.

b. Science Process Skill Aspect

Science process skill aspect (KPS) observed are: 1) work method planning; 2) work method execution; and 3) communication. Work method planning aspect is focused on student's activity during decision making of product to be planned and type of application to be performed. Work method execution aspect is focused on student's activity to acquire population and demonstrate the information holistically. The communication aspect is focused on the campaign activity using the completed product. These three aspects are continuously observed within 11 student groups beginning from the pre-action, cycle 1, and cycle 2. The data summary of student's science process skill is shown in Picture 2 below.



Picture 2. Science Process Skill Average Score

Based on the research result, the student's science process skill is showing a very good increment. The average pre-action average KPS is 66,64. This score shows that student's competence toward multimedia mastery criteria is still deficient. Therefore, planned within cycle 1, KPS is manifested as structured assignment in the form of papers. The scoring result shows that the average KPS started to increase to 74,66. The reflexion within cycle 1 stated that the students are capable of working well together during assignment planning, execution, and even during the classical presentation. In accordance, Yuniastuti (2013) stated that a learning activity based on processing skill principal would educate students to discover and develop their own fact and concept. Processing skill would develop very well if students are given chance to practice using their own thinking skills, so that they would be able to study science in compatible with their own potential (Semawan, dkk., 1992).

During cycle 2, learning process using virtual media as the application of structured assignment previously initiated in cycle 1 is planned. The learning strategy decision done by the lecturer to their students highly affects the success of reaching the lectures goals (Mulyani, 2000). Therefore, the decision of assignments in the form of virtual media is expected to polish the student's science processing skill.

The observation shows that during the work method planning activity, students are seen to be actively involved in a discussion among their group members as well as consult the lecturer. During the

execution aspect, students show that they are skilled enough to use the multimedia in the form of video and able to delegate all group members to actively take part in the video. The last KPS aspect is communication. The viewer's response regarding anti-drug campaign can be seen in YouTube social media. By the end of cycle 2, the average KPS score increased to 75,64. This number shows that the KPS of students in science education study program regarding the mastery of virtual media has reached good criteria. The increase of science processing skill obtained during this research is due to NAPZA course study given using study method which gives opportunity for students to actively involved and explore multiple skills and supported technological resources.

Lecturer interview answers

1. Lecturer 1
 - a. I have never watched any virtual study videos before. Generally, only videos shown in classes.
 - b. Important information regarding drug abuse effects on health and social
 - c. Yes
 - d. The campaign activity needs more concrete actions, directly interact with people in the streets if possible to further expand the benefits
 - e. Drugs need to be eradicated
2. Lecturer 2
 - a. I have, just once by integrating it with blended learning.
 - b. Drugs are easily abused by students. Their lifestyle that tends to be boundless, easy access, and limited knowledge are causing students to easily fall victim to drugs. Thus socialization on the negative effect and risks on drugs needs to be done.
 - c. Yes, it's interesting.
 - d. The learning method using virtual media can give new experiences and gives benefit to students.
 - e. The responsibility for drug related cases within campus area, is not only just lecturer's responsibility, but also all elements in the campus as well as the community to work together, with strong commitment to fight drug abuse and distribution.

Citizen interview answers

1. Citizen 1
 - a. I have never seen any drugs-related videos
 - b. It contains information on drugs
 - c. Yes, video is really needed as it's very informative
 - d. The next step should be to have a direct campaign in the streets
 - e. Message: No to drugs, Yes to achievement
2. Citizen 2
 - a. Never seen the video
 - b. It contains information on what drugs really are, the danger, and how to live healthy without drugs
 - c. Yes, it needs the video because it's very interesting
 - d. The next move should be to have people in the field to campaign
 - e. Message: Say NO to drugs

4. CONCLUSION

Based on the result of this research, the virtual campaign is an effective method for facilitating the improvement of the students' cognitive and scientific process skill, as well as a good method for Anti Drug Abuse Movement.

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IMPROVEMENT OF STUDENTS' ABILITY IN THEOREM EVIDENCE BY JIGSAW IN COOPERATIVE LEARNING MODEL

(Lesson Study on Real Analysis Subject for 5th Semester of University of Muhammadiyah Gresik)

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Abstract: As educators candidate, students Mathematics Education provided with professional competence. Professional competence expertise provided through courses, one of which is the subject of Real Analysis. Real Analysis 1 begins with the concept, the definition of the concept, nature, proving the theorem and lemma concluded with a discussion of proof problems. The proof of theorem and lemma and the problems in the form of it is being the students' reason that this course is the most difficult subjects. English reference is also a reason for the difficulty of students to understand the material. To overcome some of the teaching methods had been tried, including a lecture and presentation. But by using that method is still not able to improve students' ability in proving theorems.

Based on these problems, the team of Lesson Study (LS) tried to apply learning with cooperative learning model on jigsaw type. Jigsaw type of cooperative learning is a type of cooperative learning that consists of several members in a group who responsible for control of parts of the study material and they able to teach the material to the other members in the group. LS activities carried out by 4 cycles and every cycle there are three phases, there are plan, do and see. 'Plan' activities carried out with the team with the aim to develop a learning device that includes syllabus, SAP, LKM, media and modules. 'Do' activity is the implementation of learning tools into the learning process conducted by a teaching models. Meanwhile, the other team members who are not as performing lecturer do the observation. After the study is completed, the team conducted a reflection of learning called 'see'.

Based on the data analysis on the results of observations of cycle 1 to 4 increased the ability of students in the proof of the theorem, though the 3rd cycle decline. It can be concluded that the jigsaw cooperative learning model can improve students' ability in proving theorems.

Keywords: *cooperative, jigsaw, lesson study*

1. INTRODUCTION

Real Analysis courses are courses included in clumps analysis. Although the material in this course is not taught in school of mathematics, but as a prospective educators, students are expected to master the Mathematics Education department. These materials support them for mathematics knowledge in school. Similarly, for graduates who wish to further study, it is expected that they can master it well.

In terms of content, this course differs from other courses. Real Analysis 1 begins with the concept, the definition of the concept, nature, proving the theorem and lemma concluded with a discussion of the problems of proof. Proof of theorem and lemma and the problems in the form of proof is the reason of the students that this course is the most difficult subjects. To understand the definitions are still many students who need it, especially in the proof of the theorem. The difficulties in proving the theorem is due to students do not understand the definition and they are not accustomed to solve the problems of proof. Thus the students thought that the course is a real analysis of subjects that are difficult to study because the material is in the form of proof of the theorem. Reference in English language is also a reason for the difficulty of students to understand the material. To overcome those problems some of the teaching methods had been tried, including a lecture and presentation. Lecture method is the explaining the material from the name of the concept, definition followed by illustrations, examples of the concepts, and examples proving theorems. Each meeting ended with discussion questions. But with that method is still not able to improve students' ability in proving theorems. Of the 32 students only 5 students were able to prove the theorem by using the definition. In addition, of 32 students, only 10 students who graduated in score C and BC. Such learning process is still centered on faculty and students tend to be

passive. Only a few students who would like to ask when their lecturer gives the opportunity to ask, so if lecturers give questions at the end of the explanation. Thus the purpose of learning is not reached, the hope that the students can think critically is not completed through this course.

The problems of this research activity based on LS is "Does the jigsaw cooperative learning model can improve students' ability to prove theorems?"

Jigsaw was first developed and tested by Elliot Aronson and friends at the University of Texas, and adapted by Slavin and friends at Johns Hopkins University (Arends, 2001). Jigsaw teaching techniques developed by Aronson et. al. as a method of Cooperative Learning. Jigsaw type of cooperative learning is a type of cooperative learning that consists of several members in one group responsible for control of parts of the study material and is able to teach the material to other members in the group (Arends, 1997).

Jigsaw cooperative learning model is a cooperative learning model in which students learn in small groups of 4-6 people are heterogeneous and cooperate positive interdependence and is responsible for the completeness of the material part of the lessons to be learned and deliver the material to the members of the group others (Arends, 1997).

Jigsaw is designed to increase students' sense of responsibility for their own learning and the learning of others. Students do not only learn the material given, but they must also be ready to give and teach the material in the other group members. Thus, "the student dependent on each other and must work together cooperatively to study the assigned material" (Lie, A., 1994).

The members of the different teams on the same topic meet for discussions (team of experts) to help each other about learning topics assigned to them. Then the students were back in the team / group home to explain to the other group members about what they have learned earlier at a meeting of the expert team.

Thus the Jigsaw type of cooperative learning model, there is a home group and expert groups. The home group is the main group of students consisting of students by ability, origin, and family backgrounds are diverse. The group of experts that the student group that consists of members of different origins were assigned to study and explore specific topics and complete the tasks associated with the topic for later explained to members of the original group. The expert group consists of students who capable of above average selected by the lecturer.

Steps in the application of Jigsaw technique in this study are as follows:

- a. Lecturers of the class divide students into five small groups. Each group consisted of four students with different abilities and each group includes one student who became head of the group. This group is called the home group. Each group was given the task of proving the origin of the different theorems contained in LKM (student worksheet). This task was given 2 weeks before learning activities were conducted, with the aim that the student group can discuss to prove theorems before the lecture held, so that when they are ready lectures.
- b. Each group leader in the home group gathered in a group called the expert group. Members of the group of experts to discuss the way turns presenting their respective tasks to each member of the expert group to understand all the tasks discussed.
- c. Each member of the expert group back to the original group to present the results of the discussion in expert groups.
- d. Furthermore, each home group present their presentations according to their respective duties. Presentations can be done alternately for each member of the original group.
- e. Lecturer gives awards to the group through the award scores based on presentation skills proving theorems and ability in answering questions from other groups.

2. METHOD

This research is a qualitative research and the subjects of study as a source of data in this study are students who engage in lesson study for real analysis 1 around 20 students. In the implementation of lesson study used three stages in each cycle that plan, do and see. The three stages are carried out in 4

(four) times a cycle of lectures lesson study. In accordance with the objectives of this research, then that becomes the focus in the implementation of learning real analysis 1 run through lesson study is the students' ability to prove theorems.

At the stage of plan (plan) conducted 1 (one) week prior to the implementation of learning. Activity plan carried out with the aim of jointly together to assess the teaching plan and teaching materials that have been planned covering the syllabus subjects, Learning Implementation Plan (RPP), the material or the teaching materials will be given to students, teaching methods, students' worksheets (LKM), lecturer model that will play along with the observer, and the necessary evaluation instruments.

On second stage 'Do' (implementation) lecturer models tried to carry out the stages of learning according to the lesson plan that has been getting assessment and improvement (revised) in accordance with the advice and input. Meanwhile three (3) other lecturers who did not become a lecturer model of acting as an observer. In carrying out observation learning implementation, were also invited lecturers outside the group Real Analysis 1 course to participate observation learning (open lesson). The observations based on the observation sheet that was prepared once the action plan. Observations aimed towards students' learning activities during the lectures to discover interesting facts and phenomena associated with focus and goals to be achieved in learning. For the implementation of observation there is no division of the group so that the observer can freely to observe any groups. To strengthen the observation of documentation was created through the photos and video recordings (audio-visual) during the learning process. This documentation is done on behavior and general or special events during the learning process and valuable as authentic evidence of events during the course to reinforce the activities of reflection (see).

On stages of Reflection (see). The reflection done immediately after learning is completed. This activity was followed by all observers and lecturer and led by a moderator and assisted by a secretary who served as the minutes to record the results of the discussion. In this activity the discussion of the facts or interesting phenomenon discovered during observations to conduct analysis of possible causes and find a solution to fix it. Which is a major concern in this discussion is the activity of students' learning neither nor activities of lecturer. Through the activities of sensitizing lecturer reflection on the shortcomings and advantages in carrying out the task of learning. This means that, if the lecturers to continue to implement these valuable experiences, then gradually the quality of teaching in the classroom will increase gradually and continuously.

Data collection techniques and instrumentation. In accordance with the focus set out in lesson study for Analysis Real 1 course this improve the ability of students to prove theorems through jigsaw cooperative learning, then the data needed in lesson study activities include: (1) cooperation within the group of experts, (2) cooperation in the home group, (3) the ability of the presentation, (4) the enthusiasm of the students in listening to the presentation, (5) the ability to respond to presentation, (6) students' understanding of the theorem, (7) the accuracy in the use of symbols, (8) the ability of proving theorems systematically, (9) the ability of providing a reason each stage of proving the theorem, (10) the accuracy in the proof of the theorem.

This research used content of results analysis of observations on the activities undertaken do and see as data analysis. In the analysis of the content of these things include: information collection, reduction, verification and conclusion. To describe an exclamation in the ability of students in the proof of the theorem is used descriptive data analysis.

3. RESULTS AND DISCUSSION

Students in Learning Activity Data

Based on the observation ability of students in proofing of the theorem in the learning process started from cycle 1 to cycle 4 is as follows:

Table 1. Data of students' ability to prove theorems in cycle 1

Student Activities	Description of Observations
Jigsaw Model	
1.1. student in the group of experts work just as well	only 2 students who can present its job well enough, others are still not able to.
1.2. students work together with other students to solve problems (LKM) in their home group	Good cooperation, but there is still much confusion in giving the reasons each stage of proof.
1.3. student group presentations, able to convey properly.	Group 1 is still wrong in the proof, while the other group in the presentation still like copying hail discussions, so it looks not understand.
1.4. Another group of students listened enthusiastically	If the presenters' explanation was good, then the other students listened enthusiastically and vice versa.
1.5. Another group of students responding to the presentation of the group that developed	only 2 students who responded to the presentation asking for proofing inquire missteps
Think Ability	
1.1. students understand the theorem correctly	Most students already understood, but there is still yet to understand the purpose theorem
1.2. students are able to use symbols correctly	Seeing notes in using symbols
1.3. the student is able to prove theorems systematically	Still not able to prove systematically, still largely rote.
1.4. students are able to justify each step of proof correctly	Some reasons given in the stage of proof is still wrong
1.5. Student prove theorems properly / correctly	Most of them are no errors in the verification step

Table 2. Data of students' ability to prove theorems in cycle 2

Student Activities	Description Of Observations
Jigsaw Model	
1.1. students in expert groups work well together	- each member of experts group proving theorems in accordance with his duties - There is still a member of the embarrassment of asking
1.2. students work together with other students to solve problems (LKM) in each home group	During the discussion on the home group there were still members are confused because there is no chief of group, but they are still trying to discuss about proving the theorem
1.3. student group presentations, able to convey properly	- Group 1 still do not understand the theorem has been proved. - Groups 2 and 4 are good in presenting accompanied by explaining the reasons for taking the first step in the proof. - Group 3 still do not understand the steps of proof by mathematical induction. - Group 5 is pretty good in the present.
1.4. Another group of students listened enthusiastically	Each group had listened presentation enthusiastically
1.5. Another group of students responds to the	in the beginning of the presentation is still no response, but

presentation of the group	after lecturer gives direction so asked, finally there is another group who responded.
Think Ability:	
1.6. students understand the theorem correctly	Students still have trouble using the previous theorem as a basis for the next theorem proving.
1.7. students are able to use symbols with the correct	Writing symbol correctly
1.8. the student is able to prove theorems systematically	<ul style="list-style-type: none"> - Group 1 is still not systematic - Groups 2 and 4 already systematics - Group 3 still wrong in the proof of mathematical induction - Group 5 is pretty good
1.9. students are able to justify each step of proof properly	<ul style="list-style-type: none"> - Group 1 is still lacking in giving reasons in each step verification - Group 2, 4 and 5 have been detailed in giving reasons every step verification - Group 3 is still one of the steps of proof using mathematical induction
1.10. Student are proving theorems with proper / correct	Overall it has been fixed, but the reason is less precise steps.

Table 3. Data of students' ability to prove theorems in cycle 3

Student Activities	Description Observations
Jigsaw Model	
1.6. students in the group of experts work closely with good	discussions at the expert group did not work well because each member of the group do not understand their duties properly
1.7. students work together with other students to solve problems (LKM) in each home group	could not walk properly because the group leader has not understood correctly
1.8. student group presentations, able to convey properly	<ul style="list-style-type: none"> - Group 1: incorrect in explaining the definition of the upper limit and lower limit, eventually a group of 5 that helps explain it. - Group 2: It's been good to describe them because they understand - Still one in proving the lemma, did not understand lemma - Group 4: still wrong in describing an example because it has not ideology - Group 5: has been able to explain an example of a well
1.9. Another group of students listened enthusiastically	No students were asked for their confused
1.10. Another group of students responding to the presentation of the group that developed	No one responded
ABILITY TO THINK:	
1.11. students understand the theorem correctly	students do not understand the theorem
1.12. students are able to use the symbols correctly	Able to use symbols but do not understand the meaning of it
1.13. the student is able to prove theorems	are not able
1.14. students are able to justify each step of	students are able to justify each step of proof correctly

proof correctly	
1.15. Student prove theorems properly / correctly	only group 2 were correct, the other is still wrong

Table 4. Data students' ability to prove theorems in cycle 4

Student Activities	Description Of Observations
Jigsaw Model	
1.11. student in the group of experts worked together correctly	Discussion goes well, a student explains and the others ask that occur each member opinions.
1.12. students work together with other students to solve problems (MFIs) in each home group	discussion goes well, a student explains, the other asks that occur each member opinions.
1.13. student of group presentations able to convey properly	Explanation can be accepted favorably with other student
1.14. Another group of students listened with enthusiasm	Pretty excited, although there were still speak for themselves when there were presentations
1.15. Another group of students responded to the presentation of the group that developed	When the presenters make a mistake, another group immediately respond it quickly.
Ability To Think:	
1.16. students understand the theorem correctly	Students understand about proving well
1.17. students are able to use symbols correctly / properly	Symbols used are correct, eg \forall , \exists , \exists , ε and others.
1.18. the student is able to prove theorems systematically	Students have been able to proof properly and systematically
1.19. students are able to justify each step of proof correctly	Students have been able to give a good reason with every step verification
1.20. Student are able to prove theorems properly / correctly	Overall students have been able to prove it right.

4. CONCLUSION

Based on these data and the results of the discussion in the implementation of lesson study for Real Analysis 1 in Mathematics Education Department, University of Muhammadiyah Gresik, it can be concluded that the jigsaw cooperative learning model can improve students' ability to prove theorems. Although in 3 cycles to decrease the ability of the evidence, this is because the level of difficulty is quite high.

Based on the results obtained from the implementation of lesson study for Real Analysis 1, which will directly impact students and faculty, the authors suggest to apply the lesson study for the other courses so that the quality of learning in Mathematics Education Department at University of Muhammadiyah Gresik going to be better than before.

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THE CONTRIBUTION OF HANDBOOK TO OVERCOME THE STUDENTS' DIFFICULTIES IN LEARNING ENGLISH AT SMP COKROAMINOTO PALOPO THROUGH LESSON STUDY

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Abstrak : SMP CokroaminotoPalopo is one of the schools that was selected by the University of CokroaminotoPalopo, particularly the Faculty of Teacher Training and Education to be its collaborative school in implementing *Lesson study* since 2015. This paper is an attempt to describe the contribution of the *lesson study* which is called “*handbook*” to overcome the students’ difficulties in learning English at SMP Cokroaminoto Palopo through *lesson study*. The population of this research is the eight year students were the researcher, the role model teacher implemented *lesson study* under the guidance of the selected English lecturers from the University of Cokroaminoto Palopo as the learning community team. As a role model teacher, the researcher received some suggestions from the team in the *plan* session for the purpose of improving the quality of the lesson plan to include the methods, the media, the students’ worksheet, and the evaluation to be used in the *open class* session. Similarly, in the *reflection* session, the researcher also got some suggestions and recommendations from the learning community team as observers in order to improve the quality of the learning process for the next meeting. During the process of the implementation of the *lesson study*, the researcher created one media which is called “*handbook*”. It contains useful vocabulary that the students can use in the leaning process. The researcher data show that this particular “*handbook*” overcome the students’ difficulties in learning English. In addition the students enjoy and relax in learning English.

Keyword : Handbook, Learning Community, Overcome, Students’ Difficulties.

1. INTRODUCTION

SMP Cokroaminoto Palopo is one of the private schools in Palopo which was selected by the University of Cokroaminoto Palopo as a collaborative school in implementing *lesson study* since 2015. There are two subjects at SMP Cokroaminoto Palopo in which *lesson study* are implemented, they are English and Mathematics.

There are many problems faced by the teachers at SMP Cokroaminoto Palopo to include English teachers. Among those problems, especially faced by the English teachers are: the students lack vocabulary, reluctant to open dictionary, and even they cannot make use of English dictionary properly. As a result, it takes time for English teachers to explain every word that students does not understand its meaning. The other problem is the students lack motivation and restless when they are learning. In addition, the condition of the students in relation to their family background, for example broken home and low income gives contribution to the students’ attitude in learning.

The situation above demands English teachers to be creative in order to create enjoyable learning atmosphere and to reach the learning goals. Sometimes the teachers confused about how to make the students focus to study, relax, enjoy, and how to make the situation in the classroom interested for them. However, since the teachers implemented the lesson study, these problems can be reduced. This is because before conducting the teaching and learning process in the classroom, the teachers and the lecturers from University of Cokroaminoto Palopo discuss and share knowledge and experiences on many things related to the learning process.

The teachers and the lecturers as learning community discuss, for example, what teaching materials are suitable for the students in this kind of circumstances, how to stimulate the students to be critical thinkers, how to help the students to explore their basic knowledge, what teaching media are appropriate to use, how to evaluate the learning process, how to arrange the sitting, etc.

Lesson study, as generally implemented, consists of three phases, they are “*plan-do-see*”. The planning phase begins with the selection of the topic, and it encompasses the study of teaching materials

and mapping out lesson plans. In the *plan* session, the English teachers get many inputs and ideas on how to organize the class.

The process of lesson study is initiated by setting a goal. The teachers 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, 2003).

This is what we practice at SMP Cokroaminoto Palopo, English teachers and English lecturers work collaboratively to map out the lesson plans hoping that before entering the class, English teachers have already had a good understanding of their learners' needs, pre-knowledge and misconceptions. In the plan session, English teachers are encouraged to anticipate the challenges learners may encounter in the lesson and to be prepared with appropriate methods and strategies to assist them. After the planning phase, the teachers conducted the study lesson (*open class* or *do phase*) based on the plan that have been discussed.

In the process of *open lesson*, English lecturers and sometimes students from the University of Cokroaminoto Palopo who are doing teaching practice as well as other teachers from other subjects and lecturers from different study programs are invited to observe the lesson. All observers are encouraged to contribute to refining and improving the lesson by asking for clarification, recognizing the strengths or good aspects and identifying the challenges.

2. RESEARCH METHOD

This research is library research. The researcher describes the English teacher' way in implementing Lesson Study at SMP CokroaminotoPalopo.

3.1 Place and Time of the Research

This research was held in 2015 at SMP Cokroaminoto Palopo.

3.2 The number of sample in this research is 18 the students. The researcher took and involved all the students in the eighth grade.

3.3 Procedure of Collecting Data

- a. The researcher collected the report from the observers and based on my experience as an English teacher who have conducted *Lesson Study* in class
- b. The researcher collected the video and report from Lesson Study team
- c. The researcher collected the notes of result discussion plan and see session

3.4 Technique of Analyzing Data

The data were analyzed by tabulating and presenting the activities.

3. FINDINGS AND DISCUSSIONS

The problems of students in English learning can be solved after conducting *open class* 1 until 4. This is because the process applied in all the stages in *Lesson Study* was very significant in the learning process based on the results of the discussions in the *plan* and *see* between model teacher and observers team of Lesson Study. The following data regarding the description of the activities of the lesson study on English learning in SMP Cokroaminoto Palopo based on the notes of discussion *plan* and *see*:

Table
The Notes Discussion Plan and See

The result of Discussion Plan and See		The realization	
<i>See 1</i>	<ul style="list-style-type: none"> ➤ The teacher Give <i>stimulus questions</i> to make the students be active, so the students can have the same opportunity to respond to the stimulus provided by the teacher. ➤ Granting to the students using an envelope was able to attract the curiosity and attention of the students 	<i>Open Class 2</i>	<p>The stimulus questions makes the students be more active in learning process.</p> <p>The tasks of students in envelope quite successfully focusing the attention and curiosity of the students</p>
<i>Plan 2</i>	<ul style="list-style-type: none"> ➤ The use of learning video is alternative to draw attention of students and as a medium for students to analyze the differences between "<i>congratulating and complementing</i>". 		<p>The used of learning video make the students are focusing to show the video. This situation can be an inspiration for students to make the difference expressions like in the video.</p>

	<ul style="list-style-type: none"> ➤ The students have limited vocabulary in english learning, so the model teacher should facilitate dictionary or collection of vocabulary needed to the students. 		Collection of vocabularies facilitated to the students called the “ <i>handbook</i> ” is the result of creativity of the model teacher.
See 2	<ul style="list-style-type: none"> ➤ LCD projector which is less good influence on students’ ability to understand the meaning or purpose which is displayed ➤ The model teacher facilitate vocabulary required of students in English learning to the effectiveness time of learning 	Open Class 3	The ability of the teacher give clear instruction while displaying video learning is helpful the students in understanding of learning objective The use of the <i>handbook</i> in learning process make the students exited and very happy to follow the learning
Plan 3	<ul style="list-style-type: none"> ➤ Setting learning through games to attract the attention of students ➤ Provide a handbook for the students to effectiveness the learning process. ➤ Pairing model to dialog practice in front of the class expected to enable the students 		Students look happy, enjoy and relax follow the learning process The students get “ <i>handbook</i> ” by the model teacher, and the students are very happy because they can find the vocabulary that their need. Pairing model for the students in front of the class is focusing the students to learn and try to give the best performance
See 3	<ul style="list-style-type: none"> ➤ The awarding of the handbook in order to keep the attention of the teacher model in every learning process because it helps students ➤ Take distance far enough away from the students to ask for opinion or their responsibility to build the confidence of students 	Open Class 4	The <i>handbook</i> makes the students easy to find a vocabulary that they need It quite successful to train students to have confidence in answering the questions the teacher
Plan 4	<ul style="list-style-type: none"> ➤ The learning outdoor for students expected can provide valuable experience to students and the involvement of all the students in the learning process can be achieved ➤ The students ability to percentage of their report in front of the class can make the students be active in every group 		Students look very excited and enjoy to follow the activity of learning in outside of classroom the surprise of the students being able to precentate their results report with a good and right sentences
See 4	<ul style="list-style-type: none"> ➤ The use of learning media and granting the relevant tasks with difference model task improved for better in each meeting in order to make students more active ➤ Granting the <i>handbook</i> can be a specific model for the teacher in every learning process, besides that as a the material for memorizing to the students. ➤ The arrangement of the class should be the first attention to the teacher before starting her learning process for the situation to be comfortable class. 	Next Learning	

The description above based on the result of discussion *plan* and *see* in every cycle of lesson study. The table above only describes things that are directly related to the issues discussed in this paper.

The description above suggests that every teacher needs a good preparation before teaching. As SyaifuddinNurdin and Basyiruddin Usman opinion, they said that “*teaching is a task so complex and very hard, so it can’t be done well by anyone without preparation though he has several years of teaching experience*”. (Syaifuddin Nurdin and Basyiruddin Usman, 2002: 85). Therefore through lesson study on the stages of the *plan*, preparation of teachers in delivering learning to be better because all plans and stages of learning in the classroom as well as goals to be achieve jointly formulated by model teacher and observers team.

Based on the Process of Lesson Study (source: Cerbin, W&Kopp. B(2011). Lesson Study Guide. Retrieved November 21, 2015 From <http://www.Uwlax.edu/sotl/lsp/guide>): There are some steps in applying lesson study:

1. Forma team
2. Develop Learning Goals
3. Design the lesson
4. Plan the study
5. Teach and Observe
6. Analyze & Revise
7. Document & Disseminate

In SMP Cokroaminoto Palopo, the model teacher applied lesson study based on the program of lesson study program at Faculty of Teacher Training and Education in University of Cokroaminoto Palopo. The program consists of:

1. Workshop Lesson Study

In this moment, the lecturers and teachers are grouped into several teams. They were given guidance in applying lesson in their team.

2. Workshop Teaching Plan and Teaching Material

In this workshop, the teachers were given guidance in designing lesson plan and observing a class by expert from government.

3. Open lesson and Reflection Practice

In this workshop, the teachers were given guidance in teaching in class and conducting reflection.

4. Document and Dissemination

In this step, the teachers wrote their portfolio and disseminate it in University of Cokroaminoto Palopo.

4. CONCLUSIONS

During the process of the implementation of the *lesson study* at SMP Cokroaminoto Palopo the researcher created one media which is called "*handbook*". It contains useful vocabulary that the students can use in the learning process. The researcher data show that this particular "*handbook*" overcome the students' difficulties in learning English like the students lack vocabulary, reluctant to open dictionary, and even they cannot make use of English dictionary properly. Because the process applied in all the stages in *Lesson Study* was very significant in the learning process based on the results of the discussions in the *plan* and *see* between model teacher and observers team of *Lesson Study*. In addition the students enjoy and relax in learning English.

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LESSON STUDY IN STRENGTHENING THE LEARNING MODEL OF DOTA IN THE COURSE PRACTICE FIELD STUDY (KPL)

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Abstract: A major challenge faced by the author as lecturer is how to sharpen the skills of student in learning, communication, discipline, courage and confidence so that they can be a good teacher in the future. A good teacher who enjoyed their profession and aware, that the task of the teacher is not only to teach but educates students "learn how to learn" cognitive, affective, and psychomotor. Students are expected as a prospective teacher who wants to continue to learn and be able to be creative as an effort to improve the learning quality. One of creativity that made by students are they able to find new ideas. One example is learning model of Dota that made by student and has never existed before. This study aims to 1) describe the implementation learning model of Dota to improve the learning quality of Social Studies, and 2) describe the strengths and weaknesses of the learning model of Dota in Social Studies. The class that used to practice the learning model of Dota on *Kajian Praktek Lapangan* course in Gasal Semester 2016/2017 that followed by 18 students. Lesson Study (LS) used to strenghten the learning plan, practice, and reflection. The results of this study suggest that LS can improve the quality Social Studies with learning model of Dota.

Keywords: learning model of Dota, strength and weakness, lesson study

1. INTRODUCTION

The big challenge faced by author as lecturer on subjects KPL (*Kajian Pengalaman Lapangan*) is how to sharpen the skills of students. Discipline, learning skills, communication skills, and confidence, so that they can enjoyed his profession as a teacher in the future. Teacher professionalism is strongly associated with the capabilities of planning, implementating, and evaluating of their teaching. Sumardianta (2013) said that great inspiring teacher is laudable and they can teach the complex material in a simple manner or to simplify complex things. Teachers are appreciated because they respect their students, they obliged to deliver happiness and always consider the intelligence of students to adjust their teaching style match to the student's learning style. Thus there is a need for paradigm shift from behavioristic to constructivist. So, it's not longer the time a teacher to tell but give students opportunity to find out, so that learning becomes more important meaningful for students.

A teacher should be aware, that the task of the teacher is not only to teach but also educates. The essence of education is actually "learn how to learn" that teachers educates students to learning cognitive, affective, and psychomotor. So through this course, students are expected as a future teacher who wants to continue to learn and be able to hone creativity in an effort to improve the quality of learning as well as being a professional teacher. Professionalism mean teacher who really waited for the attendance by students, teachers do not impose anything on the students, but to guide the ability of the students. As Ki Hadjar Dewantara warned that "education" (*opvoeding*) is something broader and more essential than teaching. Education intends to "lead all the forces of nature that exist in children, so as a human beings and as members of society, they can attain salvation and happiness as high as possible (Latif, 2016).

Learning strategies used in KPL is peer teaching based on Lesson Study. By adoption of LS patterns, lesson plans can be created collaboratively with other students and supervisor teacher (DPL). When KPL student doing teaching practices in the classroom, students and DPL can become observer as means of providing comments and suggestions for learning improvement in formal forum.

One aspect of learning that students can try to develop and practice within the KPL are developing lesson plans, instructional media, compiling workable evaluation instrument, even creating new learning model as it has been initiated by the students of this 2016/2017 KPL course.

Beginning from the pleasure of playing Dota video Game, students of Social Studies Education named Muhammad Musfin Nadzir intended to apply that Dota game in peer teaching practice in KPL. The result is because the pleasure of playing a game, it makes a person addicted or addicted to continue to play without them knowing the time that is used. However, lucky for students who are taking this KPL, they can take the positives from the game, so the game has also been inspiring for another students.

Peer teaching can be used as a learning laboratory where students practice before their actual classroom teaching. Sen (2009) states that peer teaching is learn to teach on a limited scale, limited in the number of students and the role the student are become teacher and students

Based on the introduction above, this study aims to 1) describe the application learning model of Dota to improve the quality of learning in Social Studies, 2) illustrate the strengths and weaknesses learning model of Dota in Social Studies.

2. RESEARCH METHODOLOGY

This research was conducted on July 2016 (July 18 to July 29, 2016). The location is in the Social Sciences Faculty building I1.301 UM. Subjects were 18 students of Social Studies that taking courses KPL on 2016/2017. This study was designed using a qualitative descriptive approach descriptive to implement LS.

In this research, the role of author is as observer, which collaborated with five other students. According to Ibrahim (2008: 52) phases of LS can be summed up in three phases: plan, do, see. Based on these opinions, the procedure in this research includes three stages, namely the plan (planning), do (execution), and see (reflection), as shown in Figure 1 below.

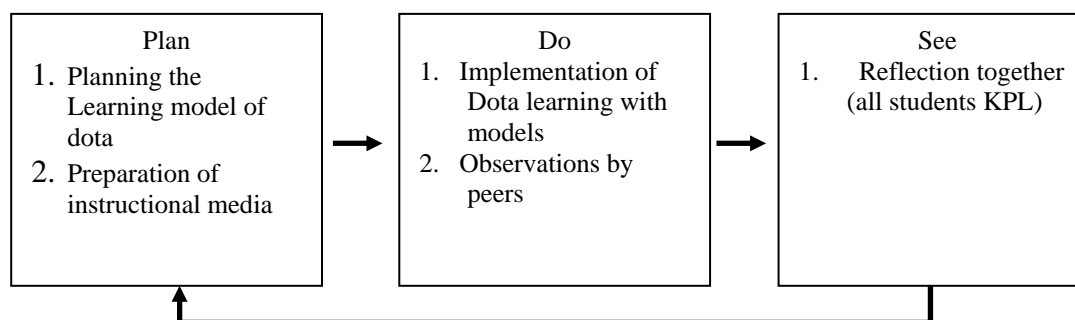


Figure 1. The series of activities Lesson Study

The first activity is a plan, this phase aims to produce learning design to effectively and arouse the students' participation in learning. In this phase it is prepared any form of learning device that consists of RPP, instructional media, teaching material summary, evaluation instrument and observation sheet. Planning is done collaboratively by several Social Studies students in with guidance of DPL. Various idea are shared between DPL and students collaboratively to organize KI, KD, theme, Achievement Indicators Competence (GPA), Learning Objectives (LO), instructional media, teaching and learning process activities, learning resources, and assessment.

The second activity is do (implementation), this phase is intended to implement the lesson plan that has been built. One member of the group (students) serves as a teacher model and other group members act as an observer along with DPL. Observer records all processes that occur during learning takes place, but the focus directed learning activities done by students with assistance of observation sheet. During the learning takes place, the observers are not allowed to disturb the learning process but

they should sit, stand, walk around, and recording with the camera. The main purpose is to observe the students during the teaching-learning process, so that the observer can learn from the ongoing study.

The third activity is see (reflection), this step is intended to discover the advantages and disadvantages in teaching implementation. Students who served as the teacher model, started the discussion by telling about the impression of teaching he perform. The next opportunity given to observers to tell what phenomenon has been gained during the learning takes place. Criticisms and suggestions submitted wisely without degrading the model teacher in order improve future teaching practices. Based on all of input gained in reflection, the teacher model then redraft the next course.

Data collecting in this study is done by using observation, focused discussion, and documentation. Observations made at the time do (exercising) with the help of observation sheets, cameras, and video cameras. The focused discussion activities is carried out during the reflection in which all discussion results write carefully through note record. All the data in the form of observation sheets, note record, lesson plan, worksheets, photos, videos, and instructional media documented are analyzed qualitatively.

3. FINDING AND DISCUSSION

LS in Strengthening Learning model of dota

Plan

Activities performed on stage plan was to discussed what will be done in the learning. At this stage, each team member (students and DPL) provide input for the desired learning objectives that can be achieved. As already mention by Susilo, et al. (2011) stage plan aimed to generating learning design which is believed to educate students in learning. Matters discussed in this stage include the improvement of Lesson Plan (RPP), instructional media, material summary, and the assessment.

Before drawing RPP first thing to do is analyze the KI and KD contained in the curriculum of 2013. KI and KD are adapted to the school curriculum to be used for skill practice in the field. KD determined by the school, namely KD in class VII semester of 1. KD used to develop in the RPP is KD 3.2 (Chapter 2, Social Interaction).

Social Interaction theme are appropriate with learning model of Dota because this material contain explanation about cooperation, competition, the interaction between the individual and groups that will urge by game in Dota. Indirectly students will experience the practice of social interaction, so the learning are meaningful for them. In terms of preparation, this model can considered cheap because only requires a blackboard for drawing without the need of LCD projector. As revealed by Indrawati (2011) are some considerations or principles for selecting appropriate learning models, namely: learning objectives, the nature of the subject matter, the availability of facilities and infrastructure, the ability of teachers, students' conditions, and time allocation.

The result gain by stage of RPP completion include: first on the initial activities, apperception which displaying an example of the interaction by teachers pretended to be picking up the phone and the teacher ask on students to dispose the waste, and then associate this example with material to be discussed that is Social Interaction. Apperception is an important part in the first minute of learning, because it will determine how further learning is done. As revealed by (Mansur, 2015) apperception in the early stages of learning is sometimes forgotten so can lead many learning activities to failure. Apperception can create effective learning because can lead learners on the condition (zone) alpha, which is the best condition for learning so that learners more easily absorb the material. Chotib (2012: 79) states that apperception will help draw the attention of the student or give curious / curiosity that is a very important in starting the teaching activities.

Second, the core activities there are things that need to be discussed together, especially syntax or learning steps using learning model of Dota. Based on the discussion results syntax-syntax learning model of Dota as follows:

Table 1.1 Syntax Learning Model of Dota

Phase		Teacher Behavior
Phase 1	The division of the group	The teacher divides the students into heterogeneous groups (4 groups) with a number of students 4 in each group
Phase 2	Megorganisasikan students for discussion	Teachers provide discussion material in the form of teaching material and help students to define and organize learning tasks that each student in the group of at least make one pertanyaan and 1 answers
Phase 3	Help investigate independently and groups	Teachers encourage students to get the right questions and answers and looking for an explanation
Phase 4	Merging group	Teachers combine two of the group to be a single group, so there are two large groups that are ready to play the game Dota (see Figure 1. Model Design Class settings when the game Dota)
Phase 5	Give instructions to the rule of Dota	The teacher gives an explanation of the rules of the game Dota (see Figure 2. Board Game Model and Game Rules Dota)
Phase 6	Each team asks the question and answers interchangeably	Students do the game and the teacher acts as a facilitator / mediator / referee in the game Dota
Phase 7	Analyze and evaluate the results	Teachers help students to reflect on their learning processes they have done with the model Dota

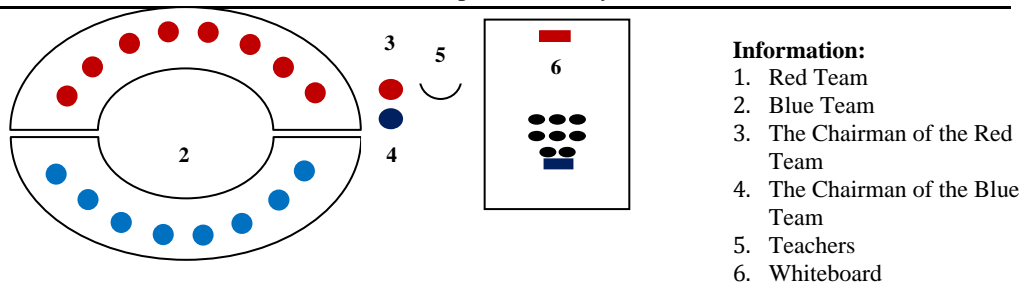


Figure 1.1 Model Design Class Settings When Dota Game



Figure 1.2 Board Game Learning Model of Dota

Description Dota Game rules

1. At the beginning of the core activities of learning, the class is divided into 4 groups, where each group of 4 students
2. Once the group is formed each group was asked to make a minimum of four questions and answers (in accordance with the number of group members. Questions and answers are based on the material

being studied. The teacher can first give articles or instructional materials that can be used by students as a source to create questions and answers, and provide LK teachers to create questions and answers.

3. After each group finished making questions and answers, the students formed into two large groups (Each team consists of 8 students)
4. Each team is given the freedom to choose a team leader
5. The team leader in charge of guiding the course of the game assisted by the teacher as facilitator and mediator
6. Each team has 8 fortress or tower, they are free to attack opponents castle, but before the fort in front of exhausted, then they can not attack the castle behind him, and so on until there is one team that could reach the fort behind the fastest, meaning they is winner
7. The team leader did suit. For those who win are given the opportunity in advance to choose which one will be attacked castle. Then for the offense will be asking questions to the opposing team and the opposing team must answer the question.
8. If the opposing team managed to answer questions from the attacking team, the fortress of the attacker will be lost (part of the fort lost linearly with the currently selected fortress attack).
9. If the other team can not answer the question of the attacking team, the opponent team fortress will be lost (missing part of the fort is a fort that had been at the beginning).
10. The time given for asking questions is 30 seconds, while to answer the question is 50 seconds, if the member question and answer more than it was then considered a failure.
11. Each member of the team has only one chance to ask and answer and one answer may not be reset, but can help provide feedback or ideas answers to friends who had the opportunity to answer. For those who have answered will get a red card, while already asked will receive a green card.
12. The game continues until there is from one of the teams who made it home opponents castle. But in the midst of a game the teacher can also give an opportunity to all two tim to change strategy games, such as changing the team leader, asked for time to make inquiries again, and so on.
13. For the losing team will get punishment , for example, congratulated the winning team (fair) or apologizing to members why the team could lose? etc.

At the end of activities, from the learning have been conducted from the beginning to the end, students are expected to deduce concepts from the events that have been experienced, for example, students can describe how social interaction can occur, the nature of social interaction, forms of social interaction, etc.

Do

Stage do as a whole has been successfully implemented in accordance with the plan, although there are some obstacles for example regarding time management is not good, because at the time the game takes place is often a debate among the team, so the class became hectic. To address the debate between the teams, the teacher's role is necessary to maintain the cohesiveness and team sportsmanship. Although there are several obstacles such as classes become crowded, but from the observation there are many students activities that very attractive during the implementation of learning with this Dota models.

For example, students are enjoying the game (a happy and sad feeling appear on the face of students), but of course here is not just a game but also a learning process occur. The team enthusiast and excitement maintain each castle they have by way of trying to answer as best as possible so that the logical reasons that they express can be accepted by all parties. Likewise when asking questions, each team trying to make the question so difficult to answer but still logical. Borrowing a term Bloom (Anderson, 2010) average of the questions that were made were at the level of C3 to C6 on Bloom's taxonomy, or known as HOTS (*Higher Order Thinking Skills*) . While the answers given each team varies greatly, but still at a logical level. Given that the answers in the Social Sciences is not singular, not as an answer to the Natural Science that in fact only have one definitive answer.

See

Phase *see* is the final session in the LS. Phase *see* aims to identify the advantages and disadvantages of learning implementation that has been done. This session also benefit to gain meaningful learning from learning implementation both formodel teacher and as an observer. See session begins with reflections of teachers about learning models that have been implemented then followed by *observers* who submit comments based on observations to students activities during the learning process.

From the reflection it is found that the model teacher feel quite satisfied because learning model of Dota is done successfully accordance with what is planned together. The overall achievement of the learning implementation is approximately 95%. Valuable lessons obtained by the model teacher is with an inspiration over the game that often played by children, the students can learn well.

The study showed that students get an enjoyfull learning, self-confidence, sportsmanship, risk taking, cooperation, and skills to constructcing knowledge through questions and answers they made. By following the game of Dota the students are directly involved with the contextual teaching material. They also can develop attitude of fair competition by each person congratulated the winning team member and make apologize to their team members.



Figure 1.3 Left Of Each Team Apresiate When Friend Speaking; Figure 1.5 Right, Lose Team Apologizes To Team Members Why Can Lose

The observations are recorded in accordance with the principles of learning to the curriculum in 2013 (Permendikbud No. 22 Year 2016 on the Primary Process Standard in Secondary Education), namely: (1) of learners are try to find out; (2) teacher is not the only source of learning but from a variety resources; (3) learning not only emphasizes single answer but also multi-dimensional answer; (4) not only verbal learning but also applicative skills; (5) balance between physical skills and mental skills; (6) learning that promotes cultivation and empowerment of students as lifelong learners; (7) learning to apply the values by giving exemplary.

Based on observations made observer as well as a questionnaire that has been filled by all MPA students obtained a description of the strengths and weaknesses of learning model of Dota. Excess learning model of Dota include 1) students are actively involved in learning; 2) easy to apply; 3) effective and efficient learning media because easy to made; 4) improve the competitive spirit among the team; 5) practice sportsmanship for students; 6) fun, and exciting; 7) training cooperation or teamwork ; 8) stimulating students' emotions (sad, happy, etc); 9) teachers actually act as a facilitator /mediator; 10) requires students to think quickly and accurately.

Weakness learning model of Dota are 1) classroom became hectic because of student's debate; 2) it requires a relatively long time; 3) The teacher must master the material, so he could be a fair jury.

The results of this study suggest that LS can improve the quality of teaching in Social Studies . In line with research conducted by Mardiana (2016), the research also showed that the

implementation of PBL combined with LS Mind Map is run very well, there is an increase of 8.6 student creativity %, and there are also enhancements to cognitive learning outcomes of students by 6.7%. This results similar with Mardiana Herath research (2015) which showed that the LS in the UM Biological Science department can enhance the quality of learning on plant physiology course.

4. CONCLUSION

Viewed from characteristic Learning model of dota, this model is suitable for applied in Social Studies, especially on the material social interaction. LS-based research is an early stage research on Learning model of dotas, so next it is necessary to get study about Dotamethods for further research and development.

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THE REFLECTIVE THINKING SKILLS OF PROSPECTIVE MATHEMATICS TEACHERS IN LESSON STUDY PRACTICE ON THE EDUCATIONAL INTERNSHIPS SUBJECT

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Abstract: This article reveals the reflective thinking skills of prospective mathematics teachers in lesson study practice to fulfill the task for Educational Internship Subject. Lesson study practice has three stages, namely PLAN - Planning, DO - Learning Practice and SEE - Observation and Reflection. Reflection activity is an activity that is essential in lesson study practice to find out the problems faced when practice lesson study and plan further improvements. Reflection activity requires good reflective thinking skills. The data collection activities performed in all together with Educational Internships Subject in Schools, involving three of college students and two of Mathematics Teachers. The results of this research indicate that (1) lesson study is able to develop the creativity of prospective mathematics teachers to prepare plans for quality learning, (2) to think reflectively assist teachers in developing learning models of effective and innovative, (3) lesson study to improve skills of prospective mathematics teachers in applying the learning that has been designed, and (4) Reflection activity which is taken collaboratively can improve reflective thinking skills of prospective mathematics teachers.

Keywords: Reflective Thinking Skill, Lesson Study

1. INTRODUCTION

Educational Internship courses (Field Experience Practice) covers the basic skills of teaching, lesson plan development, and instructional practice on a limited basis or integrated. Generally the purpose of implementation of the Field Experience Training (PPL) is forming personal mathematics teacher who has a set of knowledge, skills and attitude that fits perfectly in education and teaching. While specifically of interest PPL namely, (1) to know accurately the physical environment, administrative, academic, and social environment of the school, (2) implement various capabilities of potential teacher the whole and integrated in real situations, (3) is able to develop aspects of personal and social in the school environment, (4) draw conclusions educational value of appreciation and experience during the training through reflection and pouring result in making the report, and (5) be able to develop methods of learning in mathematics. Prospective math teachers in conducting apprenticeship education facilitated to collaborate in planning (PLAN), implementing (DO), and reflect (SEE) learning in school is called to the practice of lesson study. Things need to be assessed in the practice of lesson study is a reflection activities. Reflection activity is crucial for the improvement of future learning.

Lesson study has been practiced in Japan for so long that it has been taken for granted by Japanese Teachers and administrators. Researchers in the United States of America (USA) has been interested in lesson study as an effective model of teacher professional development (Stigler & Hiebert, 1999). 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. 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.

Lesson study is an activity undertaken by a number of teachers to work together to design lesson plans, capable of implementing quality learning according to lesson plans are prepared, make observations collaboratively, and able to solve problems. Lewis (2002) lesson study is a cycle in which teachers work together to consider their long-term goals for students, bring those goals to life in actual "research lesson", and collaboratively observe, discuss, and refine the lessons. 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.

According to Gurol (2011) reflective thinking is a process of purposeful activity and precisely where a person is aware to be able to analyze, evaluate, motivate, and get a deep meaning. Sezer (in Chee & Pao, 2012) states that the reflective thinking as an awareness of the information needed to solve the problem. Choy & Cheah (2009) and Rudd (2007) emphasizes that reflective thinking can develop optimally if the process associated with daily activities. Simultaneously lesson study activities performed in all together with Educational Internships Practice in Schools so that the reflection process carried out by the reality of learning is experienced, observed directly from a teaching practice in schools. Therefore, the process of reflection is not only based on theory, but also consider the facts and the problems encountered in practice in the classroom.

Lee (2005) identify indicators of reflective thinking, among others, recall, rationalization, and reflectivity are presented in detail in Table 1.

Table 1. Indicators of Reflective Thinking

Indicators	Description
Recall	<ul style="list-style-type: none"> • Describe the situation that occurred during the learning process of lesson study • Imitate the interesting things that happened during the practice of lesson study to be easily understood and interpreted • Comparing the reality of learning happens in the classroom with the expected learning in the planning process
Rationalization	<ul style="list-style-type: none"> • Linking learning practices in lesson study with the usual learning experience • Interpreting the observations results based on the accuracy of the data processing and rational reasoning • Comparing learning practices in lesson study with teaching experience possessed and the ideal condition to be expected
Reflectivity	<ul style="list-style-type: none"> • Conduct observations by recording all real condition that occurs when the practice of lesson study in writing • Detailing the activities of what has been done in the practice of lesson study • Classify which activities need to be improved or needs to be removed • Analyze the current situation in the classroom when the practice of lesson study • Analyze the learning process of each student, student interaction and the interaction between teachers and students

2. RESEARCH METHODOLOGY

This study reveals the reflective thinking skills of prospective mathematics teachers in lesson study practice performed in all together with Field Experience Practice to fulfill the task of the Educational Internships Subject. To reveal the reflective thinking skills of prospective mathematics teachers, the researchers asked to practice the lesson study. This study is natural, researchers as a data collector (human instrument), inductive data analysis, descriptive, and uses triangulation techniques. Based on these characteristics, the design of this research is descriptive qualitative (Creswell, 2012). Researchers participating directly in the observation process of learning along with the practitioner (college students who acted as model teacher), observer (2 college students and 2 mathematics teachers who acted as an observer) and 25 students of Senior High School in Muhammadiyah Kediri. Therefore, the method of data collection is participant observation. The model teachers in Lesson Study Practice were 3 college students. Students' data would be collected in this study were (1) the learning outcomes in the form of value on knowledge and skills aspects, (2) the attitude / behavior of students, (3) motivation and perception of mathematics, and (4) the interaction between teacher and the interaction between students in the learning process. Sub-materials discussion were selected in this study is Graphing

Exponential and Logarithmic Functions. Schematic diagram of lesson study implementation is presented in Figure 1 and observation sheet of Lesson Study (DO) for observers is presented in Table 2.

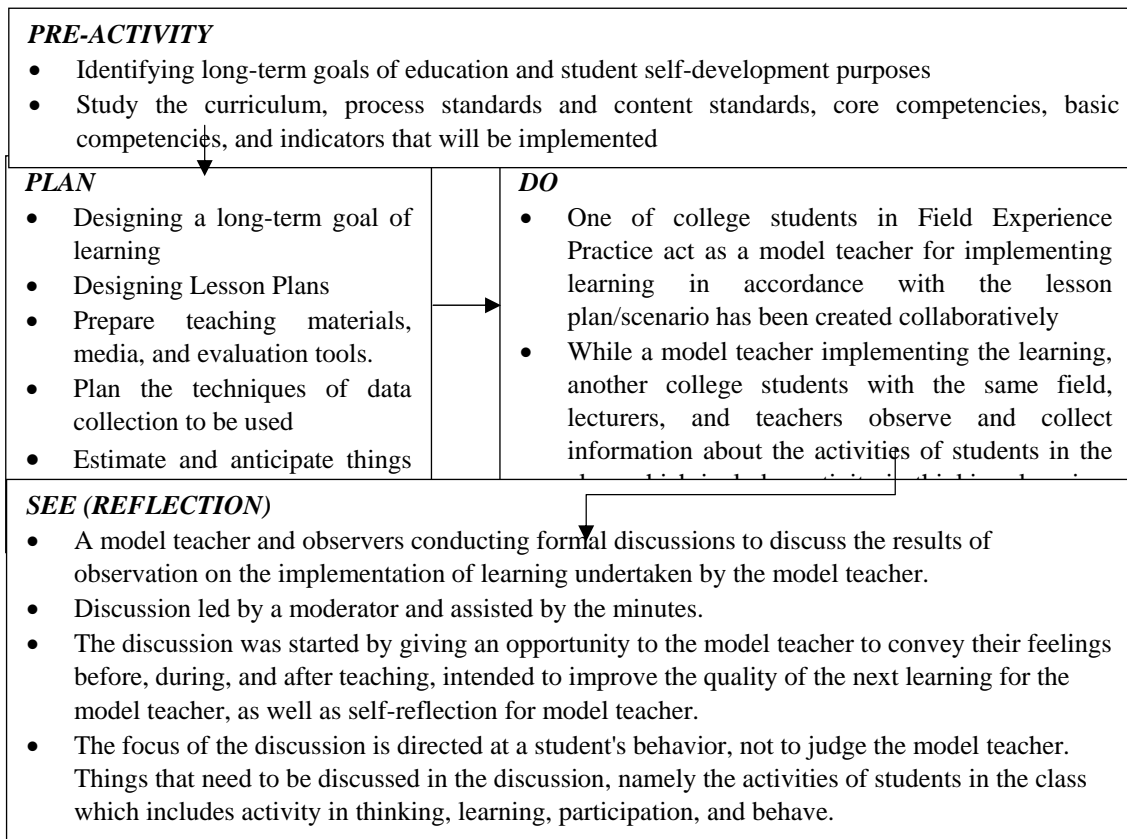


Table 2. Observation Sheet of Lesson Study Practice (DO)

No.	Event	Check
A.	When will students begin to concentrate?	
	1. Since the beginning of the learning activities	
	a. Students who concentrate is.....	All/Partly
	b. Students concentrate because:	
	There is an interesting phenomenon presented by the teacher?	Yes/No
	There is a phenomenon that is causing the problem?	Yes/No
	There are other reasons:
	c. Students who concentrate looks:	
	Asking problem / question	Yes/No
	Expressing opinions / ideas	Yes/No
	Paying attention in earnest	Yes/No
	2. At the time of the main activities of learning.	
	a. Students who concentrate is.....	All/Partly
	b. Students who concentrate looks:	
	Viewing a presentation/explanation of the material in class	Yes/No
	Discuss	Yes/No
	Doing task/worksheet	Yes/No

	Other activities:.....
B.	When will the students do not concentrate?	
	1. Since the beginning of the learning activities. a. The cause is..... b. Do not concentrate, look: Setting up the learning tools Discuss/do another task Other activities:..... Yes/No Yes/No
	2. Since the main activities of learning. a. The cause is..... b. Do not concentrate, look: Doing task/worksheet out of context/topics Talking out of context/topics Do not do any activity Yes/No Yes/No Yes/No
	3. Aspects of learning what can be learned useful for observers?	a. b. c.
	4. Aspects of learning what the observer does not need to be there, or not useful?	a. b. c.
C.	Other Notes:	

3. FINDING AND DISCUSSION

Model Teacher	Description of Lesson Study Activities
Model Teacher 1(MT1)	<p>PLAN</p> <p>Compile Lesson Plan with Brainstorming Learning Model Prepare the learning material that is graphing exponential function Develop media powerpoint presentation (ppt) Create questions/problems for Quiz 1 Create assessment rubric of knowledge, skills, attitudes aspects</p> <p>DO</p> <p>Model : Brainstorming Media : Powerpoint presentation (ppt) The syntax of Brainstorming Model: (1) Orientation (2) Identification/Analysis (3) Classification/Synthesis (4) Verification (5) Conclusion</p> <p>MT1 implement learning according to the Lesson Plan which has been prepared MT1 implementing the syntax of Brainstorming Learning Model Observers observe the activities of students in thinking, learning, participation, and behave Observers write the observation results in observation sheet</p>

	<p>REFLECTION I</p> <p>Thinking Activities When learning is taking place, there are some students who concentrations in doing exercises given by the teacher. But there are also some students who are not interested in doing exercises. Some of the things that cause their disinterest is:</p> <ol style="list-style-type: none"> 1) Do not bring terraced paper/milimeter block to draw graphics 2) Do not bring a ruler so had to wait for his friend finished drawing a graph, then borrow 3) Require a long time to test many points with the substitution method 4) Do not know the technique of drawing exponential function graphs correctly <p>Learning Activities The learning phenomenon looks as follows:</p> <ol style="list-style-type: none"> 1) Requires a lot more time on the formation of seating groups 2) There are some students who are playing the mobile/handphone when brainstorming takes place <p>Participation The phenomenon that looks as follows:</p> <ol style="list-style-type: none"> 1) Only smart students who participated in the brainstorming learning model 2) Students who are not good at giving opinions tend to be quiet <p>Attitude/Behaviour The phenomenon that looks as follows:</p> <ol style="list-style-type: none"> 1) Dishonest-Cheating other students when the quiz 2) Undisciplined-not gather quiz answer sheets in a timely manner 3) Do not respect the opinion of other students (for example, make a noise, speak another context when there are students who discuss or express opinions, etc.) <p>The results of Quiz 1 Based on the results of Quiz 1 discovered several phenomenon, namely:</p> <ol style="list-style-type: none"> 1) 68% of students did not meet the Minimum Completeness Criteria i.e. 75 2) Most of the students do not understand about asymptote and the properties of the exponential functions graphs 3) Many answers who have not finished, not even done. <p>Alternative Solutions: Using Inquiry Learning Model to discover the properties of exponential functions graphs so as to minimize the students in the point test. Using Geogebra to help students analyze the properties of exponential graph functions graphs. Mobile/handphone turned off when learning takes place Another lesson book closed and put in a bag Creating quiz questions into two different packages, namely Package A and Package B Remind the remaining time available before the quiz answer sheets are collected.</p>
Model Teacher 2 (MT2)	<p>PLAN</p> <p>Compile Lesson Plan with Inquiry Learning Model Prepare the learning material that is graphing exponential and logarithmic function Prepare Geogebra Create questions/problems for Quiz 2 Create assessment rubric of knowledge, skills, attitudes aspects</p> <hr/> <p>DO</p> <p>Model : Inquiry Learning Media : Geogebra</p>

	<p>The syntax of Inquiry Learning Model:</p> <ol style="list-style-type: none"> (1) Confrontation with the problem (2) Data Gathering (Verification) (3) Data Gathering (Experimentation) (4) Organising, formulating, and Explanation (5) Analysis of the Inquiry Process (6) Generalization <p>MT2 implement learning according to the Lesson Plan which has been prepared MT2 implementing the syntax of Brainstorming Learning Model Observers observe the activities of students in thinking, learning, participation, and behave Observers write the observation results in observation sheet</p>
	<p>REFLECTION II</p> <p>Thinking Activities When learning is taking place:</p> <ol style="list-style-type: none"> 1) Most of the students to concentrate on listening to the teacher's explanations about how to use Geogebra 2) Students concentrating observe the graphs of exponential and logarithmic functions in Geogebra. 3) Students analyze the properties of exponential and logarithmic graphs of functions and asimtot <p>Learning Activities The learning phenomenon looks as follows:</p> <ol style="list-style-type: none"> 1) Seating group has been arranged and the students are already seated in their respective groups 2) All of the mobile phone is switched off and the other lesson books put in a bag, so focus on the teacher's explanations <p>Participation The phenomenon that looks as follows: All of students actively use Geogebra to graph exponential and logarithmic functions.</p> <p>Attitude/Behaviour The phenomenon that looks as follows:</p> <ol style="list-style-type: none"> 1) Honest-cheat when the quiz has been reduced because it consists of two different packages 2) Discipline-all of students can collect the quiz answer sheets on time because teachers always remind the rest of the time available <p>The results of Quiz 2 Based on the results of Quiz 2 discovered several phenomenon, namely:</p> <ol style="list-style-type: none"> 1) 36% of students did not meet the Minimum Completeness Criteria i.e. 75 2) Students who have a lower mathematical ability has not been able to analyze the properties of exponential and logarithmic functions graphs through Geogebra 3) All of students could answer all of quiz questions, although there is a little error/mistake <p>Alternative Solutions: Applying Teams Games Tournament Model to enable students who are low mathematical ability to be motivated to ask other students/teachers about the difficulties experienced Teams Games Tournament Model should be selected because of the score of a</p>

	<p>team is determined by the ability of each of its members so all members are required to master all the material</p>
<p>Model Teacher 3 (MT3)</p>	<p>PLAN</p> <p>Compile Lesson Plan with Teams Games Tournaments Model Prepare the learning material that is graphing exponential and logarithmic function Prepare Geogebra Create questions/problems for Quiz 3 Create assessment rubric of knowledge, skills, attitudes aspects</p> <hr/> <p>DO</p> <p>Model : Teams Games Tournaments Media : Geogebra The syntax of Team Games Tournament Model:</p> <ol style="list-style-type: none"> (1) Class Presentations (2) Teams (3) Games (4) Tournament (5) Team Recognition <p>“Super Team” with $\bar{X} \geq 85$ “Great Team” with $75 < \bar{X} < 85$ “Good Team” with $\bar{X} \leq 75$</p> <p>MT3 implement learning according to the Lesson Plan which has been prepared MT3 implementing the syntax of Team Games Tournament Model Observers observe the activities of students in thinking, learning, participation, and behave Observers write the observation results in observation sheet</p> <hr/> <p>REFLECTION III</p> <p>Thinking Activities When learning is taking place: All of students interested and having fun in the game matching formulas and graphs of exponential and logarithmic functions suitable or appropriate</p> <p>Learning Activities The learning phenomenon looks as follows:</p> <ol style="list-style-type: none"> 3) Seating group has been arranged and the students are already seated in their respective groups 4) All of the mobile phone is switched off and the other lesson books put in a bag, so focus on the teacher's explanations <p>Participation The phenomenon that looks as follows: All of students actively use Geogebra to graph exponential and logarithmic functions through the game</p> <p>Attitude/Behaviour The phenomenon that looks as follows:</p> <ol style="list-style-type: none"> 1) Honest-All of students no cheating is due to understand the technique of drawing graphs of exponential and logarithmic functions 2) Discipline-All of students gather quiz answer sheets in a timely manner 3) Cooperation-All of members help each other in order to get the hang of members of their team to win <p>The results of Quiz 3 Based on the results of Quiz 3 discovered that 88% of students scored above the Minimum Completeness Criteria i.e. 75</p>

4. CONCLUSION

Lesson study is able to develop the creativity of prospective mathematics teachers to prepare plans for quality learning, to think reflectively assist teachers in developing learning models of effective and innovative, and to improve skills of prospective mathematics teachers in applying the learning that has been designed. Reflection activity which is taken collaboratively can improve reflective thinking skills of prospective mathematics teachers.

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Penerapan Model Problem Based Learning (PBL) Berbasis *Lesson Study* Terhadap Hasil Belajar Siswa pada Pokok Bahasan Hidrolisis Garam

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Abstract : Penelitian ini bertujuan untuk mengetahui: perbedaan hasil belajar kimia antara siswa yang diajarkan model *Problem Based Learning* (PBL) berbasis kolaboratif memanfaatkan media komputer dengan siswa yang diajarkan model *Direct Instruction* (DI) tanpa media komputer; Penelitian ini termasuk penelitian quasi eksperimen. Populasi penelitian ini adalah siswa kelas XI IPA di SMA Negeri 1 Rantau Utara sebanyak 6 kelas dan SMA Negeri 2 Rantau Utara sebanyak 4 kelas. Sampel penelitian ini sebanyak 2 kelas dari SMA Negeri 1 dan 2 kelas dari SMA Negeri 2 Rantau Utara. Instrumen penelitian menggunakan tes hasil belajar berjumlah 20 soal dalam bentuk pilihan berganda, angket dan lembar observasi tentang karakter kreativitas yang telah divalidasi oleh validator. Teknik analisis yang digunakan teknik Analisis varians dua jalur (*Two Ways Anova*) dengan bantuan program SPSS 16.0. Hasil penelitian disimpulkan bahwa: terdapat perbedaan yang signifikan hasil belajar kimia antara siswa yang diajarkan dengan model PBL berbasis kolaboratif memanfaatkan media komputer dengan siswa yang diajarkan model DI tanpa media komputer ($p = 0,000 < 0,05$); Ranah kognitif yang berkembang untuk kelompok siswa yang diajarkan dengan model PBL berbasis lesson study memanfaatkan media komputer yaitu: C₁ sebesar 91% (tinggi), C₂ sebesar 76,7% (tinggi), C₃ sebesar 61,5% (sedang), dan C₄ sebesar 60,9% (sedang).

Kata kunci : Problem Based Learning; Lesson Study, Hasil Belajar

The Effect Implementation Model of Problem Based Learning(PBL) with Utilization-Based Collaborative Media against Computer Learning Outcomes on Topic Hydrolisis Garam

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ABSTRACT : This study aims to determine: differences in learning outcomes between students who were taught chemistry model of Problem Based Learning (PBL) based on utilizing collaborative computer media with students who are taught Direct Instruction models without computer media; cognitive domains that develop between students who were taught PBL-based collaborative models use the media to teach computer model of Direct Instruction with out computer media. This study includes quasi-experimental study. The population of this research is the students of class XI Science SMAN 1 North sea coast as 6 classes and SMAN 2 North sea coast as much as 4 classes. The sample of this study was 2 classes of SMA Negeri 1 and 2 classes of SMAN 2 North Rantau. The research instrument used achievement testis 20 questions in multiple-choice form, question naire and observation sheet about the character of creativity that has been validated by the validator. The analysis technique used Two Ways ANOVA. The results of the study concluded that: 1) there are significant differences between students' learning outcomes chemistry taught with PBL-based collaborative models utilize computer media with students who are taught with out DI model of computer media ($p = 0.000 < 0.05$); developing cognitive domains for the group of students who were taught with PBL-based collaborative models utilize computer media, namely: C₁ amounted to 91% (high), C₂ amounted to 76.7% (high), C₃ amounted to 61.5% (medium), and C₄ amounted to 60.9% (medium).

Keywords : **Problem Based Learning; Lesson Study, Learning Outcome**

1. PENDAHULUAN

Mulyasa (2013) mengatakan untuk melaksanakan perubahan dalam bidang pendidikan UNESCO telah mengemukakan dua basis landasan yaitu yang *pertama* pendidikan harus diletakkan pada empat pilar yaitu belajar mengetahui (*learning to know*), belajar melakukan (*learning to do*), belajar hidup dalam kebersamaan (*learning to live together*) dan belajar menjadi diri sendiri (*learning to be*) dan *kedua* belajar seumur hidup (*life long learning*).

Dalam upaya membentuk karakter dan peningkatan hasil belajar siswa, seorang guru dituntut untuk mampu mengembangkan model pembelajaran yang merupakan hasil integrasi antara strategi pengajaran dengan media pengajaran. Model pembelajaran memuat komponen sistem pembelajaran dan unsur kegiatan yang dilakukan baik oleh guru dan siswa, yang menekankan pada keaktifan belajar siswa melalui guru yang aktif pula (Hakim, 2008). Chin dan Chia (2005), menyatakan bahwa *problem based learning* dapat menimbulkan proses kognitif siswa menjadi lebih baik dengan kebiasaan berfikir baik. Dalam pembelajaran *problem based learning* guru hendaknya menciptakan pembelajaran yang memicu siswa kearah pemikiran yang baik agar dapat menghubungkan hal yang satu dengan hal yang lainnya untuk memecahkan masalah belajar. Tentunya dalam pembelajaran tersebut guru dapat membuat strategi dan media pendukung dalam menyampaikan materi pembelajaran. Strategi pembelajaran berbasis masalah mengarahkan siswa lebih termotivasi untuk bekerja lebih keras dibandingkan dengan pengajaran tradisional yang mana keikutsertaan siswa sangat sedikit (Graaff dan Kolmos, 2003). Sungur dan Tekaya (2006), mengatakan Pembelajaran berbasis masalah dikembangkan memperbaiki keterampilan interpersonal, berfikir kritis, pencarian informasi komunikasi, rasa hormat dan kerja kelompok.

Jika seorang guru harus memberikan bimbingan secara individu kepada semua anak tentunya hal tersebut tidaklah mungkin. Menurut Masaaki (2012), siswa perlu didorong untuk mau dan sanggup berkomunikasi dengan anggota lain. Seorang siswa bertukar pendapat mengenai permasalahannya dengan siswa lain maka melalui kolaborasi yaitu kerjasama dengan siswa lain untuk menyelesaikan suatu permasalahan maka mereka akan menghargai keberadaan satu sama lain secara terorganisir melaksanakan suatu kegiatan dengan memadukan pikiran yang tadinya terasa asing bagi dirinya. Istarani (2011), mengemukakan bahwa proses belajar secara kolaborasi bukan sekedar bekerja sama dalam suatu kelompok, tetapi penekannya lebih kepada suatu proses pembelajaran yang melibatkan proses komunikasi secara utuh dan adil di dalam kelas. Hasil penelitian Zebua (2010), penggunaan model pembelajaran berbasis masalah menggunakan media *eXe-Learning* lebih tinggi 21% dari hasil belajar siswa tanpa menggunakan media *eXe-Learning* dapat meningkatkan hasil belajar kimia siswa dengan rata-rata gain sebesar 0,58 dan mempengaruhi aktifitas siswa secara signifikan sebesar 57,4 %. Priyambodo (2010), menunjukkan pemanfaatan program aplikasi *eXe Learning* dalam penyusunan media pembelajaran di sekolah menarik minat dan meningkatkan pemahaman kimia siswa serta menciptakan suasana belajar yang menyenangkan. Keunggulan media *eXe Learning* *eXe* merupakan salah satu program aplikasi *opensource* yang dipergunakan untuk pembuatan bahan ajar berbasis *e-learning*. Bahan ajar yang disusun dengan *eXe*, tersusun secara hierarki yang benar mencakup topic, section dan unit. Susunan yang demikian akan memudahkan siswa untuk lebih memahami materi kimia.

Berdasarkan uraian di atas maka tujuan penulisan artikel ini adalah Mengetahui pengaruh “**Penerapan Model Problem Based Learning (PBL) Berbasis Lesson study dengan eXe learning Terhadap Hasil Belajar.**”

2. METODOLOGI

Sampel dalam penelitian ini diambil dua kelas untuk setiap kelas XI pada masing-masing sekolah yang diambil secara random dengan menggunakan teknik pengambilan secara *sampling purposif*,

yaitu teknik pengambilan sampel secara acak. Berdasarkan pertimbangan peneliti dengan perlakuan sebagai berikut:

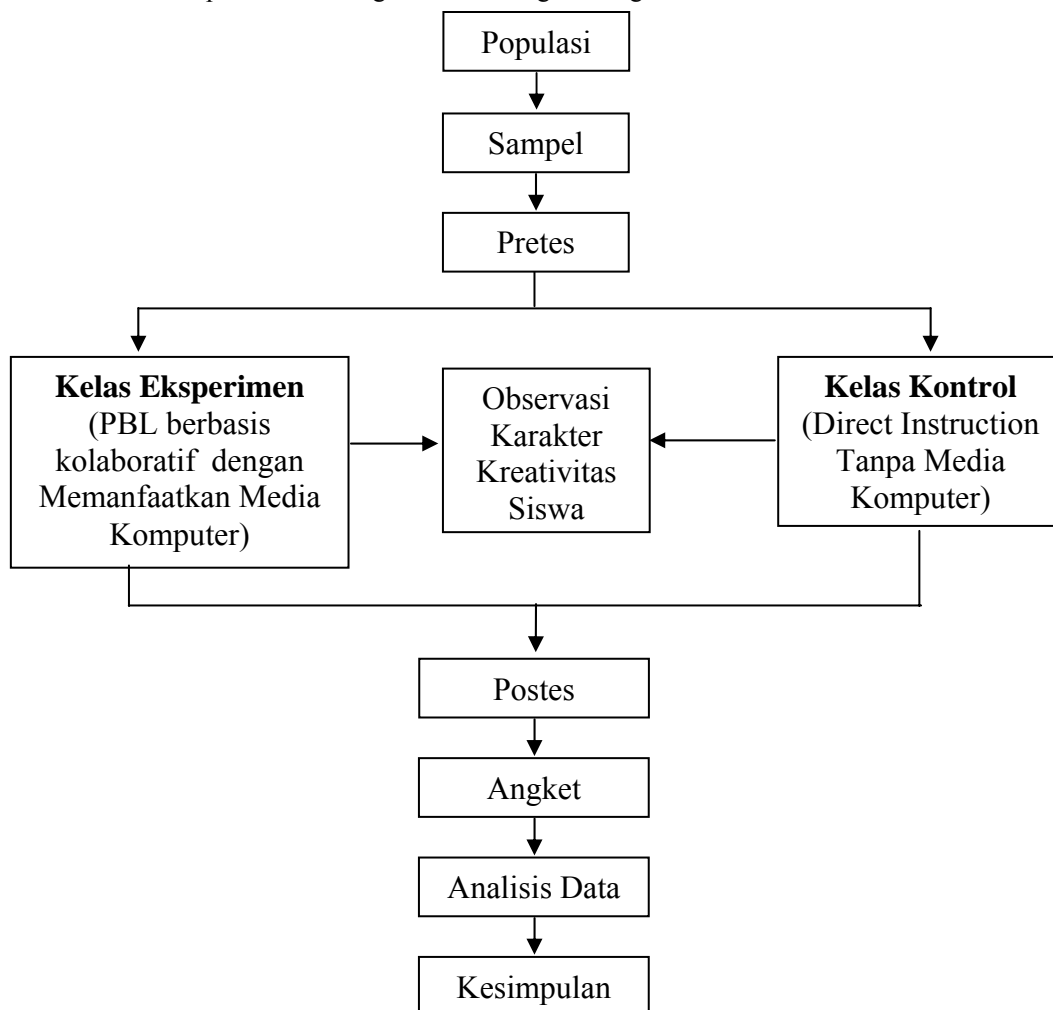
1. Kelas eksperimen yaitu kelas yang dibelajarkan dengan model *Problem Based Learning* (PBL) berbasis kolaboratif memanfaatkan media komputer
2. Kelas kontrol yaitu kelas yang dibelajarkan dengan model *Direct Instruction* tanpa media komputer.

Penelitian ini bersifat *quasi experiment* (eksperimen semu) dengan membuat perlakuan memberikan model *Problem Based Learning* (PBL) berbasis kolaboratif dengan pemanfaatan media komputer dan model pembelajaran *Direct Instruction* tanpa media komputer. Rancangan penelitian dapat dilihat pada Tabel 1 berikut.

Tabel 1 Rancangan Penelitian

Karakter Kreativitas	Model Pembelajaran	
	PBL Berbasis Kolaboratif dengan Media Komputer (A ₁)	Direct Instruction tanpa Media Komputer (A ₂)
Tinggi (B ₁)	A ₁ B ₁	A ₂ B ₁
Rendah (B ₂)	A ₁ B ₂	A ₂ B ₂

Prosedur penelitian dirangkum dalam bagan sebagai berikut:



Gambar 1. Prosedur Penelitian

Pengujian Hipotesis

Setelah prasyarat analisis data terpenuhi baik normalitas dan homogenitas data, maka dapat dilanjutkan pengujian hipotesis. Hipotesis statistik yang perlu diuji dalam penelitian ini, antara lain:

1. $H_o : \mu_{A1} = \mu_{A2}$
 $H_a : \mu_{A1} \neq \mu_{A2}$
2. $H_o : \mu_{B1} = \mu_{B2}$
 $H_a : \mu_{B1} \neq \mu_{B2}$
3. $H_o : A \gg B = 0$
 $H_a : A \gg B \neq 0$
4. $H_o : \mu_{k1} = \mu_{k2}$
 $H_a : \mu_{k1} \neq \mu_{k2}$

Keterangan:

- μ_{A1} : Hasil belajar kelompok siswa yang dibelajarkan dengan model *Problem Based Learning* (PBL) berbasis kolaboratif memanfaatkan media komputer.
 μ_{A2} : Hasil belajar kelompok siswa yang dibelajarkan dengan model *Direct Instruction* tanpa media komputer.
 μ_{B1} : Hasil belajar kelompok siswa yang memiliki karakter kreativitas tinggi.
 μ_{B2} : Hasil belajar kelompok siswa yang memiliki karakter kreativitas rendah.
 μ_{k1} : Skor karakter kreativitas siswa yang dibelajarkan dengan model *Problem Based Learning* (PBL) berbasis kolaboratif memanfaatkan media komputer.
 μ_{k2} : Skor karakter kreativitas siswa yang dibelajarkan dengan model *Direct Instruction* tanpa media komputer.

Untuk hipotesis 1, 2 dan 3 dianalisis dengan menggunakan teknik analisis varian (ANOVA) dua jalur pada data gain skordengan menggunakan bantuan program SPSS 16.0. Pemahaman konsep atau gain skor siswa dihitung menggunakan rumus *g* faktor (*gain score normalized*), sebagai berikut:

$$g = \frac{\text{skor postes} - \text{skor pretes}}{\text{skor maksimum ideal} - \text{skor pretes}}$$

Kriteria:

- | | | |
|-----------------------|-----------------|--------------|
| $g < 0,3$ | kategori rendah | |
| $0,3 \leq g \leq 0,7$ | kategori sedang | |
| $g > 0,7$ | kategori tinggi | (Hake, 1998) |

Sedangkan untuk hipotesis 4, dianalisis menggunakan uji *Independet Sampel T-Test* (uji-t) dengan bantuan program SPSS 16.0.

Kriteria pengujian hipotesis:

- Jika nilai probabilitas atau sig. > 0,05 maka H_o diterima atau H_a ditolak.
- Jika nilai nilai probabilitas sig. < 0,05 maka H_o ditolak atau H_a diterima.

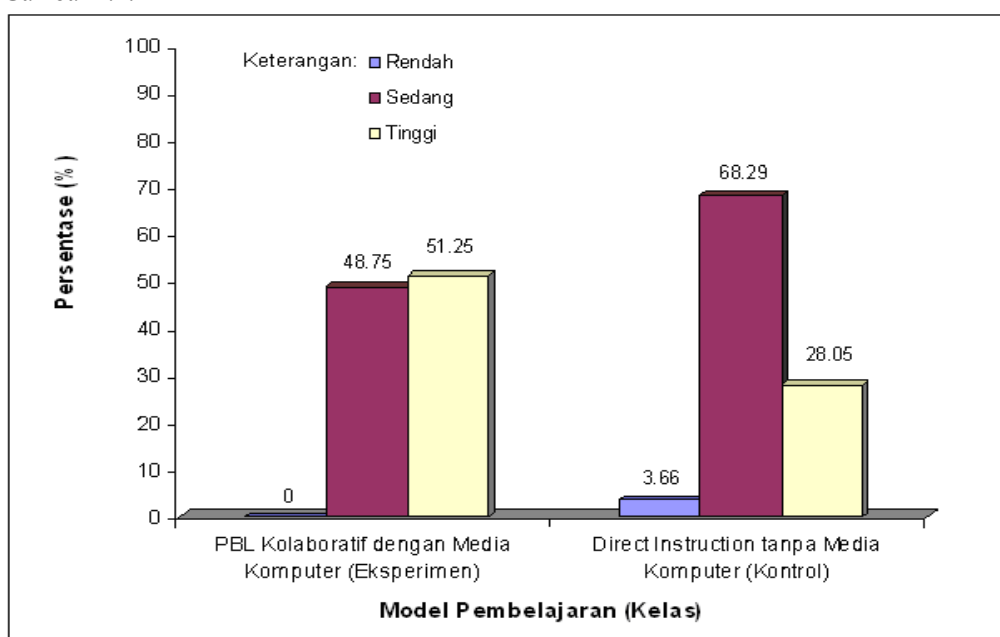
3. HASIL PENELITIAN DAN PEMBAHASAN

Berdasarkan hasil pretes dan postes dapat diketahui tingkat pemahaman siswa tentang hidrolisis garam dengan menghitung gain ternormalisasinya. Deskripsi data gain skor kedua kelas, diperlihatkan pada Tabel 2.

Tabel 2. Deskripsi Data Gain Siswa Berdasarkan Model Pembelajaran

	Kelas Model PBL Kolaboratif dengan Media Komputer	Kelas Model Direct Instruction tanpa Media Komputer
Jumlah Siswa	80	82
Rata-rata Nilai	.6974	.6052
Simpangan Baku	.14537	.14716
Nilai Terendah	.36	.25
Nilai Tertinggi	.93	.92
Jumlah Nilai	55.79	49.63

Tabel 4.3 di atas, menunjukkan bahwa gain skor (tingkat pemahaman) siswa pada materi hidrolisis garam untuk kelompok siswa yang dibelajarkan dengan model PBL berbasis kolaboratif memanfaatkan media komputer (eksperimen) diperoleh rata-rata gain sebesar 0,697 (rata-rata tergolong sedang) dengan simpangan baku 0,145. Sedangkan untuk kelompok siswa yang dibelajarkan dengan model *Direct Instruction* tanpa media komputer (kontrol) diperoleh rata-rata gain sebesar 0,605 (rata-rata tergolong sedang) dengan simpangan baku sebesar 0,147. Lebih jelasnya persentase tingkat pemahaman (gain skor) kedua kelompok siswa berdasarkan kelas atau model pembelajaran, dapat divisualisasikan pada Gambar 4.1.



Gambar 4.1. Persentase Tingkat Pemahaman (Gain Skor) Siswa Berdasarkan Model Pembelajaran (Kelas)

Perkembangan Ranah Kognitif Siswa Kelas Eksperimen

Kriteria tingkat penguasaan siswa kelas eksperimen yang dibelajarkan dengan model PBL berbasis kolaboratif memanfaatkan media komputer berdasarkan tingkat kognitif dalam menyelesaikan soal-soal materi hidrolisis garam, dilakukan dengan menganalisis setiap jawaban siswa baik dari hasil pretes maupun hasil postes dalam bentuk persentase dan selanjutnya dihitung persentase normalisasi gainnya. Secara ringkas perkembangan tingkat kognitif siswa kelas eksperimen dalam menyelesaikan soal-soal, dirangkum pada Tabel 3 berikut.

Tabel 3 Perkembangan Ranah Kognitif Siswa Kelas Eksperimen

Ranah Kognitif	Perkembangan Ranah Kognitif		
	Pretes (%)	Postes (%)	Gain (%)
C1	47,5	95,3	91,0
C2	45,0	87,2	76,7
C3	36,7	75,6	61,5
C4	24,2	70,4	60,9

Berdasarkan Tabel 3 di atas, tingkat penguasaan atau kemampuan siswa kelas eksperimen yang dibelajarkan dengan model PBL berbasis kolaboratif memanfaatkan media komputer menunjukkan bahwa aspek kognitif yang berkembang untuk C₁ dengan persentase sebesar 91% (tinggi), C₂ sebesar 76,7% (tinggi), C₃ sebesar 61,5% (sedang), dan C₄ sebesar 60,9% (sedang). Berdasarkan hasil tersebut di atas, dapat disimpulkan bahwa model PBL berbasis kolaboratif memanfaatkan media komputer (kelas eksperimen) maupun memberikan pengaruh positif dalam meningkatkan hasil belajar kimia siswa.

Hasil ANAVA dua jalur dengan bantuan program SPSS, secara ringkas diperlihatkan pada Tabel 4.

Tabel 4. Ringkasan Pengujian ANAVA Dua Jalur

Variabel Terikat: Gain Skor

Sumber	Jumlah Kuadrat	df	Rata-rata Kuadrat	F	Sig.
Model Dikoreksi	1.539 ^a	3	.513	36.387	.000
Konstanta	67.776	1	67.776	4806.629	.000
Kelas (A)	.275	1	.275	19.533	.000
Kreativitas (B)	.119	1	.119	8.431	.004
Kelas * Kreativitas	1.087	1	1.087	77.093	.000
Kekeliruan	2.228	158	.014		
Total	72.368	162			
Total Dikoreksi	3.767	161			

Berdasarkan hasil ANAVA dua jalur pada Tabel 4 di atas, diperoleh beberapa kesimpulan sebagai berikut:

Dengan melihat kolom kelas (A) diperoleh nilai F sebesar 19,533 dan nilai probabilitas atau sig. 0,000. Pada $\alpha = 0,05$; $df_1 = 1$ (df kelas) dan $df_2 = 158$ (df kekeliruan) diperoleh $F_{tabel} = 3,91$. Karena $F_{hitung} > F_{tabel}$ yaitu $19,533 > 3,91$ dan nilai probabilitas atau sig. $0,000 < 0,05$ maka H_a diterima atau H_o ditolak yang berarti hipotesis pertama diterima dan teruji kebenarannya pada taraf signifikansi atau $\alpha = 0,05$. Dengan demikian, disimpulkan bahwa terdapat perbedaan yang signifikan hasil belajar kimia antara siswa yang mendapat pembelajaran dengan penggunaan model *Problem Based Learning* (PBL) berbasis kolaboratif dengan pemanfaatan media komputer dengan siswa yang mendapat pembelajaran *Direct Instruction* tanpa media komputer.

4.2 Pembahasan Hasil Penelitian

4.3.1 Perbedaan Hasil Belajar Kimia Antara Siswa yang Dibelajarkan Model *Problem Based Learning* Berbasis Kolaboratif Memanfaatkan Media Komputer dengan Siswa yang Dibelajarkan Model *Direct Instruction* Tanpa Media Komputer

Hasil temuan penelitian, untuk siswa kelas eksperimen yang dibelajarkan dengan model PBL berbasis kolaboratif memanfaatkan media komputer diperoleh rata-rata pretes sebesar 39,06; rata-rata

postes sebesar 81,89; dan rata-rata gain skor sebesar 0,697. Sedangkan siswa kelas kontrol yang dibelajarkan dengan model *Direct Instruction* tanpa media komputer, diperoleh rata-rata pretes sebesar 32,93; rata-rata postes sebesar 74,15 serta rata-rata gain skor sebesar 0,605. Hasil pengujian hipotesis pertama dengan menggunakan ANAVA dua jalur diperoleh nilai $F_{hitung} > F_{tabel}$ yaitu $19,533 > 3,91$ dan nilai probabilitas atau sig. $0,000 < 0,05$ sehingga hipotesis pertama yang diajukan diterima dan disimpulkan bahwa terdapat perbedaan yang signifikan hasil belajar kimia antara siswa yang mendapat pembelajaran dengan penggunaan model *Problem Based Learning* (PBL) berbasis kolaboratif dengan pemanfaatan media komputer dengan siswa yang mendapat pembelajaran *Direct Instruction* tanpa media komputer. Berdasarkan rata-rata nilai postes dan gain skor menunjukkan bahwa hasil belajar kimia siswa yang dibelajarkan dengan model *Problem Based Learning* (PBL) berbasis kolaboratif memanfaatkan media komputer (rata-rata postes sebesar 81,89 dan rata-rata gain skor sebesar 0,697) lebih tinggi dibandingkan hasil belajar kimia siswa yang dibelajarkan model *Direct Instruction* tanpa media komputer (rata-rata postes sebesar 74,15 dan rata-rata gain skor sebesar 0,605).

Kesimpulan di atas, juga didukung beberapa pendapat seperti Killey (2005), yang menyatakan bahwa *Problem Based Learning* mempunyai kelebihan dalam hal membantu siswa untuk memilah masalah (*problem abstraction*), mendefinisikan masalah (*problem definition*), dan menyelesaikan masalah (*problem refinement*), membantu mengembangkan berpikir kritis, komunikasi secara lisan dan tulisan dan mengembangkan kerja kelompok. Handayani (2009), yang mengemukakan bahwa keseluruhan hasil belajar siswa dapat ditingkatkan melalui pembelajaran berbasis masalah (*Problem Based Learning*). Pendapat Mellyzar dan Silaban (2013), yang menyatakan penggunaan strategi pembelajaran lebih baik jika diintegrasikan dengan media pembelajaran yang sesuai, seperti melaksanakan praktikum laboratorium ataupun secara pengamatan melalui video yang dirangkai berbasis komputer. Kesimpulan hasil penelitian yang telah dilakukan juga diperkuat hasil penelitian yang dilakukan Zebua (2010), yang menyimpulkan bahwa penggunaan model pembelajaran berbasis masalah menggunakan media *eXe-Learning* lebih tinggi 21% dari hasil belajar siswa tanpa menggunakan media *eXe-Learning*.

Hasil temuan di lapangan, selama proses pembelajaran di dalam kelas, menunjukkan bahwa secara keseluruhan model PBL berbasis kolaboratif memanfaatkan media komputer menjadikan siswa lebih aktif dalam proses pembelajaran, mulai dari memahami masalah yang diajukan guru dalam bentuk LKS, merumuskan masalah, melakukan penyelidikan atau praktikum untuk memecahkan masalah yang ada hingga menarik kesimpulan dari hasil praktikum yang telah dilakukan. Dengan memanfaatkan media komputer *eXe-learning* dan slide *PowerPoint*, siswa juga dapat mengerti, memahami dan mengingat materi yang disampaikan oleh guru dengan mudah. Selama proses pembelajaran siswa juga tampak aktif berdiskusi dan bertanya serta mengerjakan soal-soal yang diberikan guru. Proses pembelajaran dengan menerapkan model PBL berbasis kolaboratif memanfaatkan media komputer juga menjadikan belajar siswa jadi menyenangkan, siswa juga tampak kreatif dalam mengemukakan ide atau pendapatnya tentang materi yang dipelajari.

Sementara kelompok siswa yang dibelajarkan dengan model *Direct Instruction* tanpa media komputer, selama proses pembelajaran siswa lebih banyak pasif dan diam dengan hanya mendengarkan dan memperhatikan penjelasan guru di depan kelas. Proses pembelajaran hanya berjalan satu arah dari guru sebagai pemberi materi kepada siswa sebagai penerima materi. Kegiatan pembelajaran juga lebih didominasi oleh kegiatan guru (berpusat pada guru) dalam menyampaikan materi pelajaran. Selama proses pembelajaran siswa hanya aktif mendengarkan, mencatat hal-hal penting dari penjelasan guru di depan kelas, kemudian mengerjakan tugas-tugas yang diberikan guru secara individual atau mandiri. Beberapa siswa juga tampak kurang semangat mengikuti pembelajaran yang berlangsung dan lebih terfokus membuat catatan dan hafalan saja.

Berdasarkan hasil dan temuan-temuan penelitian yang diperoleh, maka dapat diindikasikan bahwa penerapan model *Problem Based Learning* (PBL) berbasis kolaboratif memanfaatkan media komputermemberikan pengaruh yang lebih baik dalam meningkatkan hasil belajar kimia siswa dibandingkan model *Direct Instruction* tanpa media komputer. Dengan demikian, berdasarkan hasil

penelitian yang telah dilakukan diperoleh bahwa hasil belajar kimia siswa yang dibelajarkan dengan model *Problem Based Learning* (PBL) berbasis kolaboratif memanfaatkan media komputer lebih tinggi dibandingkan siswa yang dibelajarkan dengan model *Direct Instruction* tanpa media komputer.

4. KESIMPULAN

Berdasarkan hasil temuan penelitian, analisis data dan pengujian hipotesis, maka dapat diambil beberapa kesimpulan sebagai berikut:

Terdapat perbedaan yang signifikan hasil belajar kimia antara siswa yang mendapat pembelajaran dengan penggunaan model *Problem Based Learning* (PBL) berbasis kolaboratif dengan pemanfaatan media komputer dengan siswa yang mendapat pembelajaran *Direct Instruction* tanpa media komputer dengan nilai $F_{hitung} > F_{tabel}$ yaitu $19,533 > 3,91$ dan nilai probabilitas atau Sig sebesar $0,000 < 0,05$. Hasil belajar kimia siswa yang dibelajarkan dengan model *Problem Based Learning* (PBL) berbasis kolaboratif memanfaatkan media komputer lebih besar dibandingkan hasil belajar siswa yang dibelajarkan *Direct Instruction* tanpa media komputer.

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MENDESAIN PEMBELAJARAN KEMAGNETAN MELALUI *LEARNING COMMUNITY*

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Abstrak: Pembelajaran magnet di sekolah dasar (SD) diawali dengan guru menunjukkan sifat magnet memiliki dua kutub, utara dan selatan, dan diakhiri dengan pembuatan magnet. Namun, dalam pembuatan magnet guru tidak menghubungkan dengan sifat magnet yang memiliki dua kutub. Melalui *learning community* (LC), guru-guru SD mendesain pembelajaran tentang magnet dan sifat-sifat magnet yang dibuat. Penelitian ini dilakukan di Kota Surakarta pada kelompok *Lesson Study* berbasis KKG. Desain pembelajaran yang dihasilkan dari LC ini adalah: 1) guru menemukan kutub magnet buatan berlawanan kutub magnet permanen; 2) magnet dapat dibuat dengan cara mendekatkan, menempelkan, menggosok dengan magnet permanen; 3) magnet juga dapat dibuat dengan elektromagnet. Dampak lain dari LC adalah guru mendapatkan pengalaman baru dalam melakukan pembelajaran magnet berdasarkan hasil pemikiran bersama dengan guru lain. Peserta LC juga mendapatkan manfaat bahwa kegiatan saling memberi, saling menerima, saling menghargai antar guru akan meningkatkan profesionalitasnya.

Kata kunci: pembuatan magnet, elektromagnet, profesionalitas guru SD.

1. PENDAHULUAN

Pembelajaran di Indonesia memiliki karakteristik spiral berkembang. Substansi materi yang dipelajari di sekolah dasar akan ditemukan lagi ketika belajar di sekolah Menengah Pertama dan sekolah menengah atas. Semakin ke atas jenjang pendidikannya, semakin mendalam dan meluas. Mahasiswa Pendidikan Fisika FKIP UNS yang inputnya dari siswa-siswa SMA sudah memiliki bekal pengetahuan yang baik, karena memiliki tingkat keketatan 1:12 (tahun 2015). Ini menunjukkan kualitas mahasiswa yang masuk ke Prodi Pendidikan Fisika UNS merupakan bibit unggul dalam pengetahuannya. Namun, pada saat mengikuti perkuliahan fisika dasar pada substansi materi kemagnetan, teridentifikasi banyak kesalahan, dan baru berubah setelah dilakukan perbaikan melalui eksperimen langsung dengan magnet. Kesalahan ini perlu untuk dilacak sumber permasalahan tentang kemagnetan ini, salah satunya adalah guru.

Kompetensi yang diharapkan dari proses pembelajaran kemagnetan di sekolah menengah pertama adalah Menerapkan konsep kemagnetan, induksi elektromagnetik, dan pemanfaatan medan magnet dalam kehidupan sehari-hari termasuk pergerakan/navigasi hewan untuk mencari makanan dan migrasi dan Membuat karya sederhana yang memanfaatkan prinsip elektromagnet dan/atau induksi elektromagnetik. Kompetensi ini berbeda dengan pembelajaran kemagnetan di SMA. Namun, fakta yang ada di sekolah menunjukkan tidak ada perbedaan pembelajaran kemagnetan di SMP dan SMA. Sedangkan di sekolah dasar, memiliki kompetensi yang berbeda yaitu mengidentifikasi sifat-sifat magnet dalam kehidupan sehari-hari dan membuat laporan hasil percobaan tentang sifat-sifat magnet dan penerapannya dalam kehidupan sehari-hari.

Ditemukan permasalahan pada mahasiswa prodi pendidikan fisika UNS yaitu, 1). arah mata angin. Banyak mahasiswa tidak responsif dengan arah mata angin, sehingga ketika diberi informasi suatu tempat arahnya di sebelah utara, selatan, timur atau barat, memberi argumen "saya tidak tahu". Orientasi arah yang familier bagi anak adalah kiri-kanan dan atas bawah. 2). kutub magnet, selalu terjadi keterbalikan antara kutub utara dan selatan. 3) cara membuat magnet terdiri dari induksi, menggosok, dan elektromagnet, namun tidak pernah bisa menunjukkan kutub magnet yang terbentuk, yang penting dapat menarik paku.

Berdasarkan keadaan ini, perlu ditinjau proses pembelajaran kemagnetan di Sekolah Dasar. Peninjauan ini dilakukan terhadap perangkat pembelajaran guru. Hasil peninjauan menunjukkan pembelajaran kemagnetan sudah dilengkapi dengan praktik (benda-benda yang ditarik magnet, dan elektromagnet). Sedangkan kegiatan praktik tidak didukung dengan proses penulisan data dan analisisnya,

namun pemberian informasi tentang magnet, yang lepas dari hasil percobaan. Berdasarkan hasil identifikasi ini dilakukan perancangan/redesain ulang pembelajaran kemagnetan bagi siswa sekolah dasar.

2. METODE PENELITIAN

Jenis penelitian yang dilakukan ini adalah deskriptif kualitatif. Penelitian deskriptif kualitatif adalah suatu metode dalam meneliti status sekelompok manusia, suatu objek dengan tujuan membuat deskriptif, gambaran atau lukisan secara sistematis, faktual dan akurat mengenai fakta-fakta atau fenomena yang diselidiki (Cevilla, 1993). Penelitian ini dilakukan di kelompok kerja guru (KKG) sekolah dasar Kleco 1 Kota Surakarta tahun 2016. Kegiatan mendesain pembelajaran kemagnetan ini dilakukan kerjasama antara mahasiswa S2 PGSD UNS dan KKG SD Kleco 1.

3. HASIL PENELITIAN

Guru merasa tidak memiliki masalah dengan pembelajaran magnet. Menurut guru, pembelajaran kemagnetan selama ini dilakukan di kelas aman-aman saja, tidak ada pertanyaan yang tidak bisa dijawab oleh guru. Demikian juga soal-soal yang berkaitan dengan magnet dapat dijawab dengan mudah oleh siswa. Untuk membelajarkan kemagnetan guru sudah hafal materinya, sehingga dapat dilakukan dengan satu kali pertemuan setelah itu latihan soal-soal. Namun ketika ditanya tentang "apakah siswa dapat memanfaatkan konsep mata angin dalam kehidupan sehari-hari?". Guru menjelaskan sudah menjadi biasa anak sekarang tidak menggunakan mata angin untuk menentukan arah atau posisi suatu tempat. Anak menggunakan arah kiri dan kanan untuk menjelaskan posisi suatu benda dilihat dari arah yang lain.

Penggunaan kompas untuk menentukan arah mata angin sudah diketahui oleh guru, tetapi ternyata ada keterbalikan. Menurut guru, kutub utara kompas adalah ujung kompas yang menghadap ke selatan, sedangkan kutub selatan kompas adalah ujung kompas yang menghadap ke utara. Hal ini disebabkan jarum kompas tidak ada tulisan U atau N dan S, yang mengidentifikasikan arah Utara dan Selatan. Tulisan U dan S ada di dalam bodi atau dasar kompas adalah mata angin yang sesungguhnya.

Kegiatan yang dilakukan untuk memperbaiki konsep arah ini dilakukan dua cara. Pertama, penggunaan jembatan analogi antara nama kutub dan nama ujung. Sinonim kutub adalah ujung, pulau Jawa yang membujur ke arah timur-barat memiliki daerah yang bernama Ujung Kulon yang letaknya di Banten/Jawa Barat, maka kutub yang menghadap ke utara adalah kutub utara magnet. Kedua, menggunakan magnet yang sudah ada tulisan U – S dan digantung dengan seutas benang. Ujung magnet U menghadap ke utara, berarti kutub utara magnet, demikian juga sebaliknya.

Fakta lain yang ditemukan dari kegiatan penyusunan perangkat pembelajaran kemagnetan adalah, penggunaan istilah yang tidak dapat di-konkritkan. Guru menjelaskan sifat magnet berdasarkan kekuatannya dibagi menjadi feromagnetik, paramagnetik dan diamagnetik, namun tidak dapat menunjukkan secara kongkrit sifat paramagnetik dan diamagnetik. Pembelajaran sifat magnet ini hanya diinformasikan saja, agar siswa hafal istilah-istilah IPA, tanpa mengetahui fakta real.

Pembuatan magnet yang dilakukan guru adalah elektromagnet, yaitu melilitkan kawat tembaga ber-email yang dialiri arus listrik ke batang paku dan didekatkan ke paku-paku kecil. Hasilnya paku-paku kecil akan menempel ke elektromagnet, tidak dilihat kutub yang terjadi. Sedangkan membuat magnet dengan cara menggosok dan induksi tidak dilakukan karena sudah dijelaskan pada buku pelajaran. Membuat magnet dengan cara ini sangat mudah sehingga tidak pernah dilakukan dengan siswa. Namun setelah dilakukan percobaan, banyak pengalaman yang belum diperoleh sebelumnya, misalnya kutub magnet yang terbentuk.

Diskusi

Kegiatan mendesain pembelajaran ditemukan guru memiliki kesalahan dalam awal dalam menentukan kutub nama kutub magnet. Kutub magnet yang menghadap ke utara geografis oleh guru dinamakan kutub selatan, sedangkan kutub magnet yang menghadap ke selatan geografis dinamakan kutub utara. Kesalahan pemberian nama kutub ini disebabkan karena pencampuran konsep antara kutub magnet dengan kutub geografis. Guru memberikan argumen bahwa kutub senama tolak-menolak, kutub

tidak senama tarik menarik. Ada kata yang hilang yaitu kutub magnet, sehingga dalam pemikiran guru yang berhadapan dengan kutub utara adalah kutub selatan, sehingga kutub magnet yang menghadap ke utara adalah kutub selatan. Kesalahan ini diperbaiki dengan menggunakan jembatan analogi (Clement, 1993).

Jembatan analogi adalah penggunaan fakta kongkrit sebagai penghubung untuk mengungkap sebuah konsep yang abstrak. Kata yang sepadan dengan kutub adalah ujung. Dianalogikan nama daerah di pulau Jawa yaitu Ujung Kulon. Ujung Kulon terletak di pulau Jawa di ujung barat (kulon), sehingga nama daerah tersebut adalah Ujung Kulon. Menggunakan analogi ini, ujung magnet yang menghadap ke utara dinamakan kutub magnet utara. Kata kutub magnet harus ditambahkan agar ada perbedaan dengan kutub geografis. Ini menunjukkan kekhasan guru sekolah dasar, yang harus menggunakan kata sederhana dan lugas, serta menghindari kata-kata yang bermakna ganda.

Guru sekolah dasar hafal ada 3 cara dalam membuat magnet, yaitu: induksi, menggosok, dan elektro magnet. Induksi dalam pengertian guru ada dua: Pertama, besi ditempelkan pada salah satu kutub magnet, maka besi akan mengalirkan kemagnetannya sehingga besi menjadi magnet dan dapat menarik paku-paku kecil disekitarnya. Kedua, mendekatkan magnet ke benda bukan magnet, dan menyebabkan benda itu menjadi magnet. Jika magnet penginduksi dijauhkan, sifat kemagnetannya akan hilang. Membuat magnet dengan cara menggosok, sebagaimana dalam buku pelajaran SD, harus digosok searah agar menjadi magnet. Jika digosok bolak-balik maka tidak akan menjadi magnet, disebabkan gosokan yang berlawanan akan menyebabkan kemagnetan yang terbentuk di awal mengalami kerusakan. Sedangkan untuk membuat elektromagnet harus menggunakan email kawat tembaga. Kawat email dililitkan pada paku, maka paku akan menjadi elektromagnet.

Guru memaknai buku secara tekstual, tidak pernah menguji untuk mendapatkan fakta kongkrit. Informasi dalam buku selalu dianggap benar, dan tidak dilihat penulisnya. Guru juga tidak membedakan antara buku teks, buku pelajaran, modul, bahkan Lembar Kerja Siswa (LKS) juga dianggap buku. Guru tidak menyangsikan lagi kebenaran di dalam buku, dan merasa tidak perlu menguji lagi informasi dalam buku tersebut. Pengalaman beberapa guru yang melakukan percobaan seperti dalam buku, tetapi hasilnya berbeda, selalu dikatakan percobaannya gagal. Guru menyalahkan percobaannya sendiri, tanpa berusaha mencari tahu penyebab perbedaan hasil yang diperoleh. Guru tidak percaya diri dengan perbedaan yang terjadi. Berbekal dari pengalaman kegagalan tersebut, guru lebih memilih menginformasikan isi buku kepada siswa dari pada harus bersusah payah menyiapkan alat, melakukan percobaan dengan resiko gagal, waktunya panjang, hasil maksimumnya sama dengan informasi dalam buku. Akhirnya pilihan yang paling menarik dari para guru adalah menginformasikan substansi materi dalam buku kepada siswa. Ini yang menyebabkan kurangnya inovasi pembelajaran khususnya materi kemagnetan.

Kegiatan praktik yang dilakukan guru selama ini bersifat verifikasi. Praktik membuat magnet dengan cara apapun, indikator hasil pembuatan magnet adalah "mampu menarik paku-paku kecil". Padahal paku yang sudah terinduksi maka akan menjadi magnet, sehingga ketika didekati besi lain yang bukan magnet juga dapat menempel. Guru belum berfikir tentang kutub magnet sebagai indikator magnet yang diperoleh dari percobaan. Ini menunjukkan kegiatan praktik sebagai pelengkap pembelajaran, belum menempatkan kegiatan praktik sebagai proses inkuiri. Inkuiri menempatkan kegiatan praktik merupakan sebuah proses untuk mendapatkan pengetahuan. Apapun hasil dari kegiatan praktik adalah temuan yang perlu diapresiasi.

Guru menunjukkan pemikiran yang inovatif ketika dilatih dan didampingi dalam mendesain pembelajaran. Kemampuan guru dalam membuat skenario pembelajaran menjadi lebih baik ketika diawali dari pengalaman praktik kongkrit dibanding hanya membaca buku atau menggunakan hafalan yang dimiliki sebelumnya. Fakta yang terjadi selama ini, guru tidak mengawali penyusunan perangkat pembelajaran dengan melakukan percobaan lebih dahulu. Perangkat pembelajaran lebih banyak untuk kepentingan administrasi, bukan sebagai desain skenario pembelajaran yang akan dilakukan. Bahkan, beberapa oknum guru tidak menyusun perangkat pembelajaran sendiri tetapi mengcopy perangkat pembelajaran orang lain. Sangat sedikit perangkat pembelajaran yang disusun guru direview oleh teman sesama guru, baik melalui sebuah forum atau inisiatif pribadi guru.

Penyusunan perangkat pembelajaran akan lebih bagus lagi jika disusun dari hasil kegiatan guru dalam forum kelompok kerja guru (KKG). Menurut Suhardi (2009:7) KKG berfungsi sebagai wadah pembinaan profesional guru SD dalam bentuk kegiatan pembinaan profesional, wahana menumbuhkembangkan semangat kerjasama dalam rangka meningkatkan proses dan hasil belajar siswa, penumbuh rasa percaya diri dalam menyelesaikan tugas dan kewajiban akademik. Kegiatan KKG selama ini lebih kepada menggugurkan kewajiban dibanding muncul dari hati nurani untuk meningkatkan profesionalisme. Pengawas dalam forum KKG lebih banyak menginformasikan kebijakan dinas pendidikan dibanding memberi bantuan terhadap permasalahan pembelajaran di kelas. Berkumpulnya banyak guru dalam forum KKG belum diikuti dengan kegiatan mengungkap permasalahan pembelajaran di kelas, upaya nyata untuk memecahkan permasalahan pembelajaran, dan menyusun perangkat pembelajaran yang akan digunakan dalam memecahkan permasalahan permasalahan tersebut akan membangun sebuah komunitas pembelajaran (*learning community*).

Komunitas pembelajaran adalah sebuah organisasi yang anggotanya mengembangkan kapasitasnya secara terus menerus untuk mencapai hasil yang diinginkan, mendorong pola berpikir yang baru dan luas, dan terus belajar cara belajar bersama-sama (Senge, 1990). Sebuah komunitas pembelajaran memiliki konsep bahwa belajar sepanjang hayat merupakan aktivitas dasar setiap individu dan warga sekolah secara keseluruhan. KKG sebagai organisasi pembelajar melakukan kegiatan untuk pengembangan kompetensi pedagogik dan profesional guru. Sesama guru dalam forum KKG bersama-sama saling berbagi, menghargai, dan meningkatkan kualitas proses pembelajaran. Melalui kegiatan ini, penyusunan perangkat pembelajaran dapat dijamin kualitasnya.

4. KESIMPULAN

Desain pembelajaran yang dihasilkan dari LC ini adalah: 1) guru menemukan kutub magnet buatan berlawanan kutub magnet permanen; 2) magnet dapat dibuat dengan cara mendekatkan, menempelkan, menggosok dengan magnet permanen; 3) magnet juga dapat dibuat dengan elektromagnet. Dampak lain dari LC adalah guru mendapatkan pengalaman baru dalam melakukan pembelajaran magnet berdasarkan hasil pemikiran bersama dengan guru lain. Peserta LC juga mendapatkan manfaat bahwa kegiatan saling memberi, saling menerima, saling menghargai antar guru akan meningkatkan profesionalitasnya.

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**THE IMPLEMENTATION OF LESSON STUDY IN IMPROVING STUDENT'S INDEPENDENT
LEARNING THROUGH REFERENCES MULTIPLICATION IN MATHEMATICS
DEPARTMENT IN UNIVERSITY OF MUHAMMADIYAH GRESIK**

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Abstract: Problems in the learning system of the freshmen (first semester), which is a transition era from school to college, have an independence constraints in their learning. The purpose of this study is to increase the students' activities and learning achievement in the subject of 'Education Platform' using 'Lesson study' through the multiplication of reference. This research is a classroom action research carried out with Lesson study and conducted in four cycles. The results showed that the readiness / modalities students have started to appear in the second cycle, including the readiness of study appears to have adaptive learning for students to the strategies employed, this condition is increasing in the third and fourth cycles. The multiplication of references used as a learning resource in the third cycle makes the achievement of student learning gradually improved although not in ideal condition. The use of references from the Internet increasingly dominates in the fourth cycle. In the third and fourth cycle, there are more changes in students in terms of learning, especially in the process of presentation and discussion. As of the fourth cycle, we recently showed the quantitative fact of learning outcomes and not qualitatively the acquisition of knowledge can be seen well. Nevertheless, it quantitatively showed the increasing numbers of students who are active and use the book as the basis of their knowledge, assumed to have been an increase in independent learning that tip ends until the achievement of student learning is essential. The fact about the increase of students' readiness / modalities is because of an increased awareness and gradual loss of excessive reliance on teachers, their readiness to learn is also better in terms of quantity of students in the class, enjoy and not rigid in the presentation of group discussions is compelled by the readiness of prior knowledge sourced from reference multiplication used as a learning resource.

Keywords: lesson study, independent learning, the multiplication of reference, learning outcomes

1. INTRODUCTION.

The success of learning is a desire for students, parents, faculty, colleges, communities, and even countries. However, to achieve a good learning is not as simple as turning the hand, but require a process. Learning difficulties experienced by students during the learning process is a reality that cannot be avoided. Lasan (2012) mentioned it as learning difficult, an obstacle to achieve maximum learning results. One of the students' learning difficulties is the 'independent learning'.

Three terms related to independent learning is self-regulated learning (SRL), self-regulated thinking (SRT), and self-directed learning (SDL). Some characteristics in common include: the process of designing and monitoring the cognitive and affective processes when a person completes his/her academic duties.

The discussion of independent learning term associated with several other terms of which are self-regulated learning, self-regulated thinking, self-directed learning, self-efficacy and self-esteem. The meaning of the five terms above are not exactly the same, but they might have some characteristics in common. In the sixties and seventies, education practitioners were influenced by behaviorism view like Watson and Skinner. Then continued by the views of social learning theory of Bandura, who viewed learning from a cognitive standpoint. Long (Kerlin, 1992) for instance, viewed learning as a cognitive process that is influenced by several factors such as the individual circumstances, prior knowledge, attitudes, individual views, content, and manner of presentation. One important sub-factor of individual circumstances that influences learning is self-regulated learning (SRL).

Corno and Mandinah (1983), Hargis (<http://www.jhargis.co/>) and Kerlin, (1992) defined SRL as an effort to deepen and manipulate the associative network in a particular field, and monitor and improve the process of deepening. The definition showed that SRL is a process of designing and self-monitoring

towards the cognitive and affective processes in completing an academic task. SRL itself is not a mental ability or academic skills such as reading fluency, but it is a process of self-direction in transforming the mental ability in certain academic skills (Hargis, <http://www.jhargis.co/>).

Somewhat different from the Corno and Mandinach, Bandura (Hargis, <http://www.jhargis.co/>) defined the SRL as the ability to monitor own behavior, and is a hard-working human personality. Furthermore, Bandura suggested three steps in implementing SRL: (1) Observing and supervising own self; (2) Comparing own position to a certain standard, and (3) Providing own response (a positive response and negative response). SRL strategy includes the following activities: evaluating self, organizing and transforming, setting goals and design, searching for information, recording and monitoring, preparing the environment, looking for own consequences, repeating and remembering, seeking social assistance, and reviewing the records. In connection with SRL, Hargis (<http://www.jhargis.co/>) reported that students demonstrated a high SRL when learning science through the internet, and they gained improved score after learning. Similarly Yang (Hargis, <http://www.jhargis.co/>) reported that students who have a high SRL: (1) tend to learn better in their own oversight than under the supervision of the program, (2) are able to monitor, evaluate, regulate their learning effectively; (3) save time in completing tasks; and (4) organize the study and time efficiently.

Similar to the definition of Bandura which is associated with self-control in learning, Schunk and Zimmerman (1998) defined the SRL as a learning process that occurred due to the influence of thoughts, feelings, strategies, and behavior which are oriented to achieving goals. According to Schunk and Zimmerman (1998), there were three main phases in the SRL cycle: designing the learning, monitoring the learning progress during implementing the design, and evaluating the results of the study completely. Similar to Schunk and Zimmerman (1998), Butler (2002) stated that the SRL is a recursive cognitive activities cycle (repeatedly) that includes the following activities: analyzing the task; selecting, adopting, or finding a strategic approach to achieve the purpose of the task; and monitoring the results of the strategies that have been implemented. Rochester Institute of Technology (2000), identified some other characteristics in SRL: selecting the learning objectives, considering difficulties as challenges, selecting and using available resources, in collaboration with others, constructing meaning, understanding the attainment of success is not enough just by ability, but must be accompanied by self-control.

Another term related to SRL, stated by Lowry (ERIC Digest No. 93, 1989), which is self-directed learning (SDL): defined as a process in which the individual: initiatively learn with or without the help of others; diagnose their own learning needs, formulate learning goals; identify learning resources that can be used; select and implement learning strategies, and evaluate learning outcomes. Another definition of self-direction on learning or SDL is stated by Wongsri, Cantwell, Archer (2002) which is a learning process in which individuals have a sense of responsibility in: designing, implementing and evaluating the learning process. The above definition describes the internal characteristics where individual directs and focus on their own learning, as well as taking responsibility for their learning. Wongsri, Cantwell, Archer (2002) argued that the ability of SDL should be maintained by each individual who mainly follow tertiary education (higher education). The meaning of SDL in which individuals actively regulate their learning process, is an internal process that is owned and carried out by individuals who are learning. Individuals ability in maximizing SDL is not a talent, but can be enhanced through relevant learning programs. Hoban, Sersland, Raine (Wongsri, Cantwell, Archer, 2002) related the term of SDL to the term of self-efficacy which is defined as an individual view towards their ability in certain academic fields. The view of individual self-efficacy influences the selection and lectures they follow. That situation illustrates that basically individuals are active participants in their learning. Furthermore, Hoban, Sersland, Raine (Wongsri, Cantwell, Archer, 2002) stated that self-efficacy is related to SDL, achievement objectives in learning, attribution, SRL, and volition. In their study, it was found that students who have a high degree of self-efficacy demonstrated high degree of SDL.

The learning process in a person included in students is a complex thing, students who determine whether or not the learning happens on them, so that students are required to be active and independent in their learning. The embodiment of good learning can be seen from the learning activities. Besides

learning activities, academic achievement is also influenced by independent learning. Independent learning is an important element. Independence emphasizes on students' activity in learning in full responsibility for the success of learning. To enhance the independence of the students could be fostered by the provision of task. The tasks from lecturers are designed to be independently done by students, to train the mind and the existing learning resources, which are from reference books, both main and additional which students use in enriching their knowledge.

Based on our observations in the classroom, it showed the fact that most university students are still very dependent on the lecturer. Habit from the previous school levels is still strongly felt, thus we applied the lesson study on the first semester students of 2014/2015. The dependence of students on the lecturers in learning can be seen in the third meeting of the fourteen meetings designed, which was no learning resources such as books and major reference found owned and read by students in preparing their learning process in the classroom. This also gives us confidence that the independent learning which should have been formed on the student seems to have not occurred.

Different from the description above, the learning process should be developed to boost students' capacity power and independence in learning. Students with high independence are able to learn without the help of others, while students with lower independent learning is in need of others in the study. On the use of lesson study, the learning was designed to encourage student activities maximally and facilitate the independent learning by utilizing many references in analyzing the concept of the tasks. Thus, the approach in the learning process that is used to stimulate the students are able to solve problems that arise in the process of learning, considering that learning achievement is a reflection of the effort to learn, the better the effort of learning, the better the achievement. The learning achievement can be used as an indicator of success in learning, where good learning achievement will be achieved by the students who can overcome learning difficulties and have inadequate learning resources.

2. RESEARCH METHODS.

Classroom Action Research (CAR) is conducted in order to improve the learning outcomes by improving student activities and independence in learning. The approach used in this study is qualitative descriptive. The classroom action research was conducted in four cycles, each cycle consists of four phases include planning, implementing, observing and reflecting, which is simultaneously closed with the phase of the lesson study. In each implementation of the Lesson Study consists of three stages: plan, do, and see.

The subjects were 38 students of the first semester of Mathematics Education in University of Muhammadiyah Gresik. Then, the data collected through the observation made by 3 observers, on students' activities during the learning process by basing on the SRL activities phase explained by Schunk and Zimmerman (1998), as follows:

1. Observing phase on students learning includes students' readiness / modalities in task analysis stage, understanding the learning objectives set, and adaptable to the design of learning strategies.
2. Observing and monitoring phase on students' flexibility in their participation in the use of learning approaches and strategies conducted by a lecturer who refers to the Student Centre Learning (SCL), the use of initiation and creativity in solving problems in learning and the use of learning resources.
3. Observing and monitoring phase on the evaluation of the activity and readiness to learn (evaluation process) and student learning outcomes (product evaluation) including the improvement of learning outcomes (the purpose of) during the learning process.

3. RESULTS AND DISCUSSION.

Based on the results of the observations made by the lecturer of the course, there was a fact that generally students do not have good readiness and independent learning yet. This is possible because they are still in transition after high school level, so the tendency to rely on the lecturers is very real. Lesson study, as learning way that will be used for four cycles, is agreed to lift the development of students' independent learning as the focus and then used as a basis for planning classroom action research.

The First Cycle.

On the learning implementation of the first cycle (do), in accordance with the plan agreed that learning with the analytical approach to the problem provided by lecturers with the help of learning resources such as main and additional references could not be conducted well, considering the inexistence readiness of students to the availability of reference. During the learning process recorded in observation, students tend to solve problems based on sober knowledge they have and relatively not based on the strong theory. Then, the interpretive reflection of the observation process (see) are shown in Table 1, found the following things:

1. Readiness / modalities possessed by students in the form of prior knowledge related to education is relatively small, so the lecturer was forced to dominate the learning activities.
2. Flexibility of learning readiness regards to the adaptation of strategies employed by lecturers, students still tend to be rigid and not ready for independent learning pattern, so that the creativity in meeting the knowledge does not appear.
3. The learning achievement by problem analysis cannot be done by the students yet, because there is insufficient learning resources possessed by students, thus forcing the lecturer having more explanation with little question improvisation.

The above reflections can conclude on the need of a plan in cycle 2 which has more emphasis on student activity within the group and providing a longer time, so it can be used to prepare better initial modality.

Table 1
The Implementation of SRL Phase Cycle 1

SRL Phase	Indicator	Observation Result
Designing learning,	- Modality of study - Readiness to learn	Readiness of student learning is passive, it seemed depend entirely on the lecturer. The prior modalities of the students as entry behavior is not sufficient as prior knowledge that can encourage student-centered learning, thus forcing the teacher-centered learning.
Monitoring the progress of learning	- Initiation - Creativity - Learning Resources	Initiation in the form of initial ideas or opinions based on the prior knowledge as an indicator of learning outcome progress is not apparent yet. This causes the actualization of knowledge as a form of student creativity in independent learning cannot exist. Learning is dominated by lecturers with the aim to walk a little improvisation through questions and answer which produces answers based on the sober knowledge and experience not from the conceptual framework. The stagnant condition is caused due to the absence of adequate learning resources used by the student.
Evaluating the results of the study completely	- Goal among - Learning outcome	The students learning achievement is the practical and not the result which is created independently by students.

The Second Cycle.

On the learning implementation of the second cycle (do), according to the plan that has been designed by referring the reflection in cycle I, that learning with the analytical approach to the problem provided by lecturers is conducted by giving the task in groups and can be completed outside the instructional classroom hours, so in the 'do' stage, the model used is the presentation of the problem analysis result. In the second cycle, there has been little change in student readiness, so that the learning activities are starting to show a pattern of independence, although not significant. Learning resources in the form of a primary reference has owned by a number of students, while additional references are still not widely owned. The learning process, especially the presentation is starting to look students' readiness which has been obtained from their own sources, but the comprehensive understanding was not achieved yet. The observation result showed that students were not free to present the results of the study and theory and without any improvisation, especially in the presentation of the results.

Further interpretive reflection of the observation process (see) are shown in Table 2, it found the data concerning on the students' readiness / modalities started to appear, readiness to learn is also better, because it seems that students were adaptive towards the strategies employed, the insufficient references are used as a source of learning makes student learning outcomes have not been up and even still largely waiting. Thus, it is recommend for learning in cycle 3 to use the second cycle design with an emphasis on the multiplication of the references used in solving problems prepared by lecturers.

Table 2
The Implementation Of SRL Phase Of The Second Cycle

SRL Phase	Indicator	Observation Result
Designing learning,	- Modality of study - Readiness to learn	Students learning readiness has been better than in the first cycle, it is apparent from the initial exposure of students in task analysis conducted by lecturer. The students' prior modalities as entry behavior adequately describe the prior knowledge which is expected to encourage student-centered learning, this is due to the provision of sufficient time for students towards the discussion activities outside the classroom for 2 weeks.
Monitoring the progress of learning	- Initiation - Creativity - Learning Resources	Initiation began to appear in some students, especially the group leader and a small portion of students who had the opportunity to prepare the material, though some other students are still waiting. Many students have not been involved directly in the preparation of the material within group which causes undeveloped class creativity. Rigidity in response is relatively very visible on most students possibly because they didn't read many references. The knowledge acquisition happens to some students only, even the actualization of knowledge that will produce creativity is still some distance away.
Evaluating the results of the study completely	- Goal among - Learning outcome	The process of knowledge formation has begun due to grouping strategy and problems administration in students, although uneven and still at the surface level. Critical power expected to emerge as a result of the provision of the analyzed problem is not visible.

The Third Cycle.

On the learning implementation of the third cycle (do), the second cycle recommendations solidify the learning plan to use student grouping system and give enough time to the students, as well as the use

of more comprehensive references. The analytical approach to the problem provided by the lecturer is seen as the appropriate choice towards the effort of students' comprehension independently. In the third cycle, there were more and more changes to the readiness of students in terms of learning. Increased references used as a material analysis led to an independence improvement, it can be seen physically students are no longer rigid and feel enjoy during a presentation and discussion. Quantitatively, the number of students who are active and use the book as the basis of their knowledge is improved, but their sharpness analysis should be still improved to strengthen their knowledge. Comprehensive thinking towards a knowledge does require a long time.

The interpretative reflection of the third cycle from the observation result (see) is shown in Table 3, it was found that the students readiness / modalities is improved because of the increased awareness and gradual loss of excessive reliance on lecturers, readiness to learn is also better in terms of quantity of students in the classroom , enjoy and not rigid in the presentation of group discussions is compelled by the students' prior knowledge readiness sourced from the multiplication of references used as a learning resource, Thus recommend the last cycle learning (the fourth) to undertake the cycle 3 design with an emphasis on the multiplication and diversity of references used in the problem solving prepared by a lecturer and also encourage more students to contribute in the group.

Table 3
The Implementation of SRL Phase Cycle 3

SRL Phase	Indicator	Observation Result
Designing learning,	<ul style="list-style-type: none"> - Modality of study - Readiness to learn 	The student learning readiness is improved from the second cycle, this indicates that student awareness towards the importance of readiness is good. Likewise the students prior is quantitatively even in the class, though the change is not significant, but the graph shows a good increase. Student learning design is starting to appear, in line with the learning meeting in the middle of semester.
Monitoring the progress of learning	<ul style="list-style-type: none"> - Initiation - Creativity - Learning Resources 	The class engagement collectively encourage students thought initiation to the problems occur in the process of individuals learning in the class is getting increased in line with the class academic atmosphere. This encourages the learning achievement increased slightly compared to the previous cycle, with an indication of improvements in the process of discussion going on in the classroom. Exposure to the more structured arguments of some students, though still noticeably dominance in some active students. Rigidity in response is slightly reduced as a result of getting maximum readiness and student independent learning, thus strengthening the process of knowledge internalization independently by students.
Evaluating the results of the study completely	<ul style="list-style-type: none"> - Goal among - Learning outcome 	Self-actualization as a critical part of the actualization of knowledge, at least to an improvement of better understanding in most students. Students' achievement as a result of independent learning is slowly showing results although it is still very far from ideal.

The Fourth Cycle.

At the final stage of a series of learning cycles planned (do), the fourth cycle still sees and examines the recommendations of the third cycle reflection, that is to continue the learning plan to use the students grouping pattern and give sufficient time for students to interact with the group even between groups for 2 weeks, and still insists on the use of more comprehensive references. The analytical approach to the problem provided by lecturers and stressing additions to the concept of comparison is seen as the appropriate choice towards the effort of students' knowledge comprehension independently. The use of reference from the internet increasingly dominate in this fourth cycle. In this cycle, there are more changes in the students learning, especially in the process of presentation and discussion. Until the fourth cycle, we recently show the quantitative fact of learning outcomes and the acquisition of knowledge cannot be seen quantitatively yet. Nevertheless, it quantitatively shows the improvement of students who are active and use the book as the basis of their knowledge, assumed to have been an increase in independent learning that tip ends until the achievement of student learning.

The interpretative reflections on the fourth cycle in the process of observation (see) is shown in Table 4, found the fact about the improvement of students' readiness / modalities because of the increased awareness and gradual loss of excessive reliance on lecturers, readiness to learn is also better in terms of quantity of students in the classroom , enjoy and not rigid in the presentation of group discussions is compelled the students' prior knowledge readiness comes from the addition of references used as a learning resource. The last portion obtained from the fourth cycle, there has been an increased independent learning, although not reached the ideal conditions yet, much more effort must be made.

Table 4
The Implementation of SRL Phase Cycle 4

SRL Phase	Indicator	Observation Result
Designing learning,	<ul style="list-style-type: none"> - Modality of study - Readiness to learn 	The student learning readiness is getting improved in the third cycle, as well as the students modalities is quantitatively more even in the class, though the change is not significant, but the graph shows a good increase. The student learning design is starting to clearly appear, in line with the learning meetings above the middle of the semester.
Monitoring the progress of learning	<ul style="list-style-type: none"> - Initiation - Creativity - Learning Resources 	The class engagement collectively encourage student thought initiation to the problems that occur in the process of individuals learning in the class is getting increased in line with the class academic atmosphere. Extra stressing hooked up with tasks related to the ratio of a sub item in the fourth cycle, related to education in various countries, making learning resources on the internet is more prominent and dominate student references used in analyzing the issues presented for the group task. This also encourages the learning achievement a little more improved than in previous cycles, with an indication of improvements in the process of discussion going on in the classroom, and delivery dynamics in rebuttal arguments of class members. Exposure to the more structured arguments of some students, though still noticeably remained dominance in some active students.
Evaluating the results of	<ul style="list-style-type: none"> - Goal among 	Self-actualization as a critical part the

the study completely	- Learning outcome	knowledge actualization, at least to the better understanding of most students. The learning achievement as a result of independent learning is slowly showing the results although it is still very far from ideal.
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Based on the research result and data analysis, it showed that the implementation of lesson study in learning with problem solving approach using the reference analytical usage which is improved gradually through meetings, found an improvement of students activity and student learning outcomes through self-reliance learning indication. Improved activity and student learning outcome as a result of improved students' independent learning fosters a sense of great curiosity to find the answer to a problem, then encourage them to seek information in order to solve the existing problems through reading in details and analyzing the references as the primary source of learning.

Butler (2002) stated that lecturers should help students implement SRL cycles in a flexible and adaptive manner by:

- Helping constructing metacognitive knowledge on academic tasks, strategies for analyzing the tasks, skills applying the strategy, and strategy to monitor own self and strategy that uses a feedback.
- Encouraging metacognitive thinking in defining academic task objectives, strategies to analyze the tasks, skills applying the strategy, and a strategy to monitor own self and strategy for feedback.
- Encouraging positive self-perception towards the ability and self-view. Student excellence self-perception will influence the goals set, commitment to goals, and learning strategies taken.

The expression of knowledge and metacognitive thinking here states that individuals who learn it are aware of all the steps earned, and reflect or monitor and evaluate the steps, through questions to themselves. The cognitive processes, gain confidence in students whether they have done right or not. In the next phase, a self-efficacy will grow and provide more quality learning outcomes. Thus the continuous cycle will take place between process and product of SRL, self-efficacy, SDL, and meaningful learning outcomes.

4. CONCLUSION.

Based on the results of research and the data analysis, can be summarized as follows:

1. The implementation of Lesson study in learning with problem solving approach using the reference analytical usage which is increased gradually through meetings, found the improvement of students activities and student learning outcomes through independent learning.
2. The improved students' independence learning can be seen on their learning modalities through cycles, resulting in better engagement readiness in learning
3. Although the spread of maximum independent learning is not found yet, but in 4 cycles of learning has gained students' independent learning changes using the multiplication of reference quantitatively, and overall encourage the improvement of students' independent learning process. This indication is seen by the increasing loss of rigor in conducting presentations and delivering arguments by relying on a strong theory.

5. SUGGESTION

Based on the research conclusions, the researcher suggests the needs to encourage students to become expert learners, through the use of a clear strategy in learning, such as repeating sstrategy, elaboration, organizational, understanding and monitoring, and affective strategy, and the development of reflective thinking skills such as how to ask own self, as well as implement SRL extensively for a long time and followed by giving an informative and corrective feedback.

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The implementation of metacognition strategy on cooperative learning as alternative practices to make school as learning community.

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Abstract : The aim of this work is to investigate implementation metacognition strategy on collaborative learning effect on achieving Lesson Study Learning Community (LSLC) goal i.e. transforming classroom and school for 21st of century learners. Three of them are The effort to achieve simultaneously between quality and equality, curriculum changes from program model (target achievement) to Project model (thinking process and exploration) and the shift from classical learning to collaborative learning. We consider metacognition strategy because the metacognition strategy because it's suitable with this transformation. The learning design is divided in three main parts: Introduction (Sharing Learning) Main Activities (Jumping Learning with metacognition strategies) Closing (Presentation and Conclusion). We have implemented the learning design to two high schools in Bandung, West Java-Indonesia in tenth grade physics class learning static fluid, elasticity and heat topic. Based on pretest and post test analysis, this implementation has successfully made equality with increasing quality in cognitive achievement in each physics topic learning. Based on four observers in each class, they all agree that this learning design has promoted two of transform classroom and school for 21st of century learners i.e. curriculum changes from program model (target achievement) to Project model (thinking process and exploration) and the shift from classical learning to collaborative learning. Based on student questionnaire, in each topic learning most of them (around 60% student) agree that they learn a lot from their friend and internet instead of their teacher and text book. Or in other words we sense learning community arise from this learning design implementation. Along with this facts and evidence, we propose this learning design as alternative practices to make school as student learning community. This work is LSLC work between Lecture and teacher guiding three physics education Students work on their final examination.

Key words : metacognition strategy, cooperative learning, learning community

1. INTRODUCTION

One goal Lesson Study Learning Community (LSLC) reformation is reform learning activity by transform classroom and school for 21st of century learners i.e. curriculum changes from program model (target achievement) to Project model (thinking

process and exploration) and the shift from classical learning to collaborative learning. For that to make school as learning community both for among student and for among teacher. We need to try to design learning design that fulfill that transformation and investigate its effect to fulfill LSLC reformation. Its result will enrich educator especially for physics educator as one alternatives to make school as learning community both for student and their teacher.

Learning is interaction process between students, teacher and learning sources in learning environment. (UU No 20 tahun 2003 national education system). Ability to solve problem is one of important indicator in thinking competency and very useful in student next life. One factor that effect student success in solving problems is metacognition skill (Hacker, 1998). Therefore in one ability that should achieve in Indonesia national curriculum 2013 is metacognition skill (Permendikbud no 104, 2014). Metacognition is defined as an individual's ability to reflect, understand, and control their own thoughts and acts. Therefore, metacognition strategy is a guide to solve problems by considering several alternative solutions.

Strategies for developing metacognitive behaviors according to Blakey dan Spence (1990) are

1. Identifying "what you know" and "what you don't know."
2. Talking about thinking.
3. Keeping a thinking journal.
4. Planning and self-regulation.
5. Debriefing the thinking process.
6. Self-Evaluation.

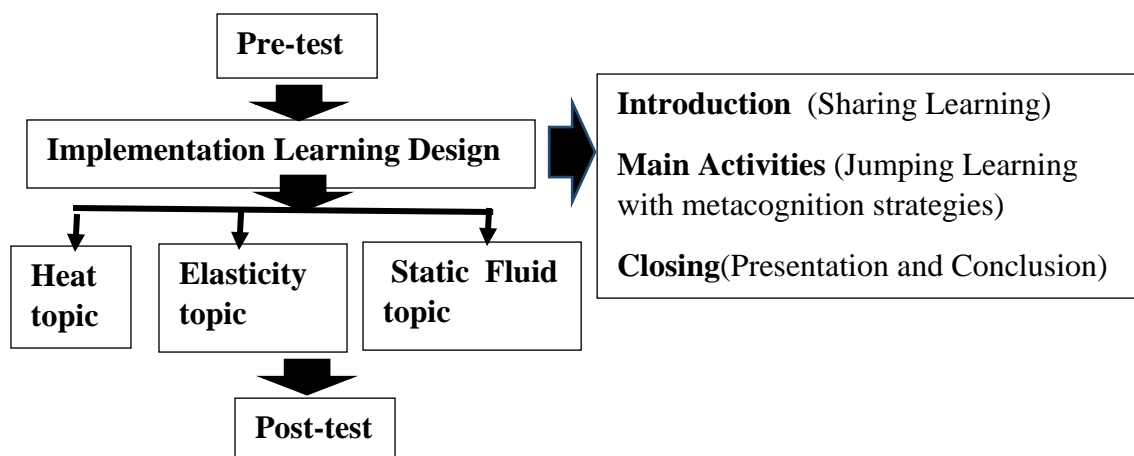
In this work, we have designed a learning design meant to fulfill LSLC reformation. Based on previous study we combined metacognition strategy on collaborative learning because we believe this combination is fulfill LSLC reformation. Therefore in this study we try to investigate implementation metacognition strategy on collaborative learning effect on achieving Lesson Study Learning Community (LSLC) goal i.e. transforming classroom and school for 21st of century learners. To see its consistency we implement this learning design three different physics topic learning. We ask our LSLC member to participate on observing the learning process. This work is LSLC work between Lecture and teacher guiding three physics education Students work on their final examination.

2. RESEARCH METHODOLOGY

This research is ex post facto research. When translated literally, ex post facto means 'from what is done afterwards'. In the context of social and educational research the phrase means 'after the fact' or 'retrospectively' and refers to those studies which investigate possible cause-and-effect relationships by observing an existing condition or state of affairs and searching back in time for plausible causal factors¹⁾

The samples in this study are 40 tenth grade students in Heat class, 31 tenth grade students in elasticity class and 35 tenth grade students in static fluid class.

Research methodology of this work is shown in picture 1



Picture1: Research methodology

As mentioned previously The aim of this work is to investigate implementation metacognition strategy on collaborative learning effect on achieving Lesson Study Learning Community (LSLC) goal i.e. transforming classroom and school for 21st of century learners. One of them is getting simultaneous achievement between quality and equality. As shown in picture 1. We try to analyze their cognitive achievement by giving them pre test before the learning design implementation and post test after we implement the learning design. We compare their pre test and post test average and deviation standard to analyze their improvement and range achievement. To analyze the consistency the effect of this learning design implementation we implement this learning design to three different physics topic taught in tenth grade physics class learning static fluid, elasticity and heat topic. We also analyze development Student's thinking process by analyzing Students Thinking Journal (STJ) in each class. The instrument used in this work are cognitive test of three topic, heat, elasticity and static fluid, Students Thinking Journal (STJ)

Learning Design: Metacognition strategy on Collaborative Learning

This learning design is meant to full fill LSLC reformation to transform classroom and school for 21st of century learners. Three of them are the effort to achieve simultaneously between quality and equality, curriculum changes from program model (target achievement) to Project model (thinking process and exploration) and the shift from classical learning to collaborative learning. We consider metacognition strategy because the metacognition strategy as we mention earlier suitable with this transformation. The learning design is divided in three main parts:

(1) Introduction Part (**Sharing Learning**): teacher give a chance to student to share their task before they enter the class i.e. read the material that will be learned today and ask what they know and what they don't know from their reading and let their friends to add and ask question. The teacher give them **Share Test** to solve individually which is a conceptual problem to measure their comprehension that should be achieved by all students. Then the teacher give feedback and enlightenment the concept and fix the incorrect concept

(2) Main Activity (**Jumping learning with metacognition strategies**): The teacher give **Jumping Task** which is a problem contain concept application on different situation. The students can't find the solution directly from their text book. To solve the

problems, they have to solve in following steps and write it down on Students Thinking Journal (STJ): First they have to solve the problem Individually, Second they are allowed to seek from Internet, they can change their previous answer. Third they are allowed to share the solution with their friends in groups, in this session we hope that there will learning through dialogic communication. They can change their previous answer. The teacher also provide experiment apparatus for them who decide to solve the problem using experiment methods.

(3) Closing (**presentation and Conclusion**). Each group performed their solution and let others to argue, add and ask question. Then The teacher give them feed back and together with students conclude and give enlightment to those who has incorect solution.

3. FINDING AND DISCUSSION

3.1. Learning design impementation effect on simultantly achievement between quality and equality

Pre-test and post-test average and deviation for each topic class is shown in table 1.

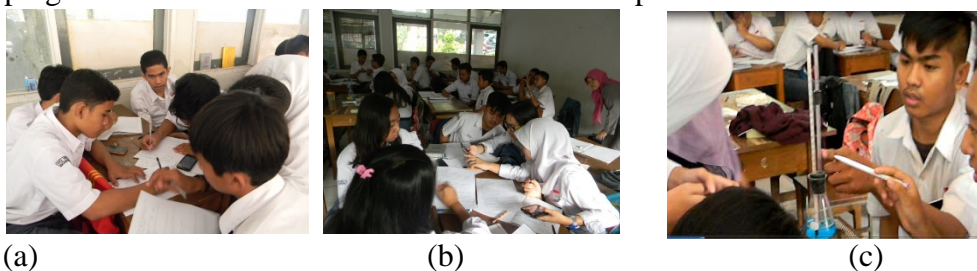
Cognitive achievement	Average		Standard Deviation	
	Pre-test	Post-test	Pre-test	Post-test
Heat	33,2	61,1	15,3	9,1
Elasticity	17,7	66,9	7,3	6,9
Static fluid	49,4	85,5	10,5	9,5

Table 1. Pre-test and Post-test Average and deviation standard each topic

From table 1 , we can see that the average post-test is higher than average pre-test for each topic. It means this learning design have succesfully increased the student achievement. Or in other word this learning design increase the **quality** in student cognitive achievement. From table 1, we can see that the standard deviation for post test for each topic learning is smaller then pre-test standard deviation. It means that this learning design implementation have succesfully make significant **equality** in cognitive achievment for each topic learning. Based on this fact this implementation have succesfully make equality with increasing quality in cognitive achievment.

3.2. Development Student's thinking process

We analyze student's thinking process from Students Thinking Journal (STJ) in solving jumping task and observe their interaction as seen in picture 2



Picture 2, students activities solving jumping task (a) discusion in group (b) students browse internet and (c) students solve by experiment

The recapitulation of development student's thinking process when solving jumping task each metacognition strategies can be seen in table 2, 3 and four.

Jumping Task Problems for student to solve	Individual thinking	Browsing internet and group discussion	Solve by fact from experiment done in groups
(Heat topic) is water possible to be filled as termometer liquid?	53,85% student answer incorectly 46,15 % Student answer correctly with 41,02% with incorect reason and 5,13% with corect reason	82,05% students change their answe and reason 17,95% students stick with their previous ansvera	97,44 % students answer corectly 2,56% students answer incorectly

Table 2. Development student's thinking process solving Heat jumping task

Jumping Task Problems for student to solve	Individual thinking	Browsing internet to find the answer	Group discussion
(Elasticity) if you are a climber, what 's your consideration to choose climber rope?	- Diferentiate type of rope based on its diameter (8 students / 25,81%) - Diferentiate tipe of rope based on relation between its diameter and weight (4 siswa / 12,90%) - Answer incorectly (19 siswa / 61,29%)	- Diferentiate type of rope based on its diameter and its Stress (6 students / 19,35%) - Answer based on relation between rope stress, strain and elastic modulee. (8 students / 25,81%) - Answer incorectly (17 students / 54,84%)	- Diferentiate type of rope based on its elacticity properties (15 students /48,39%) - Conect weight and its diameter using stress concept. (9 students / 29,03%) - Answer incorectly (7 students / 22,58%)

Table3 development student's thinking process solving Elasticity jumping task

Jumping Task Problems for student to solve	Individual thinking	Browsing internet to find the answer	Group discussion
(Static Fluid) if you want to explore marine life near surface and the bottom of ocean, do you use thesame type of submarine? Why	Consider the depth (6 of 40 students) Consider the thickness of submarine (10 of 40 students) Answer incorectly 24 of 40 students)	-relate their answer with hidrostatic concept (15 of 40 students) Don't Relate their answer with hidrostatic concept(20 of 40 students) Answer incorectly (15 of 40 students)	Relate their answer with hidrostatic concept (25 of 40 students) Answer incorectly/ the answer not related to hidrostatic concept (15 of 40 student

. Table4 development student's thinking process solving Elasticity jumping task

Based on four observers in each class, they all agree that this learning design has promoted two of transform classroom and school for 21 st of century learners i.e. curricullum changes from program model (target acvievment) to Project model (thinking process and exploration) and the shift from clasical learning to colaborative learning Based on table 2, 3 and 4 generally show that each step metacognition instruction make development student thinking increases to solve the jumping task. And the most develop

is when they share their ideas in group discussion. In solving jumping task in each topic we can see that the metacognition strategy can provide students alternative solution to consider the proper solution. And with collaborative learning make students consider the proper solution by listening and learning each other. In other word they are learning through dialogic communication. From students questionnaire, Most of them agree that this kind of learning make them happy to study physics topic instead of listening to teacher and solving physics problems with mathematics. They agree that solving physics problems is not necessary solved from text book or teacher. With this kind of learning, They realize that they can learn from other source like internet and their friend. In fact based on student questionnaire in each topic learning most of them (around 60% student) agree that they learn a lot from their friend and internet instead of their teacher and text book. In our observation in each topic learning, democratic community is created. Or in other word we sense learning community arise from this learning design implementation. Therefore we propose this learning design as alternative practices to make school as learning community

4. CONCLUSION

Based on data analysis and findings this implementation have successfully have successfully make **equality with increasing quality in cognitive achievement** in each physics topic learning, which is one of learning characteristics for 21st of century learners. Based on four observers in each class, they all agree that this learning design has promoted **two of transform classroom and school for 21st of century learners** i.e. curriculum changes from program model (target achievement) to Project model (thinking process and exploration) and the shift from classical learning to collaborative learning. In solving jumping task in each topic we can see that the metacognition strategy can provide students alternative solution to consider the proper solution. And with collaborative learning make students consider the proper solution by listening to each other. In other word they are learning through dialogic communication. In our observation in each topic learning, democratic community is created. Based on students questionnaire, in each topic learning most of them (around 60% student) agree that they learn a lot from their friend and internet instead of their teacher and text book. Or in other word **we sense learning community arise from this learning design implementation**. Along with this facts and evidence, we propose this learning design as alternative practices to make school as learning community

5. ACKNOWLEDGEMENT

We would like to thank Bandung Physics and science LSLC for supporting this research, providing place, time, ideas.

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Increase Critical Thinking Skills And Psychomotoric Through Lesson Study Activity on Student of MA Mu'allimat NW Pancor

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Abstract: The purpose of this study is to examine efforts to increase critical thinking skills and psychomotor on student of MA Mu'allimat NW Pancor. Students learning science through physics with scientific approach in a series of activity of Lesson Study. Learning methods that was applied in Subjects Physics was experimental methods. This research was conducted in four cycles Lesson Study, they are plan , do and see. The instruments used were observation sheet consisting of observation sheets psychomotor skills and critical thinking . The method in this research was descriptive with research subjects class X - 1 the second semester of the academic year 2014/2015 . Data were analyzed by calculating the results of observations mean score on each domain competencies acquired , and then calculated as a percentage. At the critical thinking skills , there are five indicators considered are formulate the problem , give arguments , perform deduction, induction , evaluation and decide and implement. Five indicators increased from OC 1 to OC 4 , namely 82.7 % , 85.5 % , 82.5 % , 85.2 % and 87.9 % . On Psychomotor skills there are three indicators were assessed namely selecting and crafting tools , work procedures and filling the observed data. All three indicators increased from OC 1 to OC 4 , 4.56 % , 4.67% and 5.3 % . Based on data analysis was done by descriptive conclude there was an increase in critical thinking skills and psychomotor in class X - 1 MA Mu'allimat NW Pancor through Lesson Study activity with scientific approach.

Keywords : Learning science physic , scientific approach , Lesson Study , psychomotor skills and critical thinking

1. INTRODUCTION

The education process is the most important process in human life . The process is the key word of all forms of behavior , the introduction of the world and the environment and how humans respond to environmental action . Education simultaneous , orderly , well-planned and sustainable will affect the performance of his life. True education is an effort to help people in stages of development moving towards personal excellence .

Physics is a science that studies the symptoms and natural phenomena. Physics is part of the natural science that describes and analyzes the structure of natural phenomena , engineering and the environment based on a causal link that appears existing laws in physics. Learning is an effort to learn the students. Learning comes from the word "teaching " which means an effort to provide the knowledge that someone can do something . Learning in High School has a very important characteristic that broaden , deepen and sharpen the child's conception of knowledge they have acquired at primary and secondary schools first level (Wena , 2009: 5) .

According to Yamin (2003 : 105) " Learning is an activity that brings people to the development of the whole person , including the development of cognitive , affective and psychomotor " . Learning is a mental or psychic activity , which takes place in an active interaction with the environment , which resulted in changes in knowledge - understanding, skills and attitudes (Winkel , 1999: 53) Students who critically and creatively indispensable in the learning process will increase student achievement in learning. According to Sudrajat (2008) , Lesson Study is one of the efforts to improve the learning process and results are implemented in a collaborative and sustained by a group of teachers.

Lesson Study is an activity undertaken by teachers to work together to plan activities to improve the quality of learning that teachers and students learning activities , and will make a professional teacher with a good design implementation (Mustikasari , 2008).

Through three stages in Lesson Study , namely planning (plan) , implementation (do) and reflection (see) , a teacher who collaborated in the preparation of lesson plans can exchange ideas to find solutions to the problems faced (Samsuri and Ibrahim , 2008).

Science education emphasizes providing direct experience to develop the competencies that the students were able to explore and understand the universe around scientifically . Science education is directed to find out and do something that can help students to gain a deeper understanding of the nature around . Therefore , the approach applied in presenting science learning is combining the experience and understanding of science process science products in the form of direct experience (Depdiknas, 2009) . Learning physics lecture method that is held in MA Mu'allimat NW Pancor , resulting in the ability of motor skills and affective attitude of students is less developed.

Low affect students seen from the behavior of students during the learning process . Most students are able to compile tools, measuring volume , using a thermometer and stopwatch properly , while the other students still do not understand . In addition , there are many students who do not understand the form , usability , and how to use the tools available in science , especially physics laboratory . Low affective aspects of students seemed less enthusiastic students during the learning process , in a group discussion class discussion.

At the time trial events , the cooperation of students still less .When the discussions only some students are actively discussing , while others just listen to explanations from the teacher refusing to issue an opinion or disclaimer unless told to. There was even a student who joked and looks dreamily during the learning process takes place . In addition, students are also less bold in questions or answers. Students will learn better if the environment is created naturally. Learning would be more meaningful if students experience what is learned and not know it. One alternative to strive to increase the psychomotor and affective aspects of students is through scientific study .

The learning process of implementing a scientific approach will touch three areas , namely : attitude (affective) , knowledge (cognitive) , and skills (psychomotor) . With the learning process so it is expected that the learning outcomes of students who gave birth to a productive , creative , innovative , and affective through the strengthening of attitudes , skills and knowledge are integrated (Implementation of Curriculum 2013 : 2013).



Sumber :Diklat Guru, Implementasi Kurikulum 2013

Researchers have carried out a preliminary study of the various models of learning by reading literature that contains it . Some contemporary learning models have been discovered by education experts . Among the models that researchers will take Scientific learning model with an experimental method to improve critical thinking skills and psychomotor student .Critical thinking skills that exist in all people , especially those who are normal to genius. Academically it is believed that critical thinking is generally owned by people who are highly educated.

People like this are usually thinking correctly believed by many. Of course, the thinking is not entirely true , because it is not based on the results experiment valid and reliable , because it was only based on the opinion that mere logical mind (Kowiyah : 2012). This study was carried out aimed at implementing the scientific learning through Lesson Study to improve critical thinking skills and psychomotor student.

2. RESEARCH METHODOLOGY

This type of research is descriptive is to examine the critical thinking skills and psychomotor student in physics with scientific learning model through Lesson Study he subjects of this study were students of class X - 1 MA Mu'allimat NW Pancor in the second semester of the school year 2014/2015 Lesson Study was conducted by 4 cycles each consisting of stages of Plan, Do and See. Instrument used is observation sheet consisting of observation sheets psychomotor skills and critical thinking.

Data analysis techniques used in this research is descriptive analysis to analyze the increase in critical thinking skills and psychomotor student . Data were analyzed by calculating the results of observations mean score obtained , are then calculated as a percentage determine the activity of students during the learning process and review the activities of reflection sheet Lesson Study to determine the increase of learning tools are developed . The effectiveness of learning physics in scientific models Study with Lesson activities towards scientific work skills / student experiment and think critically analyzed by comparing the results of the observation skills of scientific work and critical thinking of students with average motor skills and critical thinking .

3. FINDING AND DISCUSSAND

Descriptive research in physics learning approach Scientific through Lesson Study produces learning device consisting of RPP Physics which invites students to think creatively and critically at the problems created by discussing the material on " Heat " , of the material prepared RPP to 4 times meeting each meeting held for 2 X 45 minutes . Each RPP raised the topic , RPP first raised the topic " Temperature and Expansion " , RPP second theme " Heat and phase transition " , the third RPP raised the topic " Heat Transfer " and the fourth RPP raises the topic " Azaz Black ". Instructions practicum developed in this study consists of three practical activities and problem-based one . Instructional Materials Physics created by discussion of the material . Lesson Study on stage plan RPP see produced some generated by the model teacher and team Lesson Study. At the time of reflection there are some things presented by Lesson Study team member that can be seen in Table 1. The results of the observation of student activity related to scientific work skills at each stage of the trial showed an increase of scientific work skills as well as critical and creative attitude of students , Table 2 shows the percentage of the working skills of observation and critical thinking skills of students of each meeting has increased. Based on observations on the students in the following study Physics with Scientific learning model showed an increase in first meeting until forth meeting . Improved skills of scientific work / experiment is accompanied by critical thinking skills of students when the learning process carried out in the classroom.

Table 1. Results Of Reflection Of Lesson Study

NO	OC 1 (27-04-15)	OC 2 (04-05-15)	OC 3 (18-05-15)	OC 4 (24-05-15)
1	Exceeding the time that has been provided	Most of students do not read thoroughly working procedures	Worksheets in the grasp of each student	Practical still proof but still there has been no new discovery (Dr. Ibrahim)
2	Inadequate equipment	Some students are still not maximal in the use of practical tools	There is one group still concluded based on textbooks, not confident with his own answer	
3	40% of students are active in the rest lack of concentration in performing lab activities	Each group can already divided themselves in working together to complete the task		
4	Demonstrate the use of tools and materials lab and remind students to be careful at the time of the experiment	At the end of the lesson after the lab was completed, some children lost concentration learning		

Graph mean psychomotor skills of students

Mean achievement

Table 2. Average of students psychomotor skills

OC	select and sort tools	work procedures	Write data
1	3,8%	3,9%	4,8%
2	4,2%	4,4%	5,4%
4	5,7%	5,7%	5,7%



Table 2. the mean critical thinking

OC	A	B	C	D	E	F
1	63%	57%	76%	77%	76%	76%
2	80%	63%	84%	81%	81%	84%
3	92%	69%	89%	82%	88%	92%
4	96%	86%	94%	90%	96%	100%

Keterangan

A : Formulate problems

B : Argues

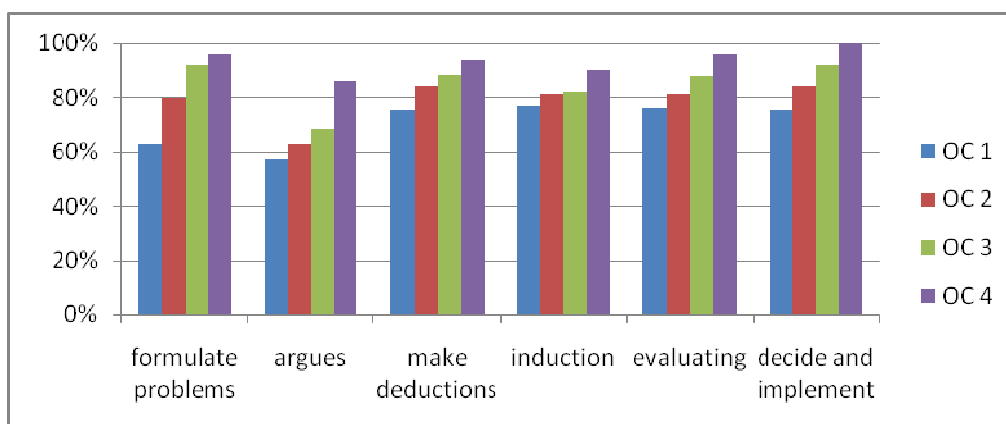
C : Make deductions

D : Induction

E : Evaluating

Graph of the average students' critical thinking

Mean achievement



Improved critical thinking skills and psychomotor students is evidence that the application of learning in the learning Scientific Physics at MA Mu'allimat NW Pancor developed through Lesson Study can be implemented effectively . Because the teacher is really ready with RPP and media will be used so

that during the learning process takes place in accordance with what we want. According Santysa (2009 : 5) lesson study is one of the strategies of teacher professional development . Use of Scientific learning in physics learning can create conditions centered learning and critical thinking skills that students can construct knowledge and can integrate lessons learned at school with daily life (Journal of Basic Education : 2012) .

Giving an issue and seek answers in the learning process can help students to be able to more easily remember the material being studied , so that students can better understand the material . In this study conducted in a laboratory of learning physics by lifting the problems that can be solved through research in the laboratory .

Research conducted by the students are guided by teachers , providing a direct experience for students to find their own the cause of the problem through a process of scientific work that includes skills in making observations , formulating the problem , formulating hypotheses , designing and conducting experiments , summed up the results of the experiment , prepare reports and communicating (Implementation of curriculum 2013 : 2013) .

From a philosophical perspective , Watson and Glaser stated that critical thinking as a combination of attitudes, knowledge and skills . The learning activities in the lab gives students the opportunity to use the equipment and materials to be able to construct a knowledge of the facts found and connect with science concepts that exist in the subject at school . Through these activities students can independently and in groups find the answer to a question given by the teacher and students can construct knowledge he had acquired , so that the knowledge gained will be stronger in students' memories .

Scientific Learning is very supportive in improving scientific skills , critical and creative students in implementing learning especially with the experimental method . Penner develop critical thinking is the same as motor skills . One of the best approaches to developing thinking skills is to give the questions while guiding students to associate with the concept already has. Improved critical thinking skills fully supports the improvement of scientific work , the application of learning the scientific approach in teaching physics also showed an increase of scientific work skills of students . Lesson Study conducted through three phases: plan, do and see (Samsuri and Ibrahim : 2008) . Lesson Study conducted by teachers of Physics at MA and a team of experts strongly support teachers to improve their ability to write lesson plans , worksheets , evaluation tools , teaching materials to the ability to convey the material in class . Observations Lesson Study team when the testing process in the class who then delivered in stages see , helping teachers to improve learning tools that have been developed . The better the learning device that supports the ability of teachers to create effective learning so that students can learn in an atmosphere of scientific learning and are able to understand the material well , so scientific ability and learning achievement can be improved . Lesson Study activities aimed at improving the professionalism of teachers through improved teaching methods and increasing knowledge

Lesson Study activities provide a large enough impact to teachers , it is evidenced by the increasing ability of the teachers who have participated in the Lesson Study in preparing the RPP by applying learning models that are relevant , and capable of implementing learning guided by the RPP have been made , and after following the Lesson Study teacher able to guide other teachers in planning and implementing Lesson Study .

4. CONCLUSION

Based on the results of research and discussion can be concluded that : 1) there is an increase in critical thinking skills and psychomotor student by applying learning scientific through Lesson Study activities where students are more skilled in expressing an idea and skilled in carrying out practical activities, 2) the implementation of Lesson Study is expected to improve the quality of learning in physics for teachers involved can learn from their lessons from planning learning , observing and reflecting .

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**Improve Students' Reasoning Ability in proving theorem through project based learning (PjBL):
Lesson Study in Real Analysis course**

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Abstract: This research aims to know improving the students' reasoning ability in proving theorem in the real analysis course. Analysis real course contains about the analysis that require high order thinking skills, so that only a few students who finished this course well. Reasoning ability is one of the competences that must be owned by students. One of the strategy to improve the reasoning ability by using a project-based learning (PjBL), giving the project to students that is given one week before learning in class. Subjects in this study were students of the fifth semester on Mathematics Education, consisting of 35 students. The data collection methods used interviews, tests, observation and documentation. The data analysis technique includes data reduction, data presentation and conclusion. Based on the results, can be concluded that the project-based learning can improve reasoning abilities of students. In addition, from the analysis of quantitative data obtained that the reasoning abilities of students increased about 10.5%.

Keywords: *reasoning ability, proving the theorem, project based learning (PjBL).*

1. INTRODUCTION

One of the five higher order thinking skills is the ability of reasoning. The biggest challenge for prospective teachers is to improve the reasoning ability for students. It is important to develop reasoning in mathematics lessons (Swan, 2011). Advances in technology now greatly affect the world of mathematics education. Students tend to choose a fast way of solving mathematical problems. This not only affects the way it mathematics but more than that, an attitude that should be fostered also changed, the attitude of never give up.

Students at Mathematics Education, university of muhammadiyah gresik, whose profile into mathematics educators should be equipped to be able to teach reasoning to their students later, so that these students themselves should have a pretty good reasoning ability. Students study mathematics education program that is the subject of this research still own a low reasoning ability, it is evident the students often experience difficulties when resolving problems less complex. The student reasoning skills must be improved. Analysis real subjects contains more about proving theorems requiring very good reasoning ability.

1.1 Reasoning

Reasoning is the process of drawing conclusions from the evidence, the basis and assumptions owned. Reasoning is the ability to think, understand, and form opinions or judgments that are based on facts (Longman, 1987). According Nurhayati (2012) to understand the material or the concept of mathematical reasoning ability is needed. According Jujun Suriasumantri S. (1999) stated that the reasoning is a thought process in drawing a conclusion in the form of knowledge and have certain characteristics in finding the truth. Tim van Gelder (2000) stated that informal reasoning important because Informal reasoning is required for rational belief, informal reasoning is a basic cognitive skill required for effective functioning in most intellectual disciplines. The results of case studies conducted by Gunhan (2014) found that of the six grade 8 students shows that different processes of reasoning in solving geometry problems.

According Susilawati (2009) indicators for mathematical reasoning: 1) Draw conclusions logically, 2) Provide an explanation using the model, the facts, the nature and relationships, 3) Estimate the answer and the solution process, 4) use patterns and relationships to analyze the situation of mathematics, drawing analogy and generalization, 5) Compile and analyze conjecture, 6) Provide opponent example (Counter example) or non example, 7) Following the rules of inference (Drawing conclusions), examine the validity, 8) Develop argument are valid, 9) Develop direct proof, indirect proof and mathematical induction.

Meanwhile, according to Ministry of Education (2004), there are seven indicators of the ability of reasoning, namely 1) Capability serving statements math orally, in writing, drawings and diagrams, 2) Ability filed allegations, 3) Ability to perform mathematical manipulations, 4) The ability to compile evidence, give reasons / evidence of the truth of the solution, 5) the ability to draw conclusions from the statement, 6) Checking the validity of an argument, 7) Finding the pattern or nature of symptoms mathematical generalization.

In this study, there are six indicators of the ability of reasoning used, namely 1) able to identify what is known and what is to be proved, 2) estimating the settlement process, 3) develop a conjecture and strategy of proof, 4) provide a logical argument by using the steps systematically, 5) drawing analogies and generalizations to decide their logical conclusion.

1.2 Proving Theorem.

Subjects Real Analysis more contains definition and theorems. Therefore the project is given to the students is how students can understand and then prove the truth of his theorem. Proof is a problem-solving activity, not a procedure that can be done routinely (Cirillo 2009).

1.3 Project based learning

Project based learning is learning that involves students fully in solving the problems that have been designed by teachers that culminate in authentic products produced by students. Well-designed project will encourage active learners and to increase high-level thinking skills of students, one of which is the ability of reasoning. Learning priorities transfer mathematical knowledge, skill, and reasoning to solve real-world problems (Wiggins, G. & McTighe, J, 2004). Project-based learning is a powerful tool in a teacher's repertoire of strategies (NAF,2015). Project-Based Learning (PjBL) serves as an instructional approach to classroom teaching and learning that is designed to engage students in the investigation of real-world problems to create meaningful and relevant educational experiences (cervantes, 2013). Project-Based Learning is a good vehicle for helping students make progress on a number of mathematics educational goals not directly covered in the "traditional" math curriculum (Mahmudi , 2011).

Project-Based Learning is a systematic teaching method that engages students in learning essential knowledge and life-enhancing skills through an extended, studentinfluenced inquiry process structured around complex, authentic questions and carefully designed products and tasks. (Mergendoller & Lenz, 2006).

Project-based learning has many benefits for students, including a growing body of academic research supports the use of project-based learning in school to engage students, cut absenteeism, boost cooperative learning skills, and improve academic performance (George, 2001). Increased attendance, growth in self-reliance, and improved attitudes toward learning (Thomas, 2001). Academic gains equal to or better than those generated by other models, with students involved in projects taking greater responsibility for their own learning than during more traditional classroom activities (Boaler, 1997; SRI, 2000). Opportunities to develop complex skills, such as higher-order thinking, problem-solving, collaborating, and communicating (SRI, 2000). Access to a broader range of learning opportunities in the classroom, providing a strategy for engaging culturally diverse learners (Railsback, 2002). In addition Enika wulandari research (2011) shows that the implementation of learning by problem posing approach can improve students' mathematical reasoning.

Based on the background that has been described above, the researcher wants to do research with title "Improve Students' Reasoning Ability in proving theorem through project based learning (PjBL): Lesson Study in Real Analysis course".

2. RESEARCH METHODOLOGY

This research is quantitative descriptive. Subjects of this study consisted of 35 students who took the course of real analysis. Researchers describe the reasoning ability of subject in proving theorem in the real analysis course. Activities carried out based lesson study conducted in 3 cycles. Data obtained from the results of individual tests, observation sheets, documentation, and interviews with the subject. Researchers conducted interviews to the subject of this research are three groups of subjects who

representing a student's ability level, one group representing the high ability, one group representing the student group capable of being, and one group other represent groups of low ability. According to Fraenkel and Wallen (2003) that the main purpose of the interview is to find what's on their minds, whether they think or feel something. So with this interview will be obtained a description reasoning ability of the subject.

The data analysis technique used is to test and observation sheet were analyzed quantitatively, for documentation and interview researchers perform data reduction, analysis then presenting the data, and then drawing conclusion.

3. FINDING AND DISCUSSION

In preparing learning on real analysis course, in the previous students have been given the module. Learning is done based on Lesson study which the phases of Plan, do and see performed for three cycles. At this stage of plan, an analysis of student characteristics and analysis of the content of the material. Learning focused on improving student reasoning ability. At this stage do, do to student learning and observation. At this stage do see a reflection of the learning that has been done. At each cycle using project based learning, and each project is given one week before the lecture, so that by the time the lecture students are ready to present the results of their project.

Researchers design learning by dividing the class into small groups consisting of 5 people, so researchers can observe more detail to every student. The worksheets are designed the same for each group, to see the reasoning of students overall. Problems on the worksheet is designed to provide a lightweight problem then leads to more complex problems.

Burger and Shaughnessy (1986) and Clements (2003) that students need more experience with lower levels of thinking before they can succeed at higher levels. Researchers design learning into three stages, namely the discussion in the group, then the presentation of the results of the discussion, ending with the test individually.

3.1 The first cycle

In the first cycle of the topics studied are aljabara properties of real numbers consists of nine properties. The level of difficulty of the material is still low. Acquisition of reasoning ability scores for each indicator

Table 3.1 reasoning ability scores for each indicator in cycle 1

Group	Indicators reasoning abilities				
	1	2	3	4	5
Group 1	3	3	3	3	3
Group 2	3	3	3	4	3
Group 3	3	4	4	3	3
Group 4	3	3	3	3	3
Group 5	2	3	3	3	3
Group 6	3	4	4	4	4
Group 7	3	3	3	4	4
Average	2,8	3,3	3,3	3,4	3,3

From the table 3.1 we know that reasoning ability for each indicator are enough. There is one group for first indicator is still low. Group 5 can't reveal what is known and what is to be proved. It is possible students nervous, because in the next step, he can perform mathematics manipulations well.

Analysis of observations and interviews:

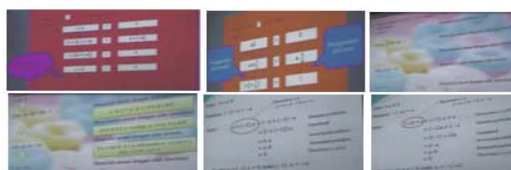


Figure 3.1 The results of students in each group discussion

Based on Figure 3.1 shows the students doing well proving process, each group can perform mathematical manipulations correctly. Students can mention logical reason of each step verification. Students can identify the mathematical knowledge required for a given proof.

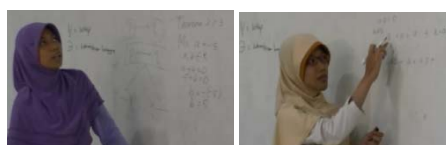
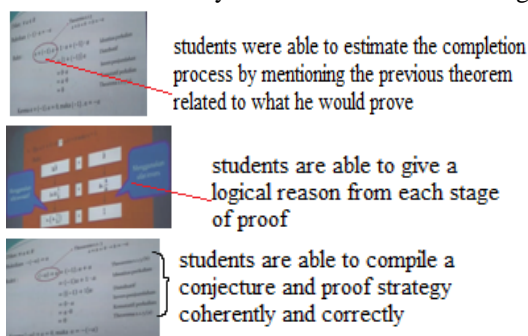


Figure 3.2 Students strengthen the verification process by providing illustrations

Based on Figure 3.2 it can be seen that the students were very understanding with the theorem that he prove it. Students are able to provide illustrative examples to reinforce the evidence.

3.2 The second cycle

In the second cycle of the topics studied are real numbers that consisting seven topics. The level of difficulty of the material being

Table 3.2 reasoning ability scores for each indicator in cycle II

Group	Indicator reasoning abilities				
	1	2	3	4	5
Group 1	4	4	3	2	3
Group 2	4	4	3	4	3
Group 3	4	4	2	3	3
Group 4	4	4	3	3	3
Group 5	2	4	3	3	3
Group 6	4	4	3	3	4
Group 7	4	4	3	3	4
Average	3,7	4	4	3	3,1

From the table 3.2 we know that the average of reasoning ability scores for each indicator are good. Although the group 5 have not experienced a significant increase. In the first indicator, almost the entire group obtained the highest score. This means, that students understand what he proved, even he can illustrate by example and figure.

For the second indicator, all of groups obtained the highest score. This means all students can identify the mathematical knowledge required for a given proof. They have

Analysis of observations and interviews:

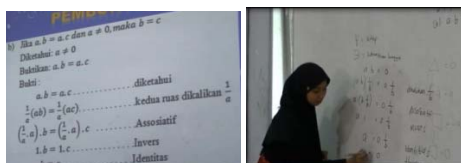


Figure 3.3: Students of group 5 presented the results of their project

Based on Figure 3.3 can be seen that the student can do with good evidence, may make a conjecture with a coherent, able to mention the logical reason of each step verification. But when researchers put the question to the student, he could not answer the questions researchers.

Here's a transcript of the dialogue of researchers and students:

Researcher : what can you conclude from the evidence that you write?

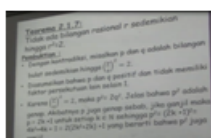
Students : a...a...(silence, no answer)

From the dialogue, it can be seen that the students still have difficulty making inferences or draw a logical generalization, although he was able to perform the verification well.



Figure 3.4: Student group 2 presented the results of their project

Based on Figure 3.3 it can be seen that the students can perform mathematical manipulations very well. When the researchers put the question to the student, he can answer it properly.



students are able to perform mathematical manipulations well, using a contradiction to prove theorems

3.3 Third Cycle

In the third cycle of the topics studied are the supremum and infimum that consisting ten topics. The difficulty level of high material

Table 3.3 reasoning ability scores for each indicator in cycle III

Group	Indicator reasoning abilities				
	1	2	3	4	5
Group 1	4	4	4	3	4
Group 2	3	4	3	4	4
Group 3	4	4	3	3	3
Group 4	3	4	4	3	4
Group 5	3	4	4	3	3
Group 6	4	4	3	4	4
Group 7	3	4	4	4	3
Average	3,4	4	3,6	3,4	3,6

From the table 3.3. we know that there are indicator decreased than cycle before. The topic in this cycle is quite high.

Analysis of observations and interviews:



Figure 3.4 Student group 1 presented the results of their project

After the student presentation, researchers asked some questions to the students. Here's a transcript of the dialogue of researchers and students:

Researcher : what different between "s" "is above with "s" is under?

Student : they are same (while pointing the picture)

Researcher : are you sure, are they same?

Student : ehm...(silence for several time), then answer "oh sorry, they are different"



Researcher : if we change position of "u", for example here (while pointing the picture), what do you think?

Students : because u is an element of S, then u can not be placed there, if u placed there, then u not supremum of S.

Based on this dialogue can be seen that the students have a good understanding of the supremum of a set. Then the researchers gave the question again:

Researcher : if known

$S = \{x | 1 < x < 5, x \in R\}$, Can you determine the infimum and supremum of S?

Students : infimum is 1, and supremum is 5

Researcher : if we change the matter with $S = \{x | 1 \leq x \leq 5, x \in R\}$, what the answer are the same?

Students : infimum is 1, and supremum is 5, the answer are same



Figure 3.5 Another student is able to explain the problem-solving, and even strengthened by the theory of the upper limit and lower limit

Based on the figure 3.5 student is able to explain very detailed and coherent, even when researchers try to develop questions, students were able to answer properly.

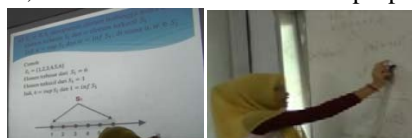


Figure 3.6 student is able to explain the upper bound and lower bound

Then the researchers gave the question:

Researcher : if the set we change

$S = \{x | 1 < x < 6, x \in Z\}$, if the answer is fixed to the value infimum and supremum?

Student : yes, infimum is 1 dan supremum is 6

Based on the dialogue, the researchers suggest that total student has not been a deep understanding of supremum, so when the context changed students are confused. Although the third cycle there are some students who do not understand the question, but it can be said overall reasoning abilities of students increased, seeing the level of difficulty about the third cycle is quite high.

Here is a graph showing the increase of score indicator of the reasoning ability, from the first cycle to the third cycle:

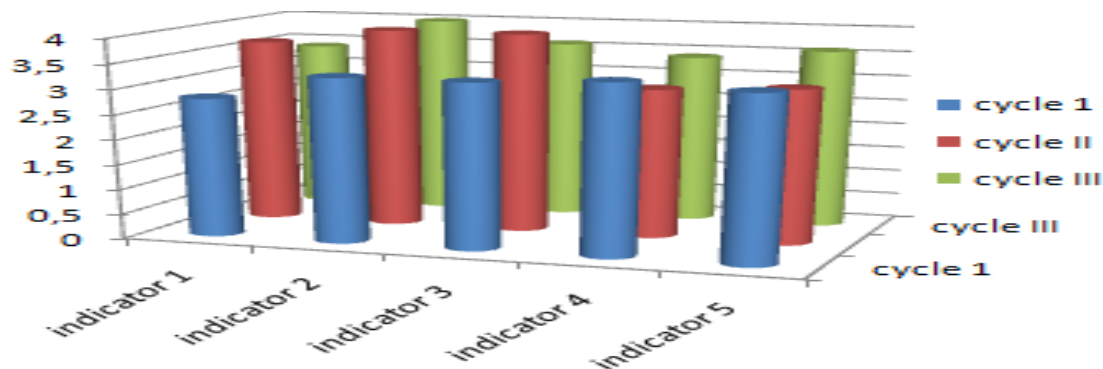


Figure 3.6 reasoning ability for three cycles

4. CONCLUSION

Based on the findings discussed above, it can be concluded that the project-based learning can improve reasoning abilities of students. While based on reasoning skills acquisition indicator scores obtained by the increase in the average score from the first cycle to the third cycle was 10.5%. Reasoning consists of all the connections between experiences and knowledge that a person uses to explain what they see, think and conclude

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THE INCREASING OF ACTIVITY LEARNING AND LEARNING OUTCOMES IN SCIENCE SUBJECTS BY USING CIRC MODEL BASED LESSON STUDY

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Abstract: *Lesson Study is a major form of improving the quality of learning and professional development of teacher by reviewing the classroom learning process conducted by a group of teachers collaboratively in the long term and continuous. Lesson study in three stages, namely plan (planning), Do (implementation using a CIRC model), and See (reflection). The purpose of this study was to describe the increase in student learning activities and learning outcomes in science subjects by using CIRC model based lesson study. The technique of collecting data using interviews, documentation, testing, and observation. The results of analysis of the data showed on the stage of pre-cycle, cycle 1, and cycle 2 showed good activity deficits improve learning of 48.28%, 69.42%, and 71.14% or completeness of student learning outcomes 62.16%, 75.68%, and 83.78%. The conclusion from this study is that there is increased activity and learning outcome with CIRC model based lesson study.*

Keywords: *Activity Learning, Learning Outcome, CIRC Model, Lesson Study.*

1. INTRODUCTION

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.

Natural science is knowledge that systematics and formulated, related to material phenomenas and based on especially observation and deduction. Natural science is set of knowledge structured systematically, and in its use generally limited to natural phenomena. The development of it is not only marked by set of fact, but by there is scientific method and scientific attitude.

An integrated instructional model that can increase students' skill so that they're easier to communicate the material, more creative and critical in addressing and finishing the problem, also build students' character to act scientifically. One of instructional model that appropriate to that context is model from instructional strategy cooperative learning. Because cooperative learning demands students to be in groups that have heterogeneous member. In group will be stranded cooperation to get the purpose, so there is communication among students where the deficient students will get help from more capable students, and it will increase more capable students' skill for continually increasing their knowledge so it can be easy to transfer the information to their friends. One of instructional model used for creating fun learning activity is *Cooperative Integrated Reading and Composition* (CIRC) model.

According to Slavin (in Setyaningrum, 2012) the main objective of CIRC was to help the students to learn the skill to understand reading material so it can implemented widely. In CIRC the students are demanded to read then compose the matter or the problem given appropriate with their capability, explain to each other with the group member about what they think, searching the solution together with criticize and revise to each other, still got the final result then presented to another group and together with teacher make conclusion about matter or problem given. One of successful research in using CIRC model is the research from Prafitasari (2013) stated that 75.50%

students in understanding and interesting on science subject, and show the increasing of the sum of students learning outcome in the class.

But CIRC model also has weakness. The weakness of CIRC model is the students end to be crowded because divided into small groups, and not all students can make prediction and to present the idea clearly. Thus, the teacher has to be able to make planning carefully so it can minimize the sum of wasted time. Thus, in this research is done the reviewing to learning process begin with plan, do, and see with colleague friends. This weakness can be solved by Lesson Study.

Lesson Study is a main form of increasing the learning quality and professional teacher development with review the learning process in the class done by some teachers collaboratively in long term time and continually. Through Lesson Study it is developed the instruction that can encourage the students study actively, inovative, creaktive, and fun (Anggara, 2012).

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.

Lesson Study is not an instructional method or strategy, but it is activity that implements some instructional methods and strategies appropriate with situation, condition, instructional community skill and some problems faced in learning activity (Daryanto, 2012). According to Winarsih (2012) in Lesson Study there are three steps i.e. *Plan*, *Do*, and *See*. According to the research result from Mahmudi (2013) shown the lesson study activity can increase students' learning outcome. Thus, the researcher conducted class action research to measure activity increasing and science learning outcome using lesson study based model CIRC in state middle school (MTs Bustanul Ulum) Panti Jember.

The objectives of this paper are to describe the increasing of students' learning activity and to describe the increasing of science learning outcome in using lesson study based CIRC model for the students in state middle school (MTs Bustanul Ulum) Panti Jember.

2. METHOD OF RESEARCH

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. CIRC model is a method how the students to cooperate among them to form groups also with a teacher or lecturer in a learning process.

This research is classified in the form of PTK collaborative because it involves multiple parties, namely teachers, professors, and others involved into one team simultaneously conducted the study with three objectives: (1) improve instructional practices, (2) contribute to the development of the theory, and (3) increasing the teacher's career. The research design used in this study is a model Kemmis & Mc Taggart is a development of the basic concepts introduced Kurt Lewin, it's just acting and observing components used as a single entity since they are an integral action, occurred in the same time. Data acquisition instrument used in this study is the observation sheet activity and student learning outcomes in classical learning is said to be completed when $\geq 75\%$ of 37 students get a score ≥ 75 on the maximum score of 100.

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.

The technic of collecting data is interview, documentation, test, and observation. The interview is conducted by the subject teacher to know the students' character in the class. The documentation is the list of students' name and subject schedule. The test is *posttest*. The observasi is video recording and photo in learning.

3. RESULT AND DISCUSSION

Based on analysis result of instructional data using CIRC model shows there is increasing of activity and students' learning outcome among pre-cycle, cycle 1, and cycle 2. The of students' increasing of activity and leaning outcome are showed in Table 1.

Table 1. The of students' increasing of activity and leaning outcome.

No	Cycle	Activity Learning	Learning Outcome
1	Pre-Cycle	48.28%	62.16%
2	Cycle 1	69.42%	75.68%
3	Cycle 2	71.14%	83.78%

According to Table 1, there is increasing of students' science learning outcome in state middle school (MTs Bustanul Ulum) Panti Jember begin from Pre-cycle, cycle 1, and cycle 2. In pre-cycle, the average score of students' science learning outcome is 72.14% with mastery learning outcome classically is 62.16%. The mastery of learning outcome in pre-cycle can be said low because it is still below the classical minimum standard 75%. In cycle 1, the average score of students' science learning outcome is 81.90% with the mastery of learning classically is 75.68%. In cycle 2, the average score of students' science learning outcome is 83.24% with the mastery of learning outcome classically is 83.78%.

The implementation of instructional CIRC model goes on enough well and smooth. The student sare activein learning process. It is caused by group discussion the students do not only listen what explained by the teacher but they experience by themselves what learnt. So the instruction is student centered learning and meaningful. In this reseach, the instruction is helped by 5 observers for observing learning process.

According to analyzing data of instructionin pre-cycle, students' learning activity classically can be said godd and active i.e.range between 40% - 60%. While the percentage of students' learning outcome classically is 62.16% and not yet satisfy the minimum mastery criteria classically from Mts Bustanul Ulum Panti is $\geq 75\%$. The low result of student's learning outcome shows that the student's learning outcome is low.

Pre-cycle activity was done to know the students' early learning activity. But pre-cycle has not been done yet maximal, the students are still less involved active in learning activity. It is because there is not discussion activity among students whether group discussion o class discussion and the learning process is still teacher centered. So, the pre-cycle student's scienring outcome is still low.

Analyzing data on cycle 1, through the implementation CIRC model in instruction, shows there are the increasing students' science learning activity and learning outcome. Based on the result of analyzing data, learning activity increases from pre-cycle to cycle 1 i.e.from 48.28% to 69.42%. Also with students' mastery learning outcome increases from pre-cycle to cycle 1, i.e.from 62.16% to 75.68%. The increasing of mastery learning outcome shows that students' learning outcome also increases. The increasing of students' learning outcome is showed by *N-gain* value got from cycle 1 0.352 and including moderate criteria.

Learning activity in cycle 2 is conducted with same model in cycle 1 i.e. CIRC model. Based on the result of analyzing data in cycle 2, students' learning activity increases from 69.42% to 71.14%. The percentage of students' learning outcome result increases from 75.68% to 83.78%. The increasing percentage of students' learning outcome shows the increase. Based on *N-gain*

value got for students' learning outcome in cycle 2 i.e. 0,395, so the increasing of learning outcome include in moderate increasing criteria. The increasing of students' learning activity causes the learning outcome also increases.

The improvement of this learning outcome is caused by CIRC model gives opportunity to the students to share knowledge to each other with their friends in one group. In implementation CIRC model consist of small groups. Working in small group make student more active finishing the problem given by the teacher and all groups will get participated so that it can increase the students' science learning outcome.

Besides that, this learning improvement learning outcome caused by Lesson Study activity implemented in this research. Through Lesson Study, the researcher can improve the learning with review the learning has been done together with Lesson Study team. The development of increasing learning outcome average score proves that the implementation of CIRC model based Lesson Study can increase students' science subject learning outcome in state middle school (MTs Bustanul Ulum) Panti Jember.

4. CONCLUSION AND SUGGESTION

Based on result and discussion, so it can be made conclusion that there is increasing of activity and learning outcome on science subject in state middle school (MTs Bustanul Ulum) Panti Jember using Lesson Study based CIRC model.

The suggestion that can be given for the research is to need the readiness of teacher for accepting critics and suggestion to manage the class so that the learning activity can go on appropriate with what is expected. The skill of managing the class is as well as possible so that the learning activity can go on well, and the cooperation between model teacher and observer has to go on well so the implementation of lesson study can go on well.

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**Argumentasi Ilmiah Dan Kompetensi Pedagogik Mahasiswa
Pada Perkuliahan Dasar-Dasar Pendidikan Sains Dengan Pendekatan Kontekstual Berbasis
Lesson Study**

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Abstrak : Penelitian ini bertujuan untuk mendeskripsikan kemampuan argumentasi ilmiah dan kompetensi pedagogik mahasiswa pada perkuliahan dengan pendekatan kontekstual berbasis *lesson study*. Subjek penelitian adalah mahasiswa S1 Program Studi Pendidikan Biologi semester III yang mengambil mata kuliah Dasar-dasar Pendidikan Sains. Metode penelitian yang digunakan dalam penelitian ini adalah penelitian deskriptif. Penelitian dilakukan dengan tahapan pembelajaran kontekstual berbasis *lesson study* yang terdiri dari *plan*, *do* dan *see*. Teknik pengumpulan data yang digunakan yaitu teknik dokumentasi, observasi, questioner dan tes. Data yang diperoleh dianalisis secara deskriptif untuk mengetahui kemampuan argumentasi ilmiah dan kompetensi pedagogik mahasiswa. Berdasarkan hasil penelitian disimpulkan bahwa proses perkuliahan dengan pendekatan kontekstual berbasis *lesson study* memberikan dampak positif dalam membangun kualitas argumentasi mahasiswa calon guru sains. Model pembinaan *lesson study* yang diterapkan juga memperbaiki kualitas pembelajaran yang dilakukan oleh dosen dalam perkuliahan sehingga mampu meminimalisasi aktivitas mahasiswa yang tidak relevan dengan pembelajaran. Pembelajaran kontekstual berbasis *lesson study* dalam penelitian ini juga mampu menginisiasi kompetensi pedagogik mahasiswa calon guru dalam merencanakan pembelajaran sains yang relevan dengan hakikat sains. Melalui pembelajaran kontekstual berbasis *lesson study* mahasiswa telah mampu merencanakan pembelajaran sains yang melibatkan aspek produk, dan Proses/ Sikap sains, meskipun mereka belum mendapatkan pengetahuan tentang model/metod/ strategi dalam pembelajaran sains yang bermakna.

Kata kunci : Argumentasi Ilmiah, Kompetensi Pedagogik, Pendekatan Kontekstual, *Lesson Study*

1. PENDAHULUAN

Pembelajaran sains pada hakikatnya bukanlah suatu kegiatan pasif dalam rangka mentransfer pengetahuan, melainkan suatu proses aktif yang melibatkan siswa untuk berfikir bagaimana konsep ilmiah itu diperoleh dan diaplikasikan untuk mengatasi masalah dalam kehidupan sehari-hari. *National Research Council* (NRC) mengemukakan bahwa pembelajaran sains seharusnya melibatkan siswa dalam proses kognitif yang melambangkan cara berfikir para saintis seperti mengajukan pertanyaan yang berorientasi ilmiah, mencari sejumlah bukti sebagai respon terhadap pertanyaan, menyusun penjelasan berdasarkan bukti yang diperoleh, menghubungkan penjelasan dengan pengetahuan ilmiah, serta mengkomunikasikan dan membuktikan penjelasan (NRC, 2000, dalam Dolan & Grady, 2010). Kelas sains yang identik dengan kegiatan para saintis seperti mengobservasi, melakukan eksperimen, bahkan berdiskusi ilmiah seharusnya dapat menjadikan siswa sebagai subjek belajar yang aktif, sehingga kegiatan-kegiatan tersebut dapat memicu proses berpikir siswa dan juga memberikan pengalaman yang bermakna.

Keterlibatan siswa dalam proses kognitif sangat penting untuk melatih siswa sehingga mereka mampu melek sains. Melek sains atau yang dikenal juga dengan istilah literasi sains sebagai tujuan pembelajaran meliputi pemahaman siswa tentang hakikat sains dan juga penalaran ilmiah (*scientific reasoning*) siswa (Lawson, 2009, dalam Piraksa, Srisawasdib, & Koulc, 2014). Pendidikan Sains sebagai bagian dari Pendidikan, berperan penting untuk menyiapkan peserta didik yang melek sains, yaitu yang mampu berpikir kritis, kreatif, logis, dan berinisiatif dalam menanggapi isu di masyarakat yang diakibatkan oleh dampak perkembangan IPA dan teknologi (Prayekti, 2006).

Penelitian Rubini dan Ardianto (2014) tentang capaian literasi sains siswa khususnya di Kota Bogor pada tahun 2014 menunjukkan bahwa capaian literasi sains siswa di Kota Bogor masih belum menunjukkan hasil yang memuaskan. Hasil capaian literasi sains siswa SMP di Kota Bogor hampir menunjukkan perolehan yang sama dengan capaian literasi sains siswa nasional. Data menunjukkan

capaian literasi sains siswa di Kota Bogor cukup rendah, dengan rata-rata sekitar 30% untuk keseluruhan aspek, yang terdiri atas 29% untuk konten, 30% untuk proses, dan 31% untuk konteks.

Rendahnya kualitas pendidikan sains dianggap sebagai salah satu penyebab belum memuaskannya literasi sains siswa. Permasalahan utama dalam pembelajaran sains yang sampai saat ini belum mendapat pemecahan secara tuntas adalah adanya kesenjangan atau ketidaksesuaian antara pembelajaran sains di sekolah dengan hakikat atau esensi sains. Kesenjangan inilah yang menyebabkan rendahnya prestasi sains siswa (Firman, 2007). Hasil pengamatan di lapangan berkaitan dengan pelaksanaan pembelajaran sains masih didominasi dengan penjejalan konsep sains kepada para siswa. Guru sains seringkali mengeluhkan permasalahan klasik kurangnya waktu dan fasilitas untuk melaksanakan pembelajaran IPA dengan menerapkan strategi pembelajaran sains yang menjadi tuntutan kurikulum. Ketika ditanyakan apakah dilakukan kegiatan praktikum atau observasi objek sains saat pembelajaran, jawabannya, tidak cukup waktu untuk melakukan hal tersebut. Hal ini mengindikasikan pelaksanaan praktikum atau observasi, oleh para guru sains dianggap sebagai kegiatan tambahan yang sifatnya boleh dilakukan kalau ada waktu. Padahal strategi pembelajaran seperti itulah yang seharusnya diterapkan dalam pembelajaran sains. Uraian tersebut mengindikasikan bahwa kompetensi pedagogik guru sains yang masih belum maksimal, baik itu dalam hal konteks sains, maupun cara membelajarkan sains kepada siswanya.

Kompetensi guru sains dalam membelajarkan sains sangat dipengaruhi oleh kemampuannya untuk bernalar terhadap bukti-bukti yang diperoleh serta berpartisipasi dalam argumentasi ilmiah untuk mengembangkan proses penalaran dan memicu berpikir kritis (Bekiroglu & Eskin, 2012). Dalam pembelajaran sains, argumentasi ilmiah merupakan salah satu keterampilan yang berperan penting, karena argumen ini terlibat dalam proses menganalisis/ memecahkan masalah, mengintegrasikan/ mensintesis bagian-bagian, merancang/ merencanakan percobaan, menarik kesimpulan, membuat generalisasi, mengevaluasi dan membuktikan, serta mengaplikasikan kapasitas-kapasitas ini kedalam masalah-masalah yang tidak biasa (TIMSS, 2007, dalam Waldrip, 2012), selain itu, argumentasi ilmiah juga memiliki peranan penting dalam perbaikan pembelajaran sains, Argumentasi ilmiah juga telah dipertimbangkan sebagai tujuan utama perbaikan pendidikan sains (American Association for the Advancement of Science, 1993; National Research Council, 1996, dalam Furtak, *et al.*, 2008). Uraian tersebut dapat diabstraksikan bahwa kemampuan argumentasi ilmiah seorang guru merupakan aspek yang berkaitan dengan kualitas guru dalam membelajarkan sains. Oleh karena itu, untuk memperbaiki kualitas pembelajaran sains dan prestasi sains siswa, perlu dilakukan upaya pembangunan kompetensi pedagogik dan argumentasi ilmiah calon guru sains sejak dini melalui proses pembelajaran di bangku kuliah.

Pembelajaran yang potensial untuk mengatasi masalah yang diuraikan di atas adalah pembelajaran kontekstual berbasis *lesson study*. Pembelajaran Kontekstual merupakan konsep belajar yang mengaitkan materi yang diajarkan dengan realitas sehingga mahasiswa dapat membuat hubungan antara pengetahuan yang dimiliki dengan penerapannya *lesson study*. Pendekatan kontekstual ini mendorong untuk mengkaitkan antara pengetahuan yang dimiliki dengan penerapan dalam kehidupan sebagai anggota keluarga dan masyarakat. Pembelajaran dengan pendekatan kontekstual melibatkan tujuh komponen utama, yaitu (1) *Constructivism* (konstruktivisme, membangun, membentuk), (2) *inquiry* (menemukan); (3) *questioning* (bertanya); (4) *learning community* (masyarakat belajar); (5) *modeling* (pemodelan), (6) *relection* (refleksi atau umpan balik); (7) *authenticassesment* (penilaian yang sebenarnya). Konsep pembelajaran kontekstual tersebut dapat memacu mahasiswa untuk belajar langsung secara alamiah dalam bentuk kegiatan mengalami dan kerjasama, bukan transfer pengetahuan dari dosen ke mahasiswa.

Lesson study merupakan suatu model pembinaan profesi pendidik melalui pengkajian pembelajaran secara kolaboratif dan berkelanjutan berdasarkan pada prinsip-prinsip kolegalitas oleh sekelompok guru (dosen) untuk membangun sebuah komunitas belajar (*learning community*). Hasil dari kegiatan diharapkan dapat menemukan strategi yang dapat disesuaikan dengan situasi dan kondisi serta permasalahan yang dihadapi guru (dosen) pada proses pembelajaran dengan pendekatan kontekstual.

2. METODOLOGI PENELITIAN

Penelitian dengan metode deskriptif ini dilaksanakan pada semester gasal tahun akademik 2015-2016 pada bulan Oktober sampai dengan Desember 2015 di Program Studi Pendidikan Biologi Fakultas Keguruan dan Ilmu Pendidikan Universitas Pakuan. Adapun yang menjadi obyek penelitian ini adalah mahasiswa semester III yang mengambil mata kuliah Dasar-Dasar Pendidikan Sains, dengan materi yang digunakan yaitu Hakikat Sains.

Pelaksanaan penelitian dilakukan secara kolaboratif dan kolekatif sesama dosen dalam tim dan melibatkan dosen lain yang berperan sebagai observer atau pengamat. Hal ini dimaksudkan untuk membudayakan spirit kolaborasi dan bekerjasama dengan prinsip terbuka saling memberi dan menerima untuk meningkatkan kualitas pembelajaran.

Pengumpulan data dilakukan dengan teknik dokumentasi, observasi, pemberian kuesioner dan tes. Instrumen yang digunakan berupa lembar observasi, angket dan soal essay. Pada masing-masing kelas dilaksanakan dengan tahapan *Lesson Study* yaitu *Plan, Do* dan *See*. Untuk mengetahui kemampuan argumentasi ilmiah dan kompetensi pedagogik mahasiswa digunakan soal essay dengan rubrik penilaian.

Tingkatan argumentasi mahasiswa berdasarkan komponen argumennya dianalisis menggunakan rubrik yang dikemukakan Dawson & Venville (2009) yang dimodifikasi seperti pada tabel 1 berikut.

Tabel 1. Rubrik untuk mengukur tingkatan komponen argument mahasiswa

Level	Deskripsi
1	Hanya mengandung <i>claim</i> .
2	Mengandung <i>claim</i> dan <i>data</i> , dan/ atau terdapat <i>warrant</i> .
3	Mengandung <i>claim</i> , <i>data</i> , <i>warrant</i> , dan <i>backing/qualifier/rebuttal</i> .
4	Mengandung <i>claim</i> , <i>data</i> , <i>warrant</i> , <i>backing</i> , dan <i>qualifier/rebuttal</i> .
5	Mengandung semua komponen argumentasi: <i>claim</i> , <i>data</i> , <i>warrant</i> , <i>backing</i> , <i>qualifier</i> , dan <i>rebuttal</i> .

Sedangkan untuk kompetensi pedagogik yang di tes adalah kemampuan merancang rencana pembelajaran yang relevan dengan hakikat sains. Skor 3 untuk rancangan pembelajaran yang berelevansi dengan sains sebagai produk, sikap ilmiah dan proses, skor 2 untuk rancangan pembelajaran yang berelevansi dengan sains sebagai produk, sikap ilmiah atau proses, dan skor 1 untuk rancangan pembelajaran yang hanya berelevansi dengan sains sebagai produk.

Data yang diperoleh kemudian diolah untuk mengetahui persentase dari setiap level. Banyaknya argumen ilmiah dan kompetensi pedagogik mahasiswa untuk setiap level di setiap kelas selanjutnya dihitung dalam bentuk persen menggunakan rumus yang dikemukakan oleh Purwanto (2010) sebagai berikut.

$$NP = \frac{R}{SM} \times 100\%$$

Keterangan:

NP = Nilai persen yang dicari atau diharapkan

R = Skor mentah yang diperoleh (dalam penelitian ini: jumlah argumen yang muncul pada tingkat level yang ditentukan)

SM = Skor maksimum ideal yang diharapkan (dalam penelitian ini: jumlah total argument mahasiswa di kelas yang ditentukan)

3. HASIL DAN PEMBAHASAN

Kegiatan *Lesson study* dipilih dan diimplementasikan dalam rangka peningkatan profesionalitas pendidik karena *lesson study* merupakan suatu cara efektif untuk meningkatkan kualitas belajar dan

mengajar di kelas, mengingat pengembangan *lesson study* dilakukan dan didasarkan pada hasil “*sharing*” pengetahuan profesional yang berlandaskan pada praktek dan hasil pembelajaran yang dilaksanakan.

A. Pelaksanaan Tahapan *Lesson Study*

Lesson Study merupakan salah satu upaya untuk meningkatkan proses dan hasil pembelajaran yang dilakukan berdasarkan tahapan-tahapan secara siklik, yang terdiri dari: (1) perencanaan (*plan*); (2) pelaksanaan (*do*); (3) refleksi (*see*).

1. Plan

Pada tahapan *plan* dilakukan diskusi untuk menyusun *Chapter Design* dan *Lesson Plan* sebelum dilaksanakan tahapan *do* yaitu *Open Lesson*. Pembahasan mengenai waktu pelaksanaan dan dosen model pun didiskusikan pada tahapan ini. Berikut adalah waktu pelaksanaan *lesson study* dan dosen model berdasarkan hasil kegiatan *Plan* yang telah dilakukan :

Tabel 2. Jadwal Pelaksanaan *Lesson Study*

Siklus	Tanggal/Pukul	Tempat	Dosen Model
1	Selasa, 03 November 2015 Pukul 08.00 - 09.40	FKIP B 3.1	Suci Siti Lathifah, M.Pd
2	Kamis, 05 November 2015 Pukul 08.00 – 09.40	PPs 3.5	Didit Ardianto, M.Pd
3	Kamis, 05 November 2015 Pukul 13.00 – 15.10	Laboratorium 1	Dr. Nandang Hidayat, M.Pd
4	Jumat, 06 November 2015 Pukul 10.00 – 11.40	FKIP A 2.6	Suci Siti Lathifah, M.Pd

Pada tahap ini penyusunan *chapter design* dan *lesson plan* berdasarkan identifikasi masalah di kelas yang akan digunakan untuk kegiatan *lesson study* dan perencanaan alternatif pemecahannya, misalnya pemilihan materi pelajaran, pemilihan metode dan media yang sesuai dengan karakteristik mahasiswa, jenis evaluasi yang akan diterapkan, dan sebagainya. Saran-saran dari para observer yang disampaikan pada tahapan *see* menjadi focus diskusi juga untuk peningkatan kualitas pembelajaran pada siklus selanjutnya. Adapun langkah-langkah kegiatan perkuliahan yang disusun sesuai dengan pendekatan kontekstual adalah sebagai berikut :

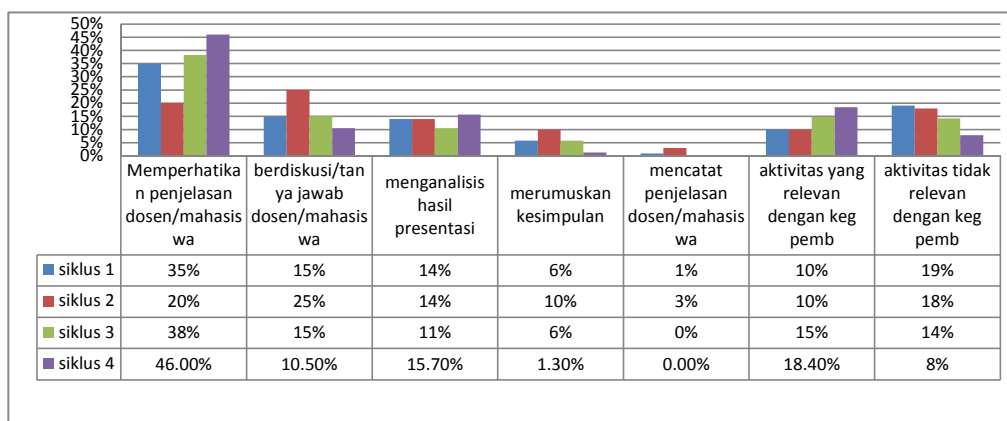
Tabel 3. Langkah-langkah Kegiatan Perkuliahan

Tindakan Mahasiswa	Bantuan/Perhatian Dosen
1. Mahasiswa menyimak pertanyaan dari dosen dan perwakilan mahasiswa menjawab pertanyaan dari dosen	1. Menanyakan materi sebelumnya mengenai pengertian sains dan hakikatnya
2. Mahasiswa duduk dalam kelompoknya yang heterogen	2. Dosen membagikan mahasiswa ke dalam 6 kelompok yang heterogen
3. Mahasiswa mempresentasikan hasil observasi proses pembelajaran sains di sekolah secara berkelompok	3. Dosen meminta mahasiswa untuk mempresentasikan hasil observasi proses pembelajaran sains di sekolah.
4. Perwakilan kelompok menanggapi presentasi kelompok yang lainnya	4. Dosen meminta mahasiswa lain untuk menanggapi presentasi yang dilakukan oleh presenter.
5. Perwakilan dari kelompok secara bergantian menjelaskan hasil diskusinya di depan kelas	5. Dosen memberikan penjelasan mengenai hasil diskusi yang telah disampaikan oleh mahasiswa

<p>6. Secara bersama-sama menyimpulkan materi yang telah disampaikan</p> <p>7. Mahasiswa secara individu dan jujur mengerjakan tes formatif tertulis</p>	<p>6. Dosen bersama-sama dengan mahasiswa menyimpulkan materi yang telah disampaikan</p> <p>7. Dosen membagikan tes formatif</p> <p>Evaluasi:</p> <p>1. Relevansi proses pembelajaran sains dengan hakikat sains</p> <p>Bantuan:</p> <p>Membaca materi yang belum dipahami oleh Mahasiswa dan menanyakan kembali kepada mahasiswa yang telah memahami materi</p>
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2. Do

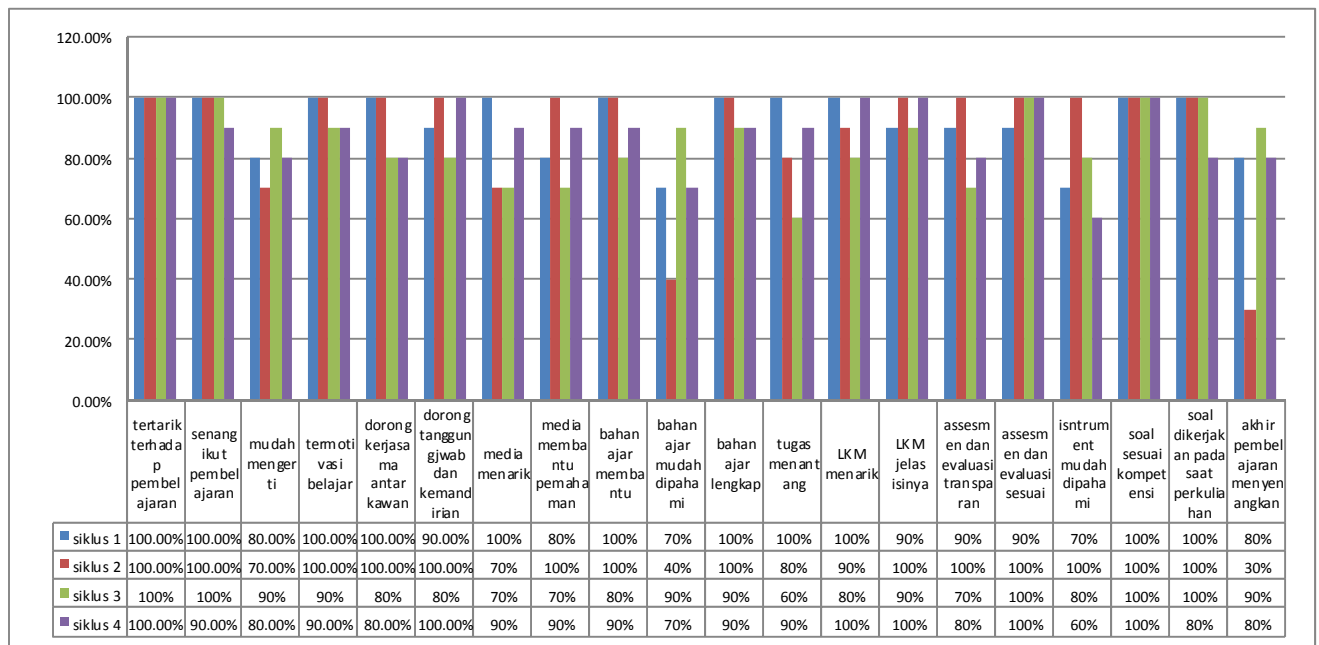
Pada kegiatan *do* dosen model melakukan proses pembelajaran berdasarkan perencanaan yang didiskusikan bersama dengan mempertimbangkan berbagai rekomendasi dari proses refleksi siklus sebelumnya. Pada tahapan *do* kegiatan pembelajaran yang dilakukan oleh dosen model dipantau oleh para observer untuk mengetahui aktivitas yang dilakukan oleh mahasiswa selama proses perkuliahan berlangsung. Berikut ini tabel persentase aktivitas mahasiswa dengan menggunakan pendekatan kontekstual untuk setiap siklusnya :



Gambar 1. Rekapitulasi Data Aktivitas Mahasiswa

2. See

Pada tahap *see* dilakukan refleksi terhadap proses pembelajaran yang telah dilakukan dengan melibatkan observer. Setiap masukan yang diberikan oleh observer menjadi bahan diskusi untuk perbaikan kegiatan perkuliahan selanjutnya. Dengan demikian diharapkan dapat diperoleh strategi yang tepat dalam penerapan pendekatan kontekstual pada perkuliahan konsep hakikat sains. Selain itu untuk mengetahui sejauh mana efektivitas pelaksanaan perkuliahan berbasis *lesson study* diberikan juga kuesioner kepada mahasiswa. Berikut ini hasil kuesioner yang telah diisi oleh mahasiswa untuk setiap siklusnya :



Gambar 2. Persentase hasil jawaban mahasiswa dari pernyataan angket

Berdasarkan grafik tersebut dapat disimpulkan bahwa mahasiswa merasakan efektivitas pelaksanaan perkuliahan dengan pendekatan kontekstual. Hal ini didukung dengan rata-rata lebih dari 80% pernyataan positif dari mahasiswa. Banyaknya pernyataan positif siswa dalam angket ini dikarenakan pelaksanaan perkuliahan dengan pendekatan kontekstual pada konsep hakikat sains ini dilakukan dengan berkelompok, dan setiap kelompok diberikan LKM yang menantang mereka untuk mendapatkan informasi mengenai kegiatan pembelajaran sains yang dilakukan di sekolah secara langsung.

Mahasiswa sebenarnya lebih banyak belajar dari teman yang satu ke yang lain daripada dosennya. Arends (2004) mengungkapkan bahwa masyarakat belajar dapat Untuk itu konsekuensinya dalam kelas CTL, sangat disarankan sekali melaksanakan pembelajaran dalam kelompok-kelompok belajar atau membentuk masyarakat belajar. Praktiknya masyarakat belajar dalam pembelajaran terwujud dalam: (1) pembentukan kelompok kecil dan besar, (2) mendatangi/mengunjungi “ahli” (tokoh, olahragawan, dokter, petani, pedagang, pengusaha, peternak, pengurus organisasi masyarakat/parpol, polisi, tentara, tukang kayu, ilmuwan, dan sebagainya), (3) bekerja dengan kelas sederajat, (4) bekerja dengan masyarakat, dan sebagainya. Karena itu pembelajaran menjadi lebih bermakna, karena apa yang mereka pelajari berguna bagi profesinya nanti. Mereka sadar, apa yang dipelajarinya bermanfaat bagi dirinya dan berusaha untuk belajar lebih baik. Proses pembelajaran lebih “hidup” dan lebih bermakna, karena pembelajarannya lebih alamiah dan mengalaminya sendiri. Konteks pembelajaran dapat memberikan arti, relevansi dan manfaat penuh terhadap belajar (Johnson, 2002).

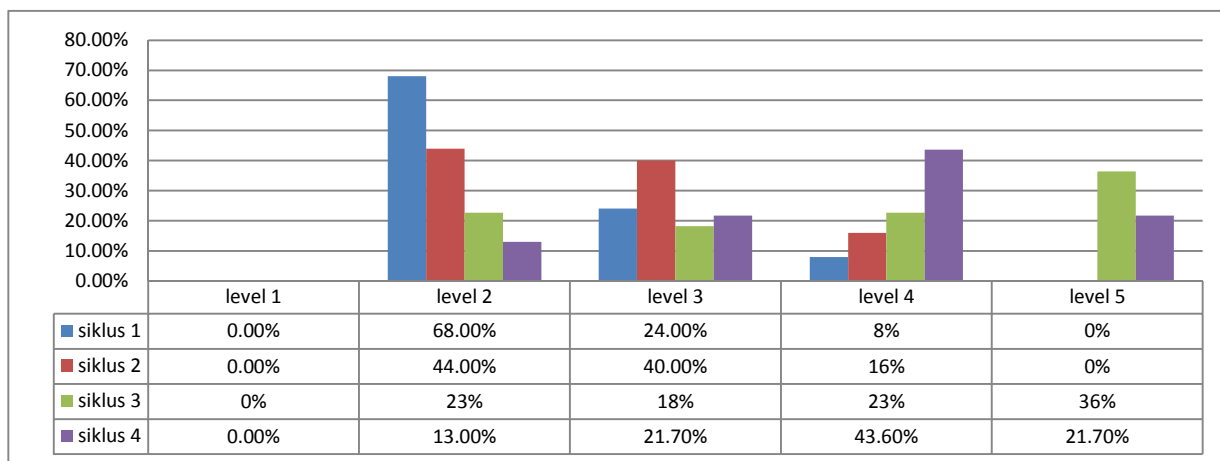
B. Kemampuan Argumentasi Ilmiah

Proses argumentasi adalah proses yang digunakan seseorang untuk menganalisis informasi tentang suatu topik dan kemudian hasil analisisnya dikomunikasikan kepada orang lain. Seseorang yang terlibat argumentasi bertujuan untuk mencari pembenaran terhadap keyakinannya, sikapnya, dan nilai sehingga dapat mempengaruhi orang lain. Berdasarkan framework ini suatu argumentasi dipandang kuat apabila mengandung keenam komponen tersebut (Sampson, 2008, dalam Roshayanti, 2012) yaitu : (1) *Data* sinonim dengan istilah bukti, yang didefinisikan sebagai fakta atau kondisi yang secara objektif dapat diamati, kepercayaan, atau premis yang diterima kebenarannya oleh *audience*, atau kesimpulan yang sebelumnya telah dibangun (Inch, Warnick, & Endres, 2006). Data yang tersusun atas fakta atau

bukti ini berperan sebagai dasar dalam mendukung *claim* (Verheij, 2005; Simosi 2003), (2) *Claim* merupakan pernyataan yang mengandung struktur dan ditunjukkan sebagai hasil (*outcome*) argumen (Simosi, 2003). Dengan kata lain, klaim tersusun atas opini yang terekspresikan atau kesimpulan yang diinginkan pendebat agar diterima (Inch, et al., 2006), (3) *Warrant* mengekspresikan penalaran yang digunakan untuk menghubungkan data dengan klaim. Menurut Toulmin (Inch, et al., 2006), jika data menjawab pertanyaan, “informasi apa yang kamu punya untuk sampai ke kesimpulan?”, lalu *warrant* menjawab pertanyaan, “bagaimana kamu memahaminya dari data tersebut?”. *Warrant* bisa berupa ungkapan yang digunakan sebagai aturan, prinsip, atau lisensi-inferensi yang berperan sebagai jembatan antara data dan *claim*.

Warrant mengindikasikan relevansi data terhadap *qualifier claim* (Simosi, 2003), (4) *Backing* merupakan asumsi yang mendukung *warrant*, bisa berupa informasi faktual (seperti observasi yang dilakukan di masa lalu), atau prinsip, nilai atau kepercayaan dari konteks sosial, lingkungan organisasi, atau pengalaman sebagai seorang individu (Simosi, 2003). *Backing* tersusun atas fakta atau penalaran lebih jauh yang digunakan untuk mendukung atau melegalkan prinsip-prinsip yang terkandung dalam *warrant* (Inch, et al., 2006). (5) *Qualifier* secara sederhana dijelaskan sebagai jenis operator modal suatu pernyataan. Sehingga, *qualifier* Toulmin dapat dipertimbangkan sebagai bagian dari pernyataan yang mengekspresikan *claim* yang didukung oleh data (Verheij, 2005). Penjelasan lain (Inch, et al., 2006) menyebutkan bahwa merupakan *phrase* kata keterangan (*adverbial phrase*) yang memodifikasi *claim* dan mengindikasikan kekuatan rasional pendebat terhadap *claim* tersebut, (6) *Rebuttal* melibatkan kondisi pengecualian untuk argumen. Alasan-alasan yang melawan pernyataan dapat dilihat sebagai jenis *rebuttal* sebuah argumen yang tersusun atas *warrant*, *data*, dan *claim* (Verheij, 2005). Istilah lain *rebuttal* dalam struktur Toulmin yaitu *reservation*, yang berarti pengecualian terhadap aturan yang diekspresikan pada *warrant*, sehingga *reservation* ini menyatakan keadaan atau kondisi yang meruntuhkan argumen (Inch, et al., 2006).

Berdasarkan aspek kelengkapan komponen argumen, maka argumen mahasiswa dikelompokkan menjadi level 1 hingga level 5 berdasarkan rubrik Dawson dan Venville (2009) yang dimodifikasi (Tabel 1). Hasil analisis argumen mahasiswa selama proses perkuliahan dengan pendekatan kontekstual berbasis *lesson study* dapat dilihat pada gambar 3 berikut ini.



Gambar 3. Persentase Kemampuan Argumentasi Ilmiah Mahasiswa

Hasil analisis terhadap argumen mahasiswa berdasarkan aspek kelengkapan komponen argumen sebagaimana disajikan pada Gambar 3 menunjukkan bahwa sebagian besar argumen mahasiswa pada siklus 1 dan siklus 2 berada pada level 2. berada pada level 2, yang berarti mahasiswa hanya mampu mengajukan *claim* yang dilengkapi dengan *data* dan/atau *warrant* tanpa dilengkapi dengan *backing*, *qualifier*, dan *rebuttal*. Mahasiswa belum mampu melengkapi argumennya dengan *backing*, *qualifier*, atau bahkan *rebuttal*. Sehingga, pada Gambar 3. juga dapat dilihat bahwa tidak ada satupun argumen mahasiswa yang berada pada level 5 (mengandung semua komponen argumen).

Jarangnya mahasiswa mengajukan komponen argumen *backing*, *qualifier*, dan terutama *rebuttal* juga terjadi pada penelitian Osborne *et al.* (Dawson & Venville, 2009) bahwa mahasiswa jarang mengekspresikan *rebuttal* saat berargumen khususnya ketika argumen tersebut diungkapkan melalui permasalahan yang diberikan di kelas. Padahal, kehadiran *rebuttal* merupakan indikator yang signifikan terhadap kualitas argumentasi, karena *rebuttal* mendorong partisipan untuk mengevaluasi validitas dan kekuatan dari argumen tersebut (Erduran, 2008, dalam Bekiroglu & Eskin, 2012). Meskipun sebagian besar argumen mahasiswa dalam penelitian ini hanya tersusun atas tiga komponen (*claim*, *data*, *warrant*), tetapi menurut Inch *et al.* (2006), komponen *claim*, *data*, dan *warrant* merupakan komponen yang paling penting diantara keenam komponen argumen lainnya, sehingga ketiga komponen ini merupakan komponen yang harus muncul dalam setiap argumen.

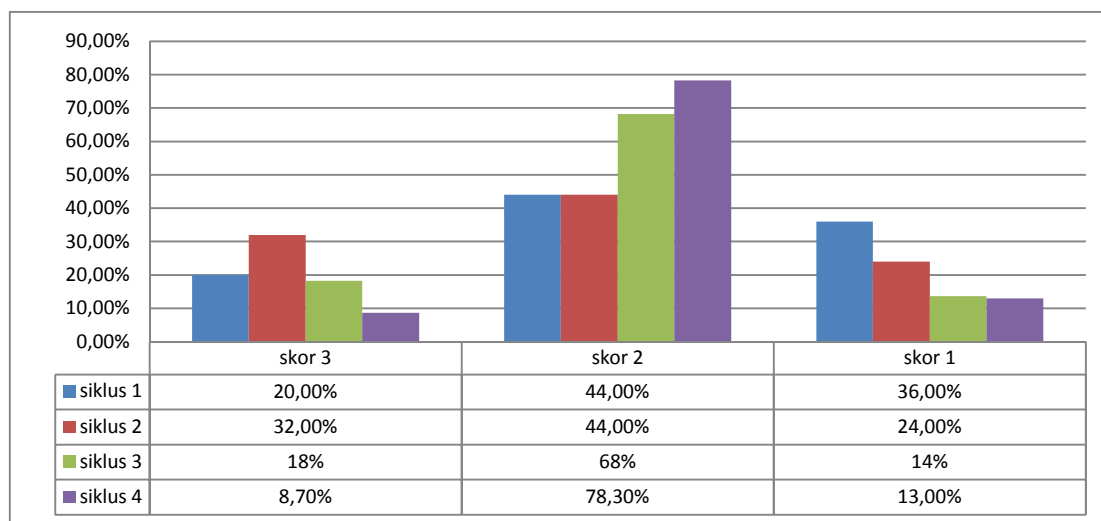
Banyaknya argumen mahasiswa yang berada pada level 2 juga serupa dengan hasil penelitian Dawson dan Venville (Dawson & Venville, 2010). Penelitian tersebut menunjukkan bahwa sebagian besar siswa (75%) (tanpa memperhatikan usia) mengekspresikan argumen level rendah yang hanya tersusun atas *claim* atau hanya *claim* dan *data*. Sementara *warrants*, *backings*, dan *qualifiers* jarang sekali muncul. Hasil yang sama juga diungkapkan oleh Ekanara (2013), yang melakukan penelitian pada siswa kelompok budaya Sunda, bahwa sebagian besar argumen siswa berada pada level 2 (*claim*, *data*, dan/ atau *warrant*) dan level 3 (*claim*, *data*, *warrant*, *backing/qualifier*).

Hasil analisis argumen yang diperlihatkan pada Gambar 3, juga menunjukkan bahwa pada siklus 4 dan 5, sebagian besar argumen mahasiswa berada pada level 4 dan 5. Hal ini mengindikasikan bahwa mahasiswa selain mengajukan *claim* yang dilengkapi dengan *data* dan/atau *warrant* juga dilengkapi dengan *backing*, *qualifier*, dan *rebuttal*. Banyaknya argumen mahasiswa pada level 4 dan 5 karena pada siklus 4 dan 5 dosen telah memperbaiki proses pembelajaran sesuai dengan hasil refleksi yang dilakukan pada tahap *see Lessos Study*. Selain itu, berdasarkan hasil pengamatan aktivitas mahasiswa, terjadi peningkatan pada aktivitas memperhatikan penjelasan dosen/mahasiswa ketika proses perkuliahan, serta menurunnya aktivitas mahasiswa yang tidak relevan dengan kegiatan pembelajaran. Hasil pengamatan aktivitas tersebut mengindikasikan bahwa selama proses perkuliahan mahasiswa sudah mulai terlibat dalam proses bernalar dan berpikir untuk memecahkan permasalahan yang diangkat dalam proses pembelajaran. Perbaikan pola pembelajaran kontekstual yang dilakukan dari siklus ke siklus juga memberikan pengaruh positif terhadap kualitas argumen mahasiswa. Proses pembelajaran pada siklus 4 dan 5, mahasiswa diminta tidak hanya sekedar mengajukan *claim*, *data* dan *warrant* saja tetapi mahasiswa juga diminta untuk memberikan solusi terhadap masalah melalui Proses pembelajaran yang demikian memberikan kesempatan kepada mahasiswa melibatkan keterampilan berpikir dan penalaran ilmiahnya, sehingga secara tidak langsung berdampak pada kualitas argumen yang dimunculkan.

Uraian tersebut dapat disimpulkan bahwa aktivitas pembelajaran memang memiliki peran penting dalam membangun argumentasi mahasiswa. Pentingnya aktivitas pembelajaran terhadap kemampuan bernalar siswa melalui argumentasi juga diungkapkan oleh Klahr *et al.* (Varma, 2014) bahwa kebiasaan untuk mengungkapkan bukti, alasan, serta pendukung lain yang benar dan logis dapat dilatihkan terutama saat aktivitas pembelajaran, sehingga seorang guru harus dapat mempertimbangkan jenis aktivitas dan juga kemampuan kognitif peserta didik untuk mendukung penalaran ilmiahnya.

C. Kompetensi Pedagogik

Kompetensi pedagogik mahasiswa calon guru yang diukur pada penelitian ini adalah keterampilan mahasiswa dalam merancang kegiatan pembelajaran sains yang relevan dengan hakikat sains. Keterampilan mahasiswa dalam merancang pembelajaran sains dalam skdapat dilihat pada Gambar 4 berikut ini.



Gambar 4. Persentase Kompetensi Pedagogik Mahasiswa

Gambar 4 memperlihatkan kepada kita bahwa sebagian besar mahasiswa memperoleh skor 2 dalam merancang pembelajaran sains yang sesuai dengan hakikatnya. Hal ini berarti bahwa sebagian besar mahasiswa belum sepenuhnya bisa merencanakan pembelajaran sains yang sesuai dengan haikat sains. Rencana pembelajaran yang dibuat oleh mahasiswa belum melibatkan 3 ranah dalam sains, yaitu Produk, Proses dan Sikap. Sebagian besar mahasiswa hanya melibatkan ranah Produk, dan Proses/Sikap sains dalam rancangan pembelajarannya.

Ketidakmaksimalan mahasiswa dalam merancang pembelajaran sains sesuai dengan haikatnya dalam penelitian ini disebabkan oleh beberapa faktor. Faktor yang pertama yaitu mahasiswa belum mendapatkan pengetahuan tentang model/metode/strategi pembelajaran sains yang sesuai dengan hakikatnya, sehingga mahasiswa terlihat bingung ketika diminta untuk merancang pembelajaran sains yang relevan dengan hakikatnya. Faktor yang kedua yaitu mahasiswa tidak mendapatkan contoh praktek pembelajaran sains yang relevan dengan hakikat sains, sebagian besar mahasiswa hanya melihat contoh pembelajaran yang mereka dapatkan dari hasil observasi pembelajaran sains di lapangan yang masih belum mencerminkan pola pembelajaran sains yang bermakna.

Hal ini sesuai dengan yang dikemukakan oleh Sujana (2010) bahwa hasil belajar adalah kemampuan-kemampuan yang dimiliki siswa setelah ia menerima pengalaman belajarnya. Menurut Purwanto (2011) hasil belajar adalah perolehan yang didapatkan seseorang dalam bentuk perubahan perilaku setelah mengalami belajar.

4. KESIMPULAN

Berdasarkan uraian hasil dan pembahasan diatas dapat disimpulkan bahwa proses perkuliahan dengan pendekatan kontekstual berbasis *lesson study* memberikan dampak positif dalam membangun kualitas argumentasi mahasiswa calon guru sains. Model pembinaan *lesson study* yang diterapkan juga memperbaiki kualitas pembelajaran yang dilakukan oleh dosen dalam perkuliahan sehingga mampu meminimalisasi aktivitas mahasiswa yang tidak relevan dengan pembelajaran. Pembelajaran kontekstual berbasis *lesson study* dalam penelitian ini juga mampu menginisiasi kompetensi pedagogik mahasiswa calon guru dalam merencanakan pembelajaran sains yang relevan dengan hakikat sains. Melalui pembelajaran kontekstual berbasis *lesson study* mahasiwa telah mampu merencanakan pembelajaran sains yang melibatkan aspek produk, dan Proses/ Sikap sains, meskipun mereka belum mendapatkan pengetahuan tentang model/metode/ strategi dalam pembelajaran sains yang bermakna.

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Implementation Of Integrater Character That Learning Disobey Chemistry And Biology Is Lesson Study Base Because Of Conctructive Intelligence Student

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SMA Parigi Moutong dan SMA Kota Palu.

Abstract: The front side problem an Indonesian moment is learned quality and student power competition is low. Most important therefore is not enough professional teaching in the quality learned to perform. The aim activity is to implementation integraterd character that learning disobey chemistry and biology is *LS* base of constructive intelligence student SMA Parigi Moutong and SMA Kota Palu. The methods of performance is compared training to organize, to plan, dan do base *LS* integrated character learned. Siclus implementation iaplan, *do/open class*, and *see/reflection* and in a negotiation. Result is to be found are respectively 40 chemistry teacher person and 30 biology teacher person at SMA Parigi Moutong and SMA Kota Palu can plan, *do/open class* integrated character disobey *Lesson study*. Indicator one of something or the other is chemistry teacher and biology teacher can be to apper as model teacher and as observer. Sentence expretion that sentence at moment reflection/see very bright at all to guide for always to pay attention to difficulty student learned successful all student until. Because of learned that performance more to have a meaning.

Key word : Integrated character, Learning, Lesson study, and intelligence

Abstrak : Problema yang dihadapi Indonesia adalah kualitas pendidikan dan daya kompetitif siswa yang rendah. Penyebab utama adalah guru kurang profesional dalam melaksanakan pembelajaran yang berkualitas. Tujuan kegiatan ini adalah mengimplementasikan karakter terpadu melalui pembelajaran berbasis *Lesson Study (LS)* pada pembelajaran kimia dan biologi untuk membangun kecerdasan siswa SMA Parigi Moutong dan SMA Kota Palu. Metode pelaksanaannya adalah melaksanakan pelatihan menyusun, merancang, dan melaksanakan pembelajaran berkarakter terpadu berbasis *LS*. Siklus pelaksanaannya adalah *plan* (perencanaan pelaksanaan pembelajaran), *do/open class* (buka kelas), dan *see* (refleksi) pelaksanaan pembelajaran dan pendampingan. Hasil yang diperoleh adalah masing 40 orang guru kimia dan 30 orang guru biologi di SMA Parigi Moutong dan SMA Kota Palu dapat merancang dan melaksanakan pembelajaran karakter terpadu melalui *lesson study*. Salah satu indikatornya adalah Guru kimia dan guru biologi dapat tampil sebagai guru model dan sebagai observer. Ungkapan kalimat yang dilontarkan pada saat refleksi sangat bijak yang menuntun semuanya untuk selalu memperhatikan kesulitan belajar siswa sehingga semua siswanya berhasil dengan baik. Karena itu pembelajaran yang dilakukan lebih bermakna.

Kata Kunci : Karakter terpadu, Pembelajaran, *Lesson study*, dan kecerdasan

1. PENDAHULUAN

Lesson Study (LS) adalah model pembinaan profesi guru untuk meningkatkan kualitas pembelajaran secara kolaboratif berkelanjutan dengan prinsip kolegialitas, mutual learning, dan learning community (Istamar, 2008). Dengan demikian LS dilaksanakan dan dipertanggungjawabkan secara bersama-sama oleh guru (yang serumpung) (Suherman, 2011 dan Chaidar, 2011). Karena itu, guru serumpung bersama-sama membangun komunitas belajar untuk meningkatkan keprofesionalannya. Siklus pelaksanaannya dimulai dari *plan*, yaitu guru yang serumpung bersama-sama merancang pembelajaran, memikirkan keberhasilan pelaksanaannya. Saat pelaksanaan pembelajaran (*do*), guru model sebagai pelaksana pembelajaran, guru serumpung sebagai observer ia mencermati aktifitas belajar siswa dengan menuliskannya pada lembar observer, untuk disampaikan secara bijak dan santun namun terimplisit tuntunan dan harapan pada saat refleksi (*see*). Selain itu guru dalam melaksanakan pembelajaran harus mengembangkan karakter siswa secara terpadu. Pembelajaran karakter terpadu dimaksud adalah pelaksanaan pembelajaran yang dilakukan sebagai upaya mewujudkan pengetahuan yang luas, membekali

keterampilan dan selalu dikendalikan oleh sikap yang positif. Tujuannya untuk membangun pengetahuan siswa yang komprehensif, agar nantinya menjadi siswa yang mandiri.

Bapak Pendidikan Indonesia Ki Hadjar Dewantara mengatakan bahwa: Pendidikan adalah daya upaya untuk memajukan bertumbuhnya budi pekerti (kekuatan batin, karakter), pikiran, dan tubuh anak. Bagian-bagian itu tidak boleh dipisahkan agar kita dapat memajukan kesempurnaan hidup anak-anak kita (Muslimin, 2012). Lebih lanjut diuraikan mengenai tujuan pendidikan Nasional yang tercantum dalam Undang-Undang (UU) No. 20/2003 tentang sistem pendidikan Nasional, serta Peraturan Pemerintah (PP) Nomor 19/2005 tentang Standar Nasional Pendidikan, yaitu kognitif, psikomotor dan attitude (sikap). Secara eksplisit di dalam Visi Kemendiknas bahwa pada tahun 2025 manusia Indonesia yang diidamkan adalah cerdas, komprehensif, dan kompetitif. Hal ini akan diwujudkan pada implementasi kurikulum 2013 yaitu anak Indonesia menjadi cerdas. Selanjutnya diinformasikan bahwa kepintaran seseorang dibentuk dari 1/3 kognitif dan 2/3 dari keterampilan, namun tidak cukup dengan membangun kepintaran saja tetapi harus membentuk kecerdasan. Kecerdasan dibentuk dari attitude dan karakter positif (Muslimin, 2012, Ashadi, 2012, dan Sumiyati, 2013).

Telah dilakukan penelitian mengenai sikap dan keterampilan siswa SMA Kota Palu (pada mata pelajaran kimia) tahun 2013 melalui dana penelitian hibah fundamental. Hasil penelitian yang diperoleh adalah perkembangan sikap siswa masih tergolong rendah terutama sikap religius (61,1%), kejujuran (49,2%), kemandirian (43,8%), kerja keras (45,2%), kreatifitas (56,2%), menghargai prestasi (56,2%), dan tanggung jawab (28,9%). Demikian keterampilan proses sains siswa masih sangat lemah yaitu pengamatan (59,2), komunikasi (42,3%), pengukuran (10,7%), pengklasifikasian (51,2%), menarik kesimpulan (2,4%), dan melakukan prediksi (18,2%) (Supriadi dan Suherman, 2013). Hasil tersebut ditelusuri lebih lanjut pada setiap sekolah (yang diambil datanya), diperoleh informasi yaitu proses pelaksanaan pembelajaran yang dilakukan oleh setiap guru (kimia) tidak menanamkan pendidikan kepada setiap siswa melainkan hanya melakukan pengajaran. Hasil wawancara (secara acak) kepada guru (kimia), ternyata mereka belum memahami teknik menanamkan sikap positif (karakter) kepada siswa melalui pelaksanaan pembelajaran. Demikian pula keterampilan laboratorium (kimia) mereka masih kurang. Karena itu, guru belum profesional dalam melaksanakan pembelajaran sehingga pembelajaran yang dilakukan kurang berkualitas. Akibatnya daya kompetitif siswa dan tingkat kecerdasannya rendah.

Bila dibandingkan dengan fasilitas pendukung (laboratorium, alat dan bahan) yang tersedia, maka diharapkan kepada siswa memiliki pengetahuan yang komprehensif, mandiri dan daya saing yang lebih (kompetitif). Namun kenyataannya masih banyak siswa belum mampu mandiri dan bersaing secara nasional. Faktor yang menyebabkan demikian adalah guru kurang profesional dalam menyusun, merancang dan melaksanakan pembelajaran serta kurang memahami proses pelaksanaan pembelajaran berkarakter secara terpadu. Guru tidak menanamkan pengetahuan yang komprehensif akibatnya siswa tidak mandiri, daya saingnya lemah (kurang kompetitif). Solusi dari problema tersebut, maka perlu diterapkan lesson study pada pembelajaran karakter terpadu. Dikatakan bahwa karakter adalah nilai-nilai yang terpatri dalam diri kita melalui pendidikan, pengalaman, pengorbanan, dan pengaruh lingkungan yang dipadukan dengan nilai-nilai dari dalam diri manusia yang terwujud dalam sistem daya juang yang melandasi pemikiran, sikap dan perilaku.

2. METODE PELAKSANAAN

Berdasarkan permasalahan yang dihadapi oleh kedua mitra (guru kimia SLTA dan Ka.Dinas Pendidikan dan Kebudayaan Kota Palu), maka justifikasi yang akan dilakukan oleh pengusul dan kedua mitra adalah:

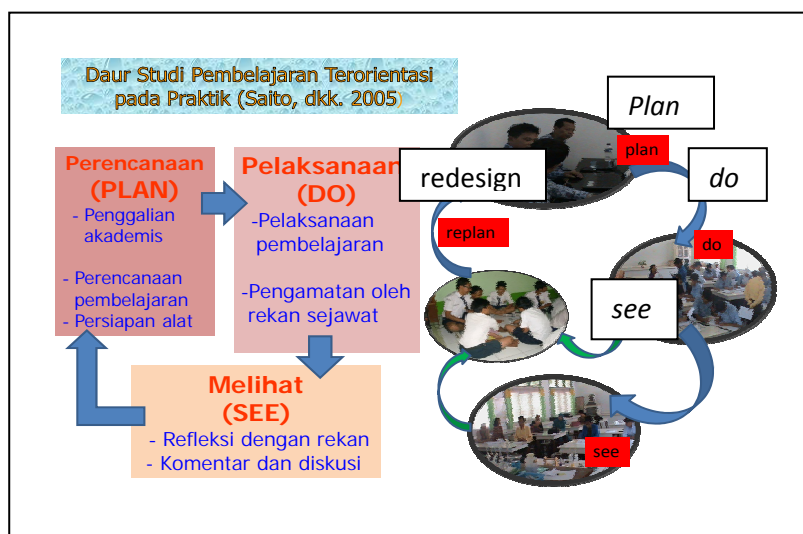
A. Pengusul

1. Memberikan pelatihan peningkatan kualitas penyusunan perangkat, rancangan, dan pelaksanaan pembelajaran berkarakter terpadu berbasis *LS* kepada guru-guru kimia dan biologi SMA Parigi Moutong dan SMA Kota Palu sehingga pembelajaran yang dilakukan lebih menanamkan pendidikan yang komprehensif, mandiri dan kompetitif.

2. Memantau pelaksanaan pembelajaran berkarakter terpadu berbasis *LS* yang dilakukan oleh guru kimia dan biologi disekolahnya masing-masing pasca pelatihan. Setiap guru kimia dan biologi yang dipantau adalah perangkat dan pelaksanaan pembelajaran yang dilakukan untuk kemudian diberikan bimbingan lebih lanjut
3. Membimbing guru kimia dan biologi SMA Parigi Moutong dan SMA Kota Palu untuk membuat tulisan ilmiah dari hasil pembelajaran berkarakter terpadu berbasis *LS* yang telah dilakukan untuk dipublikasikan baik di jurnal ilmiah maupun diprosiding seminar nasional pendidikan

B. Kedua mitra (ketua MGMP Kimiadan MGMP Biologi) Parigi Moutong dan Kota Palu

1. Pengawas Biologi/Kimia Dinas Pendidikan dan kebudayaan Parigi Motong dan Kota Palu Menginstruksikan kepada guru-guru kimia dan biologi dengan menyurat kepada setiap sekolah SMA agar guru kimia dan biologi ditugaskan untuk mengikuti pelatihan peningkatan kualitas penyusunan, rancangan, dan pelaksanaan pembel-ajaran berkarakter terpadu berbasis *LS* serta memantau pelaksanaan pembel-ajaran tersebut disekolahnya masing-masing pasca pelatihan.
2. Ketua MGMP kimia dan biologi Parigi Moutong dan Kota Palu, Memfasilitasi teman sejawat untuk mengikuti pelatihan pembelajaran kimia dan biologi berkarakter terpadu berbasis *LS* dan pengimplementasian pelaksanaan di sekolah masing-masing pasca pelatihan.
Metode/pendekatan yang digunakan pada kegiatan ini meliputi pelatihan dan bimbingan berkelanjutan (pendamping-an), dengan prosedur kerjanya sebagai berikut:
 1. Melatih guru kimia dan biologi SMA Parigi Moutong dan SMA Kota Palu tentang penyusunan perangkat, rancangan, dan pelaksanaan pembel-ajaran berkarakter terpadu berbasis *LS*
 2. Melatih guru kimia dan biologi SMA Parigi Moutong dan SMA Kota Palu untuk menimplementasikan pembel-ajaran berkarakter terpadu berbasis *LS* yang dimulai dengan:
 - a. Menyusun perangkat pembelajaran yang dilakukan secara kolaboratif antara guru kimia, guru biologi dan teman sejawat dibimbing oleh tim pengabdi.
 - b. Membuat rancangan pelaksanaan pembelajaran (*do*) oleh guru kimia dengan teman sejawat dan guru biologi dengan teman sejawat, dibimbing oleh tim pengabdi. Rancangan tersebut disesuaikan karakter model/metode pembel-ajaran yang akan digunakan, materi pembelajaran, karakter siswa, dan fasilitas yang dapat disediakan untuk menunjang keberhasilan pelaksanaan pembelajaran.
 - c. Melaksanakan pembelajaran berkarakter terpadu berbasis *LS* sesuai dengan perangkat dan rancangan pembelajaran yang telah disusun. Mula-mula guru menyampaikan kompetensi inti, indikator, dan tujuan pembelajaran. Selanjutnya melaksanakan pembel-ajaran sesuai dengan tahapan model/metode pembelajaran yang dipilih sesuai dengan karakter materi dan karakter siswa. Pelaksanaan pembelajaran diobservasi oleh tim pengabdi, Pengawas biologi/kimia, ketua MGMP dan teman sejawat. Selesai pembelajaran dilakukan refleksi untuk mengungkapkan tingkat keberhasilan pembelajaran yang dilakukan, kemudahan, dan tantangan pelaksanaan pembel-ajaran. Selanjutnya dilakukan *redesign* rancangan pembelajaran untuk pelaksanaan pembelajaran berikutnya, Gambar 1. Tahap refleksi, semua observer menyampaikan hasil pengamatannya secara bijak dan santun, yang lebih utama diperuntukkan adalah untuk aktivitas belajar siswa. Bila ada hal yang perlu disampaikan untuk guru model, maka disampaikan secara sopan dan santun.



Gambar 1. Daur/siklus pelaksanaan *lesson study*

3. Pengabdian, Pengawas biologi/kimia, Ketua MGMP dan kepala sekolah memantau pelaksanaan pembelajaran berkarakter terpadu berbasis *LS* yang dilaksanakan oleh guru kimia dan biologi di sekolah masing-masing. Pada akhir pemantauan dilakukan kembali pembimbingan berkelanjutan kepada guru kimia dan biologi SMA Parigi Moutong dan SMA Kota Palu
4. Pada akhir semester semua guru kimia dan biologi SMA Parigi Moutong dan SMA Kota Palu melakukan ujian semester, selanjutnya dianalisis hasilnya untuk dijadikan sebagai laporan
5. Guru kimia dan biologi SMA Parigi Moutong dan SMA Kota Palu membuat artikel hasil pembelajaran berkarakter terpadu berbasis *LS* untuk dapat dipublikasikan baik melalui seminar nasional maupun jurnal ilmiah (Suherman, 2012 dan 2013).

3. HASIL DAN PEMBAHASAN

Kurangnya perhatian sekolah terhadap pengembangan kebijakan dan karakter sangat berkaitan dengan munculnya revolusi industri yang berawal di Inggris pada abad ke-18, yang kemudian meluas kenegara-negara Eropa, Amerika, hingga sampai ke Jepang. Suatu perusahaan yang mengandalkan tenaga mesin untuk menghasilkan produk yang besar, ternyata apa yang diusahakan tersebut berhasil. Akibatnya kurikulum di sekolah dirubah, inti isi kurikulum menjadikan siswa sebagai manusia yang perlu mendapat penghargaan dan bertanggung jawab. Dirubah menjadi siswa hanya sebagai objek saja. Akibat yang terjadi adalah lulusan sekolah tidak lagi memperlihatkan kerjasama, kreatifitas, dan tanggung jawab.

Salah satu negara industri tersebut yang memegang teguh adat istiadat adalah Jepang. Sekitar 130-an tahun yang silang Jepang lalu mengevaluasi inti isi kurikulum dan proses pelaksanaannya, ditemukan adanya kekeliruan akibatnya produk yang dihasilkan kurang bertanggung jawab dan kurang kreatif. Berdasarkan hal tersebut, inti isi kurikulum dan proses pelaksanaannya dirubah dengan istilah “Jugyokenkyu” Inggris Lesson Study (Indonesia : Kajian pembelajaran). Lesson study dimaksudkan sebagai pembinaan profesi guru untuk meningkatkan kualitas pembelajaran secara kontinu dan berkelanjutan. Dilaksanakan secara berkolaborasi sejak perancangan, pelaksanaan, dan refleksi. Dengan demikian Lesson Study ini dilaksanakan secara bersiklus.

Implementasi pelaksanaannya dapat diwujudkan di Sekolah yaitu Lesson Study berbasis sekolah (LSBS) atau diwujudkan di Musyawarah Guru Mata Pelajaran (MGMP) yaitu *Lesson Study* berbasis MGMP (LS-MGMP). Telah diterapkan *Lesson Study* pada MGMP Kimia dan MGMP Biologi, masing-masing 3 siklus, hasil pelaksanaan pada tabel 1.

Tabel1 : Hasil pelaksanaan *lesson study* pada MGMP Kimia dan MGMP Biologi

No.	Kegiatan	Pelatihan Lesson Study dan Integrasi Karakter			Hasil
		plan	do	see	
1.	Pelatihan LS dan Karakter	8 klp kimia, latihan membuat rancangan pembelajaran	3 orang guru model kimia, dan 2 org guru model biologi	57 orang guru kimia, dan 38 orang guru biologi	Kolaborasi, kolegalitas, mutual learning, dan learning community
2	Pendampingan, LS	Di SMAN 4, SMKN 3, dan SMAN 3	Guru Model: Rohmala (SMAN 4) = 24 observer Rubianty (SMKN 3) = 21 Yuli R (SMAN 3) = 20 observer	25 orang guru 22 orang guru 21 orang guru	Kolaborasi, kolegalitas, mutual learning, dan learning community meningkat
	Pelatihan LS dan Karakter	6 klp biologi, latihan membuat rancangan pembelajaran	38 orang guru model biologi, dan 2 org guru model biologi	38 orang guru biologi	Kolaborasi, kolegalitas, dan mutual learning
	Pendampingan, LS	Di SMAN 1, SMAN 2, dan SMA N 4	Guru Model: Farida K (SMAN 1) = 24 orang observer Abdul Kadir, Drs., MPd (SMAN 2) = 20 observer Ferawati (SMAN4) = 20 observer	22 orang guru 21 orang guru 21 orang guru	Kolaborasi, kolegalitas, mutual learning, dan learning community meningkat

Pelaksanaan pembelajaran dengan menerapkan *lesson study* terbukti meningkatkan kompetensi guru (lihat hasil tabel hasil kegiatan), baik pada perancangan pembelajaran maupun pelaksanaan pembelajaran. Selain itu terjadi kepekaan pada diri guru terhadap aktifitas, kreatifitas, kedisiplinan, dan kemampuan siswa memahami materi pelajaran. Dengan demikian, penerapan *lesson study* pada pelaksanaan pembelajaran dapat membentuk karakter positif siswa. Hal ini diungkapkan bahwa, karakter merupakan nilai-nilai yang terpatri dalam diri kita melalui pendidikan, pengalaman, pengorbanan, dan pengaruh lingkungan yang dipadukan dengan nilai-nilai dari dalam diri manusia yang terwujud dalam sistem daya juang yang melandasi pemikiran, sikap dan perilaku. Pelaksanaan pembelajaran dengan menerapkan *lesson study* berarti semua guru yang terlibat dalam kegiatan ini mulai dari *plan*, *do*, dan *see* mengutarakan pengalaman baiknya sebagai suatu bentuk pendidikan. Selain itu, juga guru mengorbankan waktu dan materi untuk mengikuti kegiatan *lesson study*. Kesemuanya ini sebagai suatu komitmen yang

dimiliki oleh pribadi setiap guru untuk mewujudkan kualitas pembelajaran sebagai bentuk peningkatan profesionalismenya.

Pelaksanaan pembelajaran yang dilaksanakan oleh setiap guru dengan menerapkan *lesson study* secara kontinu dan berkelanjutan, maka profesionalisme guru semakin meningkat yang berpengaruh positif terhadap hasil belajar siswa. Karena itu, kualitas pendidikan juga meningkat. Akibatnya siswa menjadi cerdas, kompetitif, dan komprehensif. Hal ini dimungkinkan karena dalam pelaksanaan *lesson study* juga terjadi penerapan pembentukan karakter positif pada diri setiap siswa. Berbeda dengan pembelajaran lainnya untuk pembentukan kompetensi siswa, *Lesson study* memperhatikan semua kompetensi siswa sehingga semua siswa terwujud peningkatan kompetensinya. Hal tersebut menjadi perhatian bagi pelaksana pendidikan, karena kompetensi membuat seseorang bisa melakukan tugasnya dengan baik, namun karakterlah yang membuatnya bertekad mencapai yang terbaik dan selalu ingin lebih baik. Orang-orang dengan kompetensi yang tinggi tanpa disertai karakter yang baik dapat menjadi sumber masalah bagi lingkungannya (Gede Raka, dkk., 2011).

Penerapan *lesson study* pada pembelajaran yang telah dilakukan oleh MGMP Kimia dan MGMP Biologi terbukti meningkatkan kompetensi profesional dan kompetensi pedagogik guru, indikatornya adalah terjadi peningkatan kolaborasi, kolegialitas, mutual learning, dan learning community. Artinya guru kimia dan guru biologi bersama-sama membangun pengalaman pembelajaran yang berharga untuk meningkatkan kualitas pembelajaran dan profesionalisme dirinya. Selain itu, juga mereka menerapkan *lesson study* di sekolahnya bersama dengan teman sejawatnya sehingga *lesson study* dapat dilaksanakan oleh semua guru di setiap sekolah (SMA Kota Palu). Dengan demikian yang terjadi bermula dari MGMP ke sekolah. *Lesson study* dilaksanakan oleh banyak orang sehingga apabila dilaksanakan di sekolah maka tentunya melibatkan teman sejawat yang serumpung maupun tidak serumpung. Juga dapat melibatkan Kepala sekolah dan Kepala Dinas Pendidikan sebagai pengamat dan pengambil kebijakan. Hal ini telah diungkapkan oleh Istamar, 2011. Bahwa untuk memudahkan melaksanakan *lesson study* disarankan memulai dari MGMP, karena di MGMP terkumpul guru yang sebidang. Guru yang telah dilatih melaksanakan *lesson study* di MGMP kemudian diaplikasikan di sekolahnya dengan mengajak teman sejawatnya, selanjutnya hasilnya dilaporkan kepada kepala sekolah. Tujuannya adalah agar pelaksanaan *lesson study* di sekolah masing-masing mendapat izin dan legalitas dari kepala sekolah. Lebih dari itu, bila kompetensi guru meningkat dan proses pelaksanaan pembelajaran lebih berkualitas, maka kepala sekolah menginstruksikan kepada semua gurunya untuk menerapkan *lesson study* pada proses pelaksanaan pembelajaran.

Salah satu indikator keberhasilan pelaksanaan *lesson study* yang pernah dilakukan adalah pelaksanaan *lesson study* di SMPN 1 Kota Palu. Dilaksanakan sejak tahun 2012 – 2014, dengan instruksi kepala sekolah pada tahun 2014, bahwa *lesson study* akan diterapkan pada pembelajaran setiap mata pelajaran. Hasil yang mereka peroleh adalah pada Ujian Nasional tahun ajaran 2014-2015, ia berhasil mendominasi peringkat 10 besar se Wilayah Propinsi Sulawesi tengah. Hal ini membuktikan bahwa apabila guru profesional dan berkualitas dalam melaksanakan proses pembelajaran, maka hasilnya akan berkualitas pula. Telah diuraikan sebelumnya bahwa apabila pembelajaran yang dirancang dengan baik (dirancang secara berkolaborasi) dan dilaksanakan dengan baik pula (diobservasi dan di refleksi), maka hasilnya akan menjadi lebih baik. *Lesson study* mengutamakan rancangan pembelajaran yang berkualitas, sehingga pelaksanaannya lebih berkualitas pula, akibatnya hasil belajar siswa akan meningkat.

Pelaksanaan *lesson study* diawali dengan perencanaan (*plan*) kemudian dilaksanakan pembelajaran di kelas (*do*) yang diobservasi oleh banyak orang. Hasil pelaksanaan pembelajaran di kelas direfeksi (*see*) secara bersama oleh guru model dan observer. Pelaksanaan *plan*, *do*, dan *see* dinyatakan dengan tahapan pelaksanaan *lesson study* yang dinyatakan sebagai 1 (satu) siklus. Langkah – langkah setiap tahapan adalah Gambar 2;



Gambar 2. Daur/siklus pelaksanaan *Lesson study*

A. Tahap Perencanaan (*Plan*)

Tahap perencanaan (*Plan*) *lesson study* adalah tahap membuat rencana proses pembelajaran yang diamati. Tahapannya sebagai berikut:

1. Menyusun Rencana Proses Pembelajaran (RPP) dan Lembar Kegiatan Siswa (LKS). Penyusunan ini terlebih dahulu memilih seorang fasilitator (sebaiknya ketua MGMP) dan guru model sebagai guru pengajar
2. Menetapkan topik yang akan dibahas, penetapan topik perlu diperhatikan adalah ketepatan waktu pelaksanaan pembelajaran menurut silabus, kesulitan-kesulitan yang dihadapi oleh guru pada saat pelaksanaan pembelajaran, kesulitan siswa memahami materi. Penetapan metode dan media yang tepat untuk materi yang akan dibelajarkan
3. Secara berkolaborasi, calon guru model dan observer bersama-sama melakukan kajian akademis terhadap materi ajar yang terpilih. Tujuannya adalah agar tidak ada peserta mengalami miskonsepsi
4. Selanjutnya lakukan kajian terhadap kurikulum yang digunakan (standar isi, standar kompetensi), mengkaji silabus, menentukan indikator dan atau tujuan pembelajaran, kemampuan siswa yang akan dibelajarkan, ketersediaan sarana dan media, dan memilih metode yang sesuai, serta kegiatan siswa belajar yang direncanakan.
5. Membuat RPP dan LKS yang berorientasi pada kegiatan belajarsiswa aktif, saling membelajarkan, dan menumbuhkan kemampuan berfikir kreatif.
6. Antara guru model dengan teman sejawat sebagai observer bersama-sama menyepakati waktu dan tempat pelaksanaan pembelajaran.

(Istamar, 2011), Gambar 3



Gb. 2 Kedua kelompok MGMP membuat rancangan pembelajaran RPP dan LKS

B. Pelaksanaan *Open Class* (do)

Pelaksanaan *open class* pada kegiatan *lesson study* (kajian pembelajaran) adalah tahapan yang penting, karena tahapan tersebut adalah uji efektifitas rancangan pembelajaran yang telah disusun secara berkolaborasi. Hal yang perlu diperhatikan pada tahapan *open class* adalah pemantapan persiapan pelaksanaan dengan melakukan pengecekan dan kegiatan pengamat pada saat pelaksanaan *open class*.

1. Pemantapan persiapan pelaksanaan *open class*

- a. Memeriksa RPP dan LKS yang akan digunakan, pastikan bahwa RPP dan LKS tersebut dapat dibagikan kepada setiap observer
- b. Mengecek kembali data siswa sesuai dengan daftar hadir/kelompok atau pengenal atau nomor punggung siswa untuk mudah dikenali oleh setiap observer
- c. Periksa kembali ruangan yang digunakan, apakah setiap siswa/kelompok siswa mudah diamati oleh observer

2. Kegiatan pengamat (*observer*) pada saat *open class*

Fungsi utama pengamat (*observer*) adalah melakukan pengamatan dengan cermat, apakah siswa/kelompok siswa aktif belajar atau tidak aktif. Karena itu, yang perlu diperhatikan oleh observer adalah:

- a. Datang dikelas tepat waktunya, jangan datang terlambat, karena tidak mengamati seluruh aktifitas siswa pada proses pelaksanaan pembelajaran
- b. Mengambil posisi yang mudah mengamati siswa/kelompok siswa. Posisinya boleh di samping kiri, samping kanan, belakang, dan bahkan boleh masuk di tengah kelas pada saat melakukan pengamatan. Pengamat tidak dibenarkan berbicara dengan sesamanya, dengan guru model maupun dengan siswa yang sedang belajar. Pengamat hanya mencatat kondisi siswa pada saat pelaksanaan pembelajaran dengan panduan pengamatan yang telah dibagikan sebelum pembelajaran dimulai
- c. Catatan pengamatan observer hendaknya dicantumkan; kapan peristiwa terjadi, pada tahap pembelajaran mana, apa yang dilakukan siswa, dan pada saat guru melakukan tahapan pembelajaran bagaimana.
- d. Pengamat tidak diperkenankan keluar masuk kelas, sebab mengganggu pelaksanaan pembelajaran dan tidak mengamati aktifitas siswa secara keseluruhan.
- e. Fokus pengamatan setiap observer adalah interaksi siswa-siswa, siswa-guru, siswa-media, siswa-sumber belajar, siswa-lingkungan, bahasa tubuh siswa (melamun, berfikir), dan apa yang diucapkan siswa

- f. Setiap pengamat dapat mengamati satu kelompok tertentu, terutama bagi pengamat pemula. Selain dapat juga mengamati kelompok lain sehingga pengamat mengetahui kondisi dan situasi kelas secara menyeluruh.
- g. Pengamat dapat memotret dan merekam pembicaraan/diskusi siswa selama tidak mengganggu konsentrasi siswa.
- h. Bila pengamat membawa HP, sebaiknya tidak diaktifkan agar pengamat tidak disibukkan dengan panggilan HP atau SMS.
- i. Hal lain yang perlu diamati observer adalah: bagaimana teknik pengelolaan kelas, bagaimana efektifitas pencapaian tujuan pembelajaran, hal-hal yang berkaitan dengan pemanfaatan media sederhana dari lingkungan sekitar, dan bagaimana upaya guru untuk membuat siswa kreatif?. Kesemuanya ditulis pada lembar observasi, Gb. 3



Gb. 3. Kondisi Guru model dan Observer pada saat open class

C. Pelaksanaan Refleksi (See)

Setelah selesai pelaksanaan open class, maka segera dilakukan refleksi karena semua observer masih kuat ingatannya terhadap hasil pengamatannya di kelas pembelajaran. Setelah guru model menutup pembelajaran, maka calon moderator refleksi segerah mengumumkan kepada semua observer untuk pindah diruangan tertentu guna merefleksikan pelaksanaan pembelajaran. Tata cara melakukan refleksi sebagai berikut:

1. Tentukan seorang moderator. Sebaiknya moderator yang ditunjuk adalah guru senior yang berpengalaman dalam pelaksanaan *lesson study* dan mengikuti semua proses jalannya *lesson study*. Selain itu, refleksi sebaiknya dipimpin oleh kepala sekolah, pengawas, atau pejabat DIKNAS. Tujuannya agar segala permasalahan yang muncul dapat dipantau. Syarat menjadi moderator:
 - a. Menguasai konsep *lesson study*
 - b. Menguasai tata cara diskusi refleksi
 - c. Mampu memimpin diskusi secara demokratis.Selain moderator juga diperlukan notulen, yaitu mampu menuliskan semua masukan/ pertanyaan dari para observer. Hal-hal yang perlu dituliskan dalam kegiatan refleksi adalah:
 - a. Data tentang guru model, hari/tgl dilakukan open kelas, Topik mata pelajaran, waktu, tempat, Jumlah peserta yang hadir, dan nama moderator

- b. Nama yang memberikan masukan/pertanyaan, mengungkapkan data pembelajaran yaitu apa yang terjadi, kapan waktunya, bagaimana analisisnya/apa penyebabnya, bagaimana dampaknya, dan apa solusinya.
 - c. Kesimpulan refleksi dan apa yang dapat dipetik dari kegiatan pembelajaran dan refleksi saat ini.
 - d. Refleksi terakhir sebaiknya diberikan kepada ahlinya atau orang yang lebih berpengalaman dalam pelaksanaan lesson study dan mengikuti sepenuhnya pelaksanaan open class.
 - e. Hasil refleksi sebaiknya ditulis/diketik rapih untuk didokumentasikan, untuk keperluan selanjutnya
2. Setelah segalanya siap moderator mulai melakukan perkenalan dengan terlebih dahulu memperkenalkan dirinya, seluruh peserta yang didahului oleh guru model. Setiap peserta memperkenalkan diri (sebaiknya berdiri) nama, asal sekolah, mengajar mata pelajaran apa.
 3. Moderator membacakan tata tertib. Mempersilahkan guru model untuk merefleksi diri dan pada ahir refleksinya, moderator meminta kepada seluruh peserta untuk tepuk tangan.
 4. Moderator mempersilahkan para peserta (observer) secara bergantian untuk menyampaikan hasil pengamatannya tentang keaktifan siswa dalam pembelajaran, apa yang terjadi dan kapan waktunya, apa penyebabnya, bagaimana pengalaman sebelumnya (bila ada) dan bagaimana solusinya.
 5. Moderator mempersilahkan observer lain untuk memberikan tanggapan/masukan dan selanjutnya memberikan waktu kepada guru model untuk melakukan klarifikasi dengan tujuan untuk lebih jelas solusi untuk melakukan perbaikan
 6. Jika semua peserta (observer) selesai memberikan tanggapan/masukan, maka moderator mempersilahkan ahlinya (yang lebih berpengalaman tentang pelaksanaan lesson study) untuk memberikan komentarnya
 7. Menjelang akhir refleksi, moderator membacakan kesimpulan sementara, terutama pengalaman berharga yang dapat dipetik pada pelaksanaan *Lesson study* kali ini.

Isi refleksi bagi guru model, observer, dan ahli

1. Refleksi Guru Model;

- a. Ungkapkan perasaan setelah open class, ungkapkan tingkat keberhasilannya, dan hal-hal yang perlu diperbaiki atau ditingkatkan, tujuan pembelajaran tercapai atau tidak?
- b. Kemukakan apakah ada kendala mempedomani RPP/LKS yang telah disusun bersama, jelaskan mengapa demikian dan bagaimana mengatasinya
- c. Mengapa guru model menyuruh siswa A bukan siswa B, mengapa bertanya kepada setiap siswa bukan kepada seluruh kelas, dan mengapa dibentuk kelompok apa dasarnya

2. Refleksi observer:

Agar ferleksi berlangsung lebih efektif dan efisien, maka rambu refleksi bagi observer

- a. Kemukakan data pengamatan secara obyektif dan rasional. Misalnya apa yang terjadi pada siswa, kapan waktunya, apa yang dilakukan, apakah ada pengalaman yang serupa sebelumnya di kelas/sekolah lain, bagaimana solusinya
- b. Pelajaran apa yang dapat dipetik dari kejadian tersebut

3. Refleksi oleh pakar

- a. Lakuak refleksi sama dengan observer, kemukakan jalannya pembelajaran di kelas
- b. Kemukakan bagaimana kegiatan para observer pada saat open class apakah sudah sesuai yang dipersyaratkan
- c. Kemukakan jalannya refleksi apakah sudah sesuai dengan ketentuan
- d. memberikan pendalaman isi (materi) dan paedagogik
- e. mengemukakan hal-hal lain yang berkaitan dengan falsafah pembelajaran, kurikulum, dan tujuan pendidikan. Gambar 4



Gb. 4 Situasi refleksi di jepang dan di SMAN Parigi Tengah

Penerapan *Lesson study* pada pelaksanaan pembelajaran di MGMP Kimia dan MGMP Biologi adalah mengintegrasikan karakter positif. *Lesson study* dapat membentuk karakter positif siswa, karena pada proses pelaksanaannya mengutamakan adanya kerjasama antar siswa, tanggung jawab, keaktifan dan kreatifitas siswa, inovasi dan relegius. Lampiran 2

4. KESIMPULAN

1. Karakter bebas lesson study, penerapannya dalam pembelajaran dapat meningkatkan:
 - a. Kompetensi (professional, paedagogik, Kepribadian, dan social)
 - b. Kualitas pembelajaran yang dilaksanakan oleh guru
 - c. Kualitas hasil belajar siswa
2. Karakter berbasis LS, meningkatkan: Kecerdasan siswa

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PENINGKATAN PROFESIONALISME GURU MELALUI KEGIATAN *LESSON STUDY* BERBASIS SEKOLAH DI SMP NEGERI 2 BEJI PASURUAN

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Abstrak: Hasil supervisi pembelajaran menunjukkan bahwa profesionalisme guru SMPN 2 Beji perlu ditingkatkan. Maka terpilih *Lesson Study* Berbasis Sekolah sebagai langkah untuk meningkatkan. Hal ini berhubungan dengan *Lesson Study* Berbasis Sekolah yang telah dilaksanakan diberbagai sekolah di kabupaten Pasuruan. Tujuan penulisan makalah ini untuk memberikan gambaran deskriptif tentang profesionalisme guru di SMPN 2 Beji setelah mengimplementasikan LSBS. Makalah ini menggunakan pendekatan deskriptif. Instrumen yang digunakan adalah: 1) lembar observasi pembelajaran, 2) RPP, dan 3) lembar kuesioner/angket. Data kemudian di deskripsikan dan dianalisis secara statistik deskriptif. Berdasarkan hasil observasi diketahui bahwa guru SMPN 2 beji telah mampu mengembangkan tingkat profesionalisme setelah ada LSBS. Ini terlihat dari persentase guru yang setuju jika kegiatan LSBS terus dikembangkan di sekolah yaitu sebesar 98% atau 32 guru dengan alasan mampu meningkatkan kemampuan dalam mengajar. Sedangkan 27% atau sekitar 9 guru menyatakan bahwa LSBS banyak menyita waktu luang dengan alasan untuk menyusun plan dan menyiapkan peangkat pembelajaran tidak mudah dan membutuhkan waktu lama sehingga membutuhkan waktu luang. Telah banyak perubahan-perubahan yang dilakukan oleh guru selama dilaksanakan kegiatan LSBS di SMPN 2 Beji untuk memperbaiki profesionalisme dan mampu mengubah cara membelajarkan peserta didik menjadi aktif dan lebih baik lagi. Dengan LSBS diharapkan guru menjadi lebih terbuka dan dapat menerima pembaharuan yang dibawa dalam kegiatan *Lesson Study*.

Kata Kunci: LSBS, profesionalisme guru

1. PENDAHULUAN

Salah satu aspek yang dapat dijadikan tolak ukur kemajuan suatu Negara yaitu kemajuan dibidang pendidikan. Pendidikan mempunyai peranan strategis dan membrikan kontribusi yang sangat besar dalam mengembangkan dan meningkatkan kualitas Sumber Daya Manusia (SDM). Pendidikan merupakan ujung tombak dalam mencapai pemabangunan yang adil, makmur dan sejahtera. Oleh karena itu pemerintah terus berupaya dan melakukan terobosan baru dibidang pendidikan, agar kerterbelakangan bangsa Indonesia khususnya di bidang pendidikan tidak semakin terpuruk.

Pada abad 21 ini telah terjadi perkembangan teknologi dan informasi yang sangat cepat. Perubahan dan perkembangan yang telah terjadi terkadang lebih cepat dari yang kita perkirakan. Hasil penemuan atau sesuatu yang baru dalam hitungan detik akan menjadi hal yang biasa dan sudah banyak dilakukan orang lain. Maka, hanya manusia-manusia yang memiliki kualitas sumber daya manusia unggul yang akan mampu menyesuaikan diri dengan perkembangan perubahan tersebut.

Berdasarkan kenyataan di atas, untuk menghadapi abad 21 yang merupakan abad teknologi, informasi, dan persaingan maka diperlukan mansuia-manusia yang memiliki kemampuan berpikir kritis yaitu mampu dan tanggap dalam menyikapi segala perkembangan dan perubahan secara cerdas dan tepat.

Sebagai solusi yang sinergis dari masalah-masalah tantangan abad 21, mutu pendidikan dan kualitas sumber daya manusia, sebagai bagian dari insane pendidik harus berbuat dalam kapasitas kita sebagai pendidik utnuk dapat turut berperan dalam memberdayakan pembelajaran yang sesuai dengan tujuan, hakikat, dan solusi permasalahan bangsa.

Seiring dengan perkembangan IPTEK, pengetahuan guru harus selalu disegarkan. Kegiatan seminar atau forum diskusi ilmiah merupakan media untuk penyegaran guru baik materi subyek maupun pedagogi. Sayangnya, tidak sedikit kepala sekolah yang tidak mengijinkan guru untuk berpartisipasi

dalam kegiatan MGMP misalnya. Dimana seharusnya kepala sekolah mendorong bahkan memfasilitasi guru agar bisa berpartisipasi dalam kegiatan ilmiah.

Lesson Study diartikan suatu model pembinaan profesi pendidik melalui pengkajian pembelajaran secara kolaboratif dan berkelanjutan berdasarkan prinsip-prinsip kolegialitas dan *mutual learning* untuk membangun komunitas belajar (Joharmawan, 2005). *Lesson Study* bukan metode atau strategi pembelajaran tetapi kegiatan *Lesson Study* dapat menerapkan metode/strategi pembelajaran yang sesuai dengan situasi, kondisi, dan permasalahan yang dihadapi guru.

Lesson Study dilaksanakan dalam tiga tahapan yaitu *Plan* (merencanakan), *Do* (melaksanakan), dan *See* (merefleksi). Dengan kata lain *Lesson Study* merupakan suatu cara peningkatan mutu pendidikan yang tak pernah berakhir (*continuous improvement*) (Hendayana, 2007).

Peningkatan mutu pendidikan melalui *Lesson Study* dimulai dari tahap perencanaan (plan) yang bertujuan untuk merancang pembelajaran yang dapat membelajarkan peserta didik dan berpusat pada peserta didik, bagaimana supaya peserta didik berpartisipasi aktif dalam proses pembelajaran. Perencanaan yang baik tidak dilakukan sendirian tetapi dilakukan bersama, beberapa guru dapat berkolaborasi atau guru-guru dan dosen dapat pula berkolaborasi untuk memperkaya ide-ide (Hendayana, 2007).

2. LESSON STUDY BERBASIS SEKOLAH (LSBS)

Lesson Study Berbasis Sekolah telah dilaksanakan di SMP Negeri 2 Beji. Dalam program ini guru-guru SMP Negeri 2 Beji telah mendapatkan pengarahan, panduan, pelatihan dan juga pendampingan dari guru-guru yang telah mengikuti kegiatan *Lesson Study* sebelumnya.

Pelatihan untuk Peningkatan kualitas pembelajaran melalui *Lesson Study* Berbasis Sekolah bagi guru-guru sebagai upaya peningkatan pengetahuan, wawasan dan keterampilan dalam mempersiapkan pembelajaran, pengembangan silabus, pengembangan LKS, pengembangan kegiatan laboratorium dan melatih keterampilan pembelajaran di kelas. Kegiatan workshop *Lesson Study* Berbasis Sekolah mulai dari penyusunan perangkat pembelajaran, pelaksanaan di kelas dan saat refleksi (*Plan-Do-See*). Kegiatan pendampingan guru secara berkesinambungan di sekolah dirasa sangat membantu guru dalam meningkatkan rasa percaya diri, membantu penyelesaian masalah yang dihadapi guru, serta member dorongan untuk senantiasa meningkatkan pengetahuan dan keterampilan dalam pembelajaran. Untuk meningkatkan kualitas guru ditempuh dengan *lesson study*, cara tersebut dipilih karena guru dalam satu kelompok dapat saling belajar tentang metode pembelajaran dalam tahap perencanaan pembelajaran, tahap pelaksanaan di kelas dan juga diskusi tentang metode tersebut setelah melihat dan mengamati bersama saat salah seorang guru mempraktikkan rancangan pembelajaran yang telah dirancang bersama dalam kelas sesungguhnya dan juga dapat memahami bagaimana peserta didik belajar (Setriarini, 2009).

Kualitas pendidikan sangat ditentukan oleh kemampuan sekolah dalam mengelola proses pembelajaran, dan lebih khusus lagi adalah proses pembelajaran yang terjadi di kelas, dalam hal ini guru perlu diberi keleluasaan dan diharapkan mampu menyiapkan seluruh perangkat pembelajaran dengan baik, sesuai dengan kondisi objektif peserta didik dan sarana prasarana yang tersedia (Chotimah, 2005).

Kegiatan *Lesson Study* Berbasis Sekolah merupakan saran yang tepat untuk meningkatkan profesionalisme guru dalam pembelajaran sehingga meningkatkan mutu sekolah. SMP Negeri 2 Beji merupakan salah satu sekolah di Kabupaten pasuruan yang menerapkan *Lesson Study* Berbasis Sekolah (LSBS). Dalam menjalankan program tersebut tim LSBS terus mengupayakan adanya perubahan mutu pembelajaran di sekolah melalui kegiatan *Lesson Study* . pelaksanaan *Lesson Study* Berbasis Sekolah meskipun kurang continue kegiatannya tetapi telah tampak memberikan kontribusi yang baik bagi peningkatan profesionalisme guru-guru SMP Negeri 2 Beji.

Ada korelasi yang signifikan antara pelaksanaan LSBS dengan mutu pembelajaran yang dapat dirasakan oleh peserta didik maupun guru pengajar. Dengan LSBS guru terus belajar untuka meningkatkan mutu pembelajaran dan peserta didik semakin mandiri dalam belajar. LSBS yang diterapkan dengan “ruh” filosofi konstruktivisme membuat guru semakin percaya diri dan selalu berupaya

mengembangkan inovasi-inovasi pembelajaran agar terwujud suasana pembelajaran yang mengarah ke *student center*.

Selama satu semester ditahun pelajaran 2015-2016 dilaksanakan LSBS di SMP Negeri 2 Beji, telah banyak guru dan peserta didik yang merasakan perubahan pembelajaran karena kegiatan LSBS. 36% dari jumlah keseluruhan guru, telah bersedia membuka kelas untuk diamati oleh guru-guru yang lain. Dan 57% dari seluruh peserta didik di SMP Negeri 2 Beji telah mengikuti kegiatan LSBS ini selengkapny dapat dilihat pada Tabel 1.

Tabel 1. Guru dan Peserta didik yang telah mengikuti LSBS

No	Jumlah Guru	Guru model	Jumlah peserta didik	Rombel
1	33	36%	57%	21

Dalam upaya memperoleh data yang akurat serta refleksi terhadap kegiatan *Lesson Study* Berbasis Sekolah yang dijadikan salah satu program unggulan (ikon) Dinas Pendidikan kabupaten Pasuruan, penulis menyebarkan angket kepada guru yang terlibat kegiatan *Lesson Study* Berbasis Sekolah yang ada di SMP Negeri 2 Beji sebanyak 33 angket. Hasil rekapitulasi angket dapat dilihat pada Tabel 2.

Tabel 2. Hasil Rekap Angket

No	Pernyataan	Ya	Tidak
1	Apakah saudara setuju kegiatan <i>Lesson Study</i> Berbasis Sekolah terus dikembangkan di SMP Negeri 2 Beji? Alasan:	32	1
2	Apakah kegiatan <i>Lesson Study</i> Berbasis Sekolah memotivasi saudara untuk melakukan perubahan dalam proses pembelajaran? Contohnya:	30	3
3	Apakah kegiatan <i>Lesson Study</i> Berbasis Sekolah telah mampu mengubah cara saudara dalam membelajarkan peserta didik? Contohnya:	30	3
4	Apakah kegiatan <i>Lesson Study</i> Berbasis Sekolah banyak menyita waktu luang saudara? Alasannya:	9	24
5	Apakah kegiatan <i>Lesson Study</i> Berbasis Sekolah membutuhkan banyak waktu untuk persiapannya? Alasannya:	9	24
6	Apakah kegiatan <i>Lesson Study</i> Berbasis Sekolah dapat meningkatkan profesionalisme guru? Contohnya:	30	3
7	Apakah kegiatan <i>Lesson Study</i> Berbasis Sekolah mampu menjalin komunikasi yang baik antar teman guru serumpun bidang studi?	33	-
8	Apakah kegiatan <i>Lesson Study</i> Berbasis Sekolah mampu menjalin komunikasi yang baik antar teman guru antar rumpun bidang studi?	33	-
9	Apakah saudara merasa memperoleh pengalaman berharga saat menjadi pengamat kegiatan <i>Lesson Study</i> Berbasis Sekolah? Contohnya:	33	-
10	Apakah saudara merasa memperoleh pengalaman berharga saat menjadi guru model pada kegiatan <i>Lesson Study</i> Berbasis Sekolah? Contohnya:	12	-

(Sumber: adaptasi Tim Pengembang Akademik dan Evaluasi SMA Lab UM-Malang)

Dari hasil rekapitulasi angket yang telah disebarakan dapat di jelaskan sebagai berikut: 97% guru setuju kegiatan *Lesson Study* Berbasis Sekolah terus dikembangkan di SMP Negeri 2 Beji dengan alasan dapat meningkatkan kemampuan dalam mengajar dan dapat menambah wawasan. 91% guru setuju bahwa *Lesson Study* Berbasis Sekolah dapat memotivasi guru untuk melakukan perubahan dalam proses pembelajaran dengan contoh dapat menyusun Rencana Pelaksanaan Pembelajaran dengan lebih baik, dapat menrapkan metode-metode pembelajaran yang inovatif. 91% guru setuju bahwa kegiatan *Lesson Study* Berbasis Sekolah mampu mengubah cara guru membelajarkan peserta didik dengan contoh pembelajaran telah mengarah ke "*student center*". 27% guru menyatakan kegiatan *Lesson Study* Berbasis Sekolah

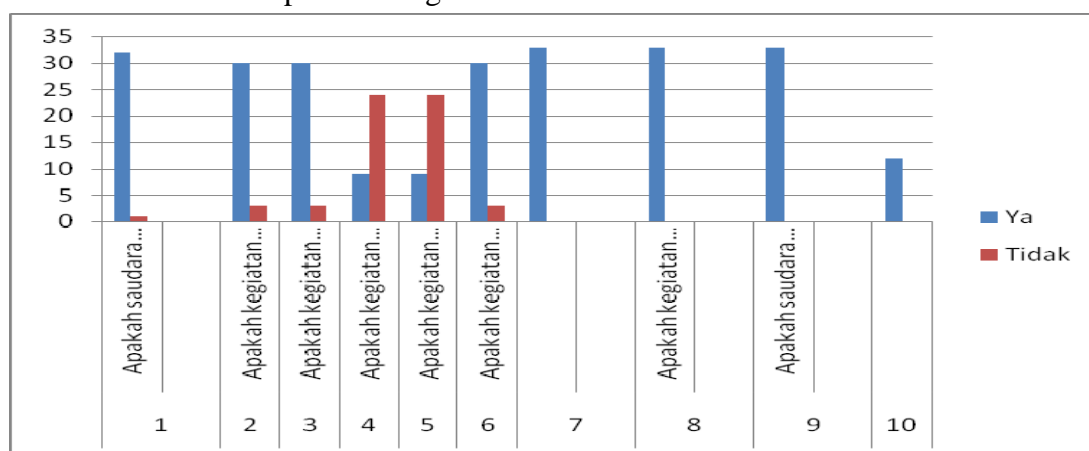
menyita waktu karena jam pulang kantor menjadi molor karena adanya kegiatan LSBS ini, dan 73% menyatakan kegiatan *Lesson Study* Berbasis Sekolah tidak menyita waktu luang dengan alasan dilaksanakan pada jam dinas dan tidak menyita waktu mengajar.

Guru menyatakan (27%) bahwa kegiatan *Lesson Study* Berbasis Sekolah membutuhkan banyak waktu untuk persiapan dengan alasan untuk menyusun *plan* dan menyiapkan perangkat pembelajaran yang lain tidak mudah. Sedangkan 73% guru menyatakan kegiatan *Lesson Study* Berbasis Sekolah tidak membutuhkan banyak waktu untuk persiapan dengan alasan semua persiapan sebenarnya sudah ada, karena guru selalu membuat perangkat untuk melakukan proses pembelajaran di kelas, dan bekerjasama dengan teman guru serumpun atau antar rumpun membuat persiapan menjadi lebih matang dan mudah dari pada disiapkan secara mandiri.

Sebanyak 91% atau 30 guru dari jumlah keseluruhan guru di SMP Negeri 2 Beji menyatakan *Lesson Study* Berbasis Sekolah dapat meningkatkan profesionalisme guru, menjalin komunikasi yang baik antar teman guru serumpun maupun teman guru antar rumpun dalam kegiatan observasi maka dapat terjalin kerjasama yang abai dalam meningkatkan komunikasi dan profesionalisme guru khususnya dalam mengambangkan empat kompetensinya.

Guru yang menjadi obyek penulisan ini juga menyatakan bahwa dari kegiatan *Lesson Study* Berbasis Sekolah ini mereka mendapatkan pengalaman berharga saat mereka menjadi pengamat maupun saat menjadi guru model. Dengan alasan dapat melihat kekurangan diri sendiri sehingga upaya untuk memperbaiki diri dalam proses pembelajaran dan mengetahui metode-metode pembelajaran dari guru model yang tampil. Untuk lebih jelasnya perhatikan Gambar 1 hasil rekap angket.

Gambar 1. Hasil Rekapitulasi Angket



Gbr. 1. Hasil rekapitulasi Angket

Berdasarkan Gambar 1 dapat dilihat dengan jelas perbedaan hasil angket yang telah disebarakan kepada semua guru di SMP Negeri 2 Beji, bahwa guru setuju kegiatan *Lesson Study* Berbasis Sekolah tetap dilaksanakan dan dikembangkan karena dapat meningkatkan profesionalisme mereka (guru).

Dilihat berdasarkan hasil observasi terhadap Rencana Pelaksanaan Pembelajaran yang telah dibuat oleh guru-guru SMP Negeri 2 Beji diketahui bahwa guru-guru SMP Negeri 2 Beji telah mampu melakukan perencanaan pembelajaran dengan baik. Hal ini dapat dilihat dari beberapa aspek, diantaranya : perencanaan alokasi waktu telah sesuai dengan saat implementasi di kelas saat berlangsung *do*, waktunya tepat dan sesuai dengan waktu yang dibutuhkan, penggunaan media/sumber belajar sangat efektif dan efisien, penerapan metode/model pembelajaran inovatif sesuai dengan materi yang

disampaikan sehingga dapat membangkitkan motivasi peserta didik saat proses pembelajaran berlangsung.

3. KESIMPULAN DAN SARAN

Dari pembahasan mengenai profesionalisme guru melalui kegiatan *Lesson Study* Berbasis Sekolah dapat disimpulkan sebagai berikut: kegiatan *Lesson Study* Berbasis Sekolah dapat meningkatkan kinerja guru terutama dalam perbaikan scenario pembelajaran dan penerapan metode-metode pembelajaran yang sesuai dengan materi yang disampaikan. Kegiatan *Lesson Study* Berbasis Sekolah mampu meningkatkan komunikasi antar guru baik serumpun maupun antar rumpun sehingga situasi di sekolah menjadi lebih baik. Kegiatan *Lesson Study* Berbasis Sekolah mampu meningkatkan semua kompetensi yang harus dimiliki oleh guru agar guru bisa menjadi lebih profesional lagi mengembangkan dirinya. Kegiatan *Lesson Study* Berbasis Sekolah yang telah dapat meningkatkan kemampuan guru akan juga meningkatkan keberhasilan peserta didiknya. Telah banyak perubahan-perubahan yang dilakukan oleh guru selama dilaksanakan kegiatan LSBS di SMPN 2 Beji untuk memperbaiki profesionalisme dan mampu mengubah cara membelajarkan peserta didik menjadi aktif dan lebih baik lagi. Dengan LSBS diharapkan guru menjadi lebih terbuka dan dapat menerima pembaharuan yang dibawa dalam kegiatan *Lesson Study*.

Kegiatan *Lesson Study* Berbasis Sekolah di SMP Negeri 2 Beji akan senantiasa dilaksanakan dan dikembangkan, dimantapkan bahwa tidak akan ada kata jemu dan bosan karena dengan melakukan *Lesson Study* Berbasis Sekolah kita akan selalu mendapatkan ilmu baru. *Lesson Study* Berbasis Sekolah seharusnya tetap menjadi pilihan utama bagi setiap lembaga pendidikan dalam mengembangkan kemampuan guru dalam mengelola pembelajarannya. Lembaga pendidikan yang belum menerapkan *Lesson Study* Berbasis Sekolah diharapkan mau dan bersedia membuka diri untuk berubah menjadi lebih baik dan lebih baik lagi. Tidak ada sesuatu yang sulit untuk dilakukan jika terus berusaha pasti keberhasilan akan menyertai.

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**MENTORING MANAGEMENT OF LESSON STUDY
TO IMPROVE THE QUALITY OF LEARNING
FOR THE ELEMENTARY SCHOOL IN CURRICULUM 2013**

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Abstract

: The preparation of this article aims to describe management mentoring lesson study in the 2013 curriculum based local superiority of Undo Ulo local game at SDN I Panjang as an effort to improve learning quality starting from the preparation of learning device, learning process and evaluation. The mentoring method uses participant active learning approach, with lecture method, question and answer, discussion, discovery, brainstorming and open class. The plan is done by field study, the identification of need and, literature study, compile the material, schedules and coordinative and collaborative mentoring budget. At the step of the implementation of lesson study mentoring consists of plan step consisting of socialization and workshop, determine the material and the learning model, compile the learning device, students sheet activity and undo ulo game media collaboratively. At the step of do, the open class implementation, the implementation of thematic learning process observed collaboratively by school supervisor, principal, colleagues and 5 parents of students. Observation includes the teacher activity, the student activity and learning result. The step of see is obtained an input that the learning media needs to be prepared by paying attention to the characteristics of the students and the classroom, parents are more often involved in learning with the open class. On the evaluation is obtained input that the mentoring program and lesson study needs to be done continuously by all teachers in order to improve learning. The conclusion is lesson study mentoring consisting of plan, do, see by implementing functions of planning management, implementation and evaluation run actively, creative and fun, teachers understand the essence of lesson study, teachers can implement the lesson study in innovative learning and utilizing the superiority of Kudus local culture as a material and learning media.

Keywords

: Management, Lesson Study, Ondo Ulo, Learning, Elementary School

1. INTRODUCTION

The development of science and technology in the globalization era demands increasing professionalism of intellectual to be able to survive in a competition world. The intellectual quality can only be realized through education. Education as an effort to educate the nation's life is a goal that will be realized with an increase in the quality of all elements, including the enhancement of the teachers professionalism.

Professional and qualified teachers have always been demanded in different level and type of educational institution, either the institution teacher training College or institutions of School (Hendry, 2010). It encourages teachers to improve the professionalism, quality of performance and competencies. The task of the teacher is to educate, guide and train will be achieved optimally if it has a number of competencies, including academic, pedagogic competence, personality and social (Act No. 14 of 2005).

Increase in teacher quality continuously strived, but in reality many of the problems related to the world of education, including the quality of the process and outcomes of education which has not been in accordance with expectations (Murtono, 2013), teachers tend to use conventional means in teaching, lack of knowledge about innovations in learning, less interested to add insight, and lack adequate facilities and infrastructure (Syahrul, 2009). In addition, it is needed for assessing the quality of teaching and student learning output continuously and comprehensively (Widiyoko, 2011).

Low student learning outcomes caused by the lack of quality of the teacher is classic reason that is often echoed in education. Teachers as a scapegoat as sources of error. Improving teacher quality should be a fundamental and comprehensive. Improving the quality of the most effective learning can be done with lesson study (Herman, 2012). Anggara & Umi (2012) states that one of the training that is used to improve the performance of teachers including lesson study of MGMP is based teaching profession coaching program. Additionally, Suwarno (2009) also found Teacher Activity Center (PKG) SD is one tool that is effective in improving the professionalism of teachers in elementary school.

Lesson study is one form of teacher training (in-service) that can be done to improve the professionalism of teachers. Lesson study is a collaborative activity between teachers in preparing lesson plans and its devices and source, the implementation of classroom teaching is accompanied observation and reflection. By lesson study the teachers can assess and exchange ideas to improve their performance that is expected to improve the quality of learning and produce the high-quality students. national education standards messages that the process of learning in the educational unit organized in interactive, inspiring, fun, challenging, motivating students to actively participate and provide enough space for innovation, creativity, and independence according talents, interests, and physical and psychological development of students. It indicates that teachers are required to be able to have an approach, strategies and methods that can create the conditions class on active learning, innovative, creative, effective and fun so that students competencies achieve with the maximum. Lesson study designed properly will make professional and innovative teachers and lesson study to have an effective way to improve the quality of learning (Amri & Ahmadi, 2010).

Lesson study Mentoring will be done to improve the quality of primary school teachers is to produce lesson plan (RPP) device and simulation of learning implementation of curriculum in 2013 based on the superiority of local culture. Curriculum 2013 is renewal curriculum of the education unit level curriculum. Feature of curriculum 2013 for the primary school is thematic integrative. In this approach the charge of sains and social education as a matter of discussion in the lesson, namely on the two subjects will be integrated into all subjects. Sains material will become a matter of discussion of Indonesian Language and Mathematics, while for the social material will be a discussion of the subject matter and the Indonesian Pancasila and Citizenship Education (Endah & Loeloe: 2013). Application of lesson study mentoring school of curriculum in 2013 is expected to be implemented properly so that teachers can understand and implement the curriculum in 2013.

Based on the explanation above, it is necessary lesson study mentoring activities in SD 1 Panjang that objectives: 1). To mentor teachers SD 1 Panjang Kudus in order to acquire knowledge about lesson study activities for learning in primary schools. 2). To mentor teachers SD 1 Panjang to make and use the learning tools and media to the curriculum 2013 based on local advantages of learning Kudus in primary schools. 3). To mentor teachers SD 1 Panjang Kudus to open thematic learning class in the curriculum 2013 based on local advantages of Kudus using the media "Ondo Ulo".

2. MENTORING METHODS

The method used in this devotion participant using active learning approach that actively participate in lesson study mentoring activities in curriculum 2013 based on local advantages of Kudus. This training is formed interactive training and mentoring. Two-way interaction occurs between teams with devotion participants. During the process of devotion, elementary school teachers of SD 1 Panjang as the participants are free to give ideas, concepts, opinions and experiences in order to obtain knowledge that will be useful in the process of learning. Metode used in the process of training and guidance are as follows. 1). lecture method; 2). question and answer; 3). discussion; 4). invention; 5). brainstorming; 6). open class. Mentoring process from planning, implementation and evaluation analyzed descriptively and qualitatively.

3. RESULT AND DISCUSSION

Mentoring lesson study begins with an analysis of the need to observe and analyze the course of learning in SDN I Panjang, as a first step to determine the obstacles, problems experienced by teachers and students and to determine the characteristics of the focus problems. SDN I Panjang is one of the designated schools to implement the curriculum of 2013. Basically, the course of the learning process has been going well, it can be seen from student achievement with a value above the KKM. However, based on interviews with one of the teachers, there is the problem that is less maximal learning process in the implementation of the curriculum 2013. In order to run with the maximum learning process, required input and advice from fellow teachers and experts to evaluate the learning that has been done. One of the activities that can be done is an interactive training and lesson study mentoring in the curriculum 2013 based on local advantages to increasing the quality of learning. Training and mentoring are presented is the implementation of learning curriculum 2013 of local excellence Kudus agency for learning more meaningful.

Mentoring of lesson study learning activities in curriculum 2013 implements management functions starting from planning, implementation and evaluation, with hope of systematic training can run optimally and achieve goals. Management approach can facilitate and support the achievement of organizational goals. It is appropriate to Stoner opinion (1992: 8) that management is the process of planning, organizing, directing, monitoring to achieve organizational goals. Management of lesson study mentoring is expected to have the ability better pedagogic to improve the professionalism and quality of learning. This is because the lesson study is a professional model guidance for educators through collaborative learning assessment and sustainable based on the principle of collegiality and quality in order to build a learning community (Amri & Ahmadi, 2010). Steps of lesson study by Saito (2009) consists of the planning phase (phase plan), open learning (do phase) and reflection (see phase) can improve the quality of learning that teachers implemented, so that more meaningful learning and achievement of student learning outcomes are maximized. In detail the steps management assistance in learning the lesson study can be seen in the picture below.

discussions, brainstorming and invention. First, the researchers asked the opinion of teachers about the learning that has been done related to problems or barriers experienced, asking the parents associated with the intended learning, and ask for supervisor feedback about the learning school would do. So in this activity, matter is not only of researchers, but also there is a contribution from all subjects. Parents of students presented them to know that during this learning takes place and the researchers want to know the pattern of student learning is done at home as well as to determine the type of learning that had been expected by parents. So, lesson study activities involving the entire community to gather the best learning.

After knowing the condition of learning during this progress, researchers together with school faculty, parents and the supervisor discuss and draw up a learning tool. The discussion is held after the activities of delivery the material, which is used to discuss the scheme of lesson study, the application of innovative learning of Kudus local excellence, innovative learning media as well as preparation for the implementation of open class (stage do) activities. At this stage of the research subjects are divided into several groups to create a learning device, starting from determining the learning model, determine the material, create lesson plans, create teaching materials and student activity sheets (LAS) and contains instructional media. Learning device compiles based Kudus local excellence, the introduction of culture in the learning process, instructional materials and media. Once you finish creating, each group presents the results of its work and discussions to obtain feedback. They are enthusiastic to do this activity because in developing learning tools that have been done still individuals. After it is agreed that the media used is Ondo ulo. School cicitas, parents and supervisors collaborate in making Ondo ulo media card along with the problem. After that, they point to the teacher practices and discuss the things that will be done in the open class.

Do step, the implementation of the open class begins with a briefing hosted by the researchers, provide observation sheet for observing and assessing the activity of learning activities on the principal, five parents of school supervisors and three colleagues. This observation sheet unbiased assessment indicators of teacher preparation before teaching, presentation / performance of teachers when teaching, innovative teaching methods used by teachers, student activity in learning and discovery activities in learning by students. After that, the model teacher implements learning device that has been created together in class V. This study uses a model Roaming Neighborhood Nature (JAS) equipped with teaching materials on the theme of ecosystems, LAS and Ondo ulo media. Ondo ulo Media is a medium which is adapted from the game of snakes and ladders but contains images of the Kudus local culture, equipped with card problems.

This activity started by giving apperception, forming student groups, to share teaching materials and LAS. Students are asked to read the teaching material then fill LAS. LAS is equipped with cruise activities around the nature of the ecosystem material. So learning is not only done in the classroom, but also outside the classroom. Thus, students are free to explore. After that, the students return to the classroom to discuss the results of his work. After filling LAS, learning continued with Ondo ulo games. Students look happy and enthusiastic. They seem to enjoy the learning process even though there are many observers around him. The event ends with the provision of post-test to determine the extent of achievement of competencies achieved by students. Orientation in curriculum 2013 is to achieve a balance between the attitude of the competencies, skills and knowledge in addition to a holistic and fun way of learning (Endah & Loeloek, 2013).

At this see step is obtained input that learning media needs to be prepared with due regard to the characteristics of students and classes. Observation results that the learning is interactive and fun, students are active and are not bothered by the presence of the observer. Parents feel happy to see the students' learning, and hope that more often involved in learning such as open class.

The last steps evaluation of lesson study activities. Devotion team conducts evaluations, assess, advise, feedback and rewards related to the results of the training, product training, simulation and thematic teaching practice learning curriculum 2013 based on local advantages performed and created by participants of devotion. The evaluation is conducted two phases of evaluation conducted by the observer

and evaluation by a team of devotion. Evaluation by the observer that the evaluation conducted by supervisors, principals, colleagues and parents to provide input in the form of media nor learning tools used in learning activities should be tailored to the characteristics of the students. While the evaluation by the mentoring team that obtained the input that mentoring programs lesson study needs to be done.

The all activities evaluation results that assistance activities on thematic learning lesson study integrative curriculum 2013 based on local advantages of Kudus are running smoothly, active, creative, and fun. Elementary school teachers 1 Panjang Kudus able to: 1) understand the essence of lesson study activities, 2) apply the lesson study activities in learning, 3) collaborate between teachers in creating innovative learning to improve the quality of learning, and 4) utilize local advantages of Kudus materials and media in the learning process constantly by all the teachers in order to improve the learning.

4. CONCLUSIONS AND SUGGESTIONS

Lesson study mentoring activities on local excellence based curriculum in 2013 to improve the quality of learning in SD 1 Panjang Kudus by applying management functions; Planning includes field studies, identification of needs or problems, organizing material assistance, schedule and budget. At the implementation step comprises "plan" with socialization and lesson studyworkshop, prepare lesson plans, materials and learning models, preparing instructional Ondo Ulo media. In the "do" implementation step is done with open class followed the principal supervisors, peers, parents and devotion team. On step of "see" obtains input that teachers needs instructional media to consider the characteristics of the students. In addition, parents also need to be scheduled to be involved in learning. The results of the evaluation of the mentoring activities also provide the following benefits; 1). 1 SD 1 Panjang Kudus teacher can get to know and understand the essence of lesson study in learning activities; 2). SD 1 Panjang Kudus teacher can implement lesson study in learning activities in elementary schools by implementing innovative teaching model and media based local excellence.

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Design of Collaborative Learning in Sharing Task and Jumping Task on The Topic of Electrolyte and Non-Electrolyte Solution

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Abstract: The aim of this study was improving the quality of chemistry learning in high school by developing lesson design of collaborative learning in sharing task and jumping task. The chemistry concept of this design was electrolyte and non-electrolyte solution. These two different tasks, sharing task and jumping task, give students the opportunity to enhance motivation, discover knowledge, communicate with peers, share their ideas, and learn together. The method in this study was qualitative research method. Test items, interview guideline, and observation sheets were used as instruments to collect data. This lesson design based on student's learning obstacle and teacher's self-reflection. The lesson design was implemented twice. The first implementation showed the lack group discussion during sharing task activity, but it went very well in jumping task activity. The design revision was applied in the second implementation. It revealed great progress in group discussion, activeness, and curiosities of students during the learning process. From both implementations revealed some of the low academic students successfully "jumping" with scaffolding from peers and teacher. However, some of the learning obstacles that have been identified before were still found, they just reduced. Based on the result of both implementations, we obtained a lesson design of collaborative learning in sharing task and jumping task on the topic of electrolyte and non-electrolyte solution.

Keywords: Lesson Design, Collaborative Learning, Sharing Task, Jumping Task, Electrolyte and Non-Electrolyte

1. INTRODUCTION

Improving the quality of education always be a challenge for Indonesia. The result of international assessment such as TIMSS and PISA showed low categories to Indonesian education. This low category was defined as the ability of Indonesian student in science still at the stage of recognizing some basic facts from the life and physical sciences (Michael, *et al.*, 2012). The questions in TIMSS was divided into three cognitive domains. They were knowing, applying, and reasoning. Indonesian students' science knowledge was higher in knowing domain (C1-C2) than applying (C3) or reasoning domain (C4-C6). These results indicate the ineffectiveness of science learning in Indonesia.

In Indonesia, teacher centered still can be found. Teachers acted as student's source of knowledge. During the learning process, student activities just listen and write the concepts given by teachers without going through the process of deeper thinking to the concept. So it was apparent that although Indonesian students understand the science concept, they faced obstacles when they got the issues that required deeper thought to the concept.

Brousseau (2002) revealed that there are three factors causing the emergence of learning obstacle. One of them is epistemology obstacle which is appeared because limited application context of student's knowledge. The characteristic of electrolyte and non-electrolyte solution is abstract concept with concrete example. This topic is a basic/prerequisite concept for learning acid-base concept, colligative, electrochemistry, etc. Student's learning obstacle that have been found were classification of electrolyte and non-electrolyte solution, understanding of electrolyte and non-electrolyte solution, dissociation of

electrolyte in water (Artdej, *et al.*, 2010), dan the charged particles in electrolyte solution (Jürgen, *et al.*, 2007).

The result of Devatak (2009) study showed that the student motivation was high when studying the concept at level macroscopic. But their motivation was reduced while studying at submicroscopic and symbolic level. Devetak stated that students encounter obstacles when understanding the submicroscopic level of the ionization/dissociation of electrolyte and non-electrolyte solution in water. Artdej (2010) concluded that the cause of the emergence of learning obstacles was student learn just to memorize without full understand. So in order to overcome the problem of learning obstacle, it was need learning process which can motivate students by giving some challenges to learn the concept deeper, as well as open their way of thinking.

Teacher has major role of overcoming student's learning obstacles. Helus (Ticha, M. & Alena, H., 2013) revealed that there were four basic competences of teacher. They were pedagogical, subject-didactic, pedagogical-organizational, and qualified pedagogical self-reflection competency. Fresee (1999) concluded that the implications of using reflection process can help teacher to develop their professionalism to be more active thinking into practice in improving teaching and student learning. These teacher's competency can be self-developed and can also be used as a solution to minimize and overcome the student's learning obstacle by creating a learning design that is not only centered on pedagogical aspects but also focus on the didactic. One of alternatives design that can overcome student's learning obstacle was a didactic design based on collaborative learning in sharing task and jumping task.

2. RESEARCH METHOD

The method of this study was qualitative research method. Qualitative research method is the process of investigation in explaining complex phenomenon, studying words, a detailed report of the view of respondents, and conducted a study on real situation (Creswell, 2010). The data collected as descriptive data in the form of words written or spoken from research subjects. Respondent Proficiency Test (TKR), interview guideline, and observation sheet were used to collect data.

This study was conducted in one of Senior High School in Bandung. Students from grade 11 and grade 10 second semester of academic year 2015/2016, and a chemistry teacher with 15 years of teaching experience applied as the subjects of this research. Grade 11 students, respondents that followed the initial TKR, were students who have studied electrolyte and non-electrolyte solution. Implementation of the lesson design was done twice in two different grade 10 classes (MIA-2 and MIA-1). Implementation of first class, MIA-2, done according to lesson plan that has been designed. After implementation, final TKR and interview were given to students and teachers as basis for revision the lesson design before next implementation in second class.

The study was conducted through three-stage process of teacher's thinking. They were analysis of the didactic situation before the study (prospective), a didactic situation analysis phase during the learning process (metadidactic), and didactic analysis after learning process (retrospective).

3. FINDING AND DISCUSSION

Student's Epistemology Learning Obstacles on Topic Electrolyte and Non-Electrolyte Solution

The result of identifying the characteristic of student learning obstacle on electrolyte and non-electrolyte solution were obtained by analysis of TKR students from grade 11 and their interview. TKR test developed to identify the learning obstacles of this topic. This TKR contained five item problems that have been validated by three chemistry lecturers and one chemistry teacher. The following indicators of the problems of electrolyte and non-electrolyte solution can be seen in table 1.

Problem number 1, most students cannot apply the electrolyte solution concept in the phenomenon of daily life. Students known that because there are water and electric current, so fish was electrocuted. However, students cannot relate it to the solute (electrolytes substances) or the ionization of the solute in the river water. Based on interviewed several students, they thought the river water was not included in the electrolyte substance. So that, they thought simply because of the electric current was the cause of fish

electrocuted. In addition, students thought if there was water and electric current then definitely be electrocuted. They looked river water seem just like water in general (pure H₂O) instead of an electrolyte solution. These students errors occurred because students did not know that pure water is classified as non-electrolyte substances so water (H₂O) alone can not conduct electricity.

Table 1 Problems Indicators on Topic of Electrolyte and Non-electrolyte Solution

No	Indicators
1	Describe the ability of electrical conductivity of the solution in daily life phenomenon
2a	Analyze the causes of ionic substance can conduct electricity
2b	Write down the ionization reaction of electrolyte solution
3	Classify the strong electrolyte solution, weak electrolyte solution, and non-electrolyte solution based on data
4a	Explain the process of dissolving of strong electrolyte, weak electrolyte, and non-electrolyte substance in water based on the image
4b	Sorting the electrical conductivity strength of the solutions by image of dissolving solutes in water then give the reasons
5	Analyze the electrolyte and non-electrolyte solution based on chemical bonding of solutes.

Problem number 2 was divided into two items. Based on student's answers, they cannot be able to analyze the process of ionization of compound in electrolyte solution. This showed that students' understanding of the ionization process is very lacking. Based on student's interviews, it found that students actually knew the solute (NaCl) have a role in conduct electricity but they cannot explain or relate it to ionization process of solute in water. They pretty believe that because the presence of water, it can conduct electricity. Some of them knew about charged particles (positive and negative) that play the role in conduct electricity, but they didn't know what is it. They thought electron as negative charged particle in this problem. While in problem number 2b showed the inability of students to write down the ionization reaction of electrolyte solution correctly. They thought that NaCl mixed in water made it form new substances. Thus, in this problem, students enter the water (H₂O) into a reagent that will form a reaction between NaCl and H₂O. This happened because they didn't full understand that that the reaction between NaCl and H₂O just a dissolution reaction which is not like chemical reaction that form a new substance,

Problem number 3, based on interviewed of teachers and student book, the experimental data of light bulb test of this problem were light bulb and bubbles. From many student's chemistry book in Indonesia generally light bulb and bubble were the indicators to test electrolyte or non-electrolyte solution. While in text books, the bubble didn't use as indicator, just light bulb. Bubble showed in the reaction produced gases, which were new substances. While in electrolyte topic learn about the moving of ions in solution which is the cause of electrical current through solution. So actually, using bubble as indicator can make student confuse about between ionization reaction and chemical reaction, or between topic of electrolyte solution and electrolysis. The finding of TKR and interview revealed that students simply memorize the characteristic of strong electrolyte, weak electrolyte, and non-electrolyte solution without true understanding of ionization process that occur in solution to be able conduct electricity. So that almost all of student see the strong and weak electrolyte based on the existence of bubbles.

Problem number 4 consisted of two problems. Based on TKR, students who gave wrong answered seen that they cannot able to analyze the process of ionization the solute substances in submicroscopic level. They faced difficulty in describing the purpose of the image. The presence of bubbles in light bulb test was connected to the image. They though the ions or molecules image as bubbles. In problem 4b, students were asked to classifying the solution based on solution's ability to conduct electricity. Based on interview, student thought the size of substances on the image and the substance dissolves speed were associated with their ability to conduct. This was because due to students simply memorize and just

remember only on the basic of their experiment experience or macroscopic level without understanding the microscopic level concept.

Problem number 5, there were five substances which were pure water, the melted KCl, HCl solution, NH₃ solution, and alcohol solution. Students required to classify these substances based on their chemical bonding (metal, ionic, or covalent bonding) and then predict the characteristic of their electrical conductivity in water (strong electrolyte, weak electrolyte, or non-electrolyte). None of students were able to answer correctly to all five substances. Students assume the water bond was ionic bonding because they considered water can conduct electricity well or act as electrolyte. From interview showed that students thought water will ionize to form H⁺ and OH⁻ ion that was the reason they thought water was ionic bond. So students thought that substances that can form ions were ionic bond. They gave same answered to HCl. The problem related to KCl, student thought that because it formed was melt so it was included as metal bond. In problem of NH₃ and alcohol solution, they cannot able to classify their chemical bonding.

Based on finding of TKR and interview showed that students learned just memorize the concept without true understanding of the concept. Even they didn't understand the essential concept of electrolyte and non-electrolyte solution, ionization process of the substances in water. The lab practice of light bulb test which used light bulb and bubbles as indicators of electrolyte and non-electrolyte solution led to student's epistemology learning obstacles. Students learning obstacles that have been identified in this topic were as follows :

1. student considered water can conduct electricity well, so that water was electrolyte,
2. students assumed electron acted as as charge particle that can lead electrolyte solution conduct electricity,
3. student considered water reacted with solute substances and formed new substances,
4. students though the existing of bubbles were influenced on classifying of electrolyte solution,
5. student faced obstacle in explaining the dissolving process of solute in submicroscopic level,
6. student though that chemical bonding of H₂O and HCl were ionic bond because they can ionize to form their ions, and
7. student considered melted form of KCl made KCl classify as metal bond.

Design of Collaborative Learning in Sharing Task and Jumping Task

Design was arranged as a collaborative learning design in sharing task and jumping task. Collaborative learning is a study carried out in groups where students are encouraged to find a variety of opinions or thoughts incurred by each individual in the group by (Sato, 2014). Learning does not happen in unity, but the result of diversity or difference.

This design based on student's learning obstacles and teacher's self-reflection. Teacher's interview was done to identify previous learning process of electrolyte and non-electrolyte solution as teacher's reflection. The result of teacher's interview stated that teacher used lab activity in the previous learning. The lab activity applied light bulb and the present of bubbles as indicator to identify electrolyte solution. Based on TKR results seen that this lab activity created learning obstacles in students. Therefore, learning strategies have to changed toward learning process which can minimize student's learning obstacles, give motivate to students, and provide students the opportunity to think and pour student's ideas with or without the presence of teacher.

Lesson design created follow of didactical desain research (Suryadi, 2010). It consisted of three learning steps which were structured in form of student response prediction and anticipation of teacher to student responses. There are three learning activities which were apperception activity, sharing task activity, and jumping task activity.

In order to overcome the first and fourth learning obstacles were used demonstration of light bulb test. Since the emergence of bubbles result their learning obstacles, the set of light bulb tester that has been used didn't used battery but directly used electricity power source as the supply.

The apperception activity consisted of video of electrolyte solution application in daily life and demonstration of light bulb test. The video was video of people who were electrofishing in river. This video intended to increase student's motivation and to provoking their thought about electrolyte solution application. While pure water, solid salt, salt solution (NaCl), vinegar solution (CH₃COOH), and sugar solution (C₁₂H₂₂O₁₁) were used as the substances of demonstrations. The substances were chosen from the substances that students already known in their daily life. The light bulb test on pure water was intended to overcome the first learning obstacles. Whereas the light bulb test on others substances were intended as introduction to sharing task activity

The problems of sharing task were arranged to overcome the 2nd, 3rd, 5th, 6th, and 7th student's learning obstacles. Students were required to overcome the obstacles by solving five problems in worksheets through group discussion. The problems were questions of C3-C6 domain cognitive regarding applying and reasoning. Students were given the opportunity to think, express their ideas, opinions, discuss to find the concept itself. Teacher anticipation was prepared to student's responses by asking follow-up questions until finding the correct answer (Hendayana, 2013). Students are given specific time to solve the problems, then teacher would confirm the correct answer in classical discussion.

The last activity was jumping task activity. The problems were given in this jumping task was problems from the developing of textbook material (material exceeds the textbook). The problem was prediction by drawing the electrical conductivity process that occurred in light bulb test with samples of sea water, rain water, and consumed water. Students were also asked to explain their basis answers. Sato (2014) stated that the level of student's achievement in jumping task activity is half or a third of students in the classroom is a reasonable situation. On sharing task activity (basic material) only high academic students who capable to follow the learning process. But in this jumping task activity, low academic students will finally understand the true "basic" material. Closing activity was given by inferring whole material that has been studied by students through classical discussion.

Design revision was created almost equal to the first design. Based on the result of teacher's interview, the teacher self-reflection of first implementation were contained to the allocation of time, the emphasis confirmation, eliminating the using of student's source book, and reshuffle the composition of problems in sharing task activity. There was the difference in the composition of worksheet where the first question rearrange to last question. In addition, the confirmation answer on question related to submicroscopic level was added the correct image confirmation of submicroscopic level of particles in strong electrolyte, weak electrolyte, and non-electrolyte. And, the allocation of time in each learning activities replaced where time for sharing task activity became longer.

Implementation of Lesson Design

Implementation of the first design was done in class MIA-2 while the second implementation in class MIA-1. The learning activities consisted of apperception activity, sharing task activity, and jumping task activity. The following was description of the three activities :

1. Apperception activity

Teacher played video of people who did electrofishing in river. At that time of video playback, students seem so motivate where they showed high interest in the video. After the video played, teacher asked question "*why can fish get electric shock when the electrofishing tool dipped into river?*". It showed same with the student's anticipation response and first learning obstacles. Students replied with confidence that the answer was because water can conduct electricity well and because there was electricity current that flowed into water. Based on student's answer, then teacher directed to demonstration to verify whether water can conduct electricity well. During demonstration, teacher asked interactive dialogue by asking questions. Student's answer related to water can conduct electricity well can be proven by demonstration of light bulb test where pure water cannot turn on the light which mean cannot conduct electricity. Actually, pure water can ionize to H⁺ and OH⁻ ions and it has really small

conductivity which if it test by light bulb tester it cannot turn on the light. Then the demonstration continued with solid salt and it still cannot turned the light on. After that, demonstration went to electrolyte and non-electrolyte matter.

At NaCl solution, it can turned on the light brightly. At this moment, students got interest to predict light on at the rest solutions, vinegar and sugar. Student's predictions of both solution were very varied. Student's passion to answered teacher's questions seem so high.

There was not show any significant difference of student's responses in first or second implementation. Just in second implementation, students looked more interest that the first implementation.

2. Sharing Task Activity

From demonstration, students were directed to sharing task activity. Sharing task activity is small group collaborative learning application. Sharing task was done by assigning some problems/tasks related to the subject matter at level of textbook. This activity consisted of five questions. These questions created with the aim for students find the concept of electrolyte and non-electrolyte solution through group discussion.

The first question, students asked to classify solute substance based on chemical bonding by completing the table data in worksheet.

No	Sample	Light Bulb Test	Strong Electrolyte/ Weak Elctrolyte/ Non-electrolyte	Chemical Bonding		
				Metal	Ionic	Covalent
1	Pure Water (H ₂ O)					
2	Salt Solution (NaCl)					
3	Vinegar Solution (CH ₃ COOH)					
4	Melted KCl					
5	HCl Solution					
6	Alcohol solution					

Figure 1. Table of first question

The 6th and 7th student's learning obstacles related to chemical bonding in H₂O, HCl, and melted KCl addressed through this problem. Student can easily answer collum of light bulb test and conductivity properties on substances that have been used in demonstration. But they faced encountered problems when answering samples in number of 5 to 8. At that time, students discuss each other. In the first implementation, most of students open their chemistry book. So the concept that they got more from book than their discussion. Therefore, the second implementation, students forbidden to open their chemistry book unless their notebook. The second implementation, first question move to last question (number 5). This is because, the students didn't allowed to open their book. Because students were already building the concept in the previous problem, the students easily answer this question. To facilitate the flow of learning process, after demonstration, students were directed to next question.

Next question was related to the core concept of electrolyte and non-electrolyte solution. This question was anticipated of 2nd learning obstacle related to particle charged in process ionization. The question was "why strong electrolyte (NaCl solution) can conduct electricity better than weak electrolyte (CH₃COOH solution)?" And next question was "why non-electrolyte, sugar solution (C₁₂H₂₂O₁₁) can't conduct electricity?". These questions, students were asked to examine the major cause of solution can be classify as strong electrolyte, weak electrolyte, or non-electrolyte. First implementation, students can get the answer easily from their book. So that they were less discussion. While in second implementation, students really active in group discussion. Unlike first implementation, just four groups in second implementation can get the concept about ionization. Although the concept wasn't describe well by students, but students though actively in solving the problems. They didn't depend on their textbook but their prior knowledge and their ideas related to the problems. After the time was out to discuss in these

problems, teacher given the confirmation of the correct answer regarding ionization process, process of dissolving, and factors that causing electrolyte can conduct electricity right in classical discussion.

Question number 4 was related to the 5th student's learning obstacle about dissolving process in submicroscopic level. After students knew about the concept of ionization and dissolving process of electrolyte, then on this issue, students were asked to describe the process of ionization that occurs in salt, vinegar, and sugar solution through drawing. In first implementation, the discussion seem good. But students still searched in their textbook. So they just simply redrawing from textbook to their worksheet. While in the second implementation, in the beginning students seem confuse in expressing the concept that already they knew to images. However, discussion withing group and scaffolding from teacher helped them to draw well. There were many variations of ionization models which were they describedof dissolving process of salt, vinegar, and sugar solutions. At the classical discussion, teacher confirmed the correct answer by displaying an animation related to the question. In the first implementation, students were still confused with the correct image. Therefore, the confirmation of the second implementation, teacher added the correct image model of the submicroscopic level of the three solutions to clarify the confirmation.

The next question was related to symbolic level of the ionization process of strong electrolyte, weak electrolyte and non-electrolyte. The first implementation showed students pretty much discuss in order to solve this question. Student textbook was to be the benchmark of their answers. In the second implementation, students feel confused. Just like the epistemological learning obstacle that have been identified, several groups considered water as a reagent in which it reacted with other substances. However, because the students have grasped the concept of ionization, then they are at a loss to solve it. Because they knew that dissolving of electrolyte in water produce ions. These confusions showed that students actively thinking. So that, teacher guide them by asking questions that lead to the correct answer.

3. Jumping Task Activity

In this activity, students were given problems. Students were asked to predict by drawing the process of electrical conductivity from sea water, rain water, and consumed water using light bulb test. Then they asked to describe their reasons.

The using of solutions in daily life were intended to increase student's motivation and to widen their though about electrolyte and non-electrolyte solution. The problem of this jumping task was related to problem in apperception activity about the application of electrolyte solution in daily life. At the beginning, students only knew that water can conduct electricity well. But in sharing task activity, students build the concept of electrolyte and non-electrolyte solution. So at this jumping task problem, students were asked to pour all their knowledge that they have got during learning process.

Both implementations showed positive reaction on this task. They really spirit of trying to solve the problem. The discussion went well.

Sea water sample, all groups predict correctly. But not all groups draw the ionization process well. They considered that sea water contained salt which is strong electrolyte.

Rain water sample, in the first implementation, all groups predict the light dim or included as weak electrolyte. Their reason was related to acidic rain. While in second implementation showed some variation answered. There were groups that answered light wasn't turn on (non-electrolyte) and some of them said the light dim (weak electrolyte). Groups that answered non-electrolyte given the reason because of rain water is formed from condensation evaporation of sea water which is pure water. So there are no ions in rain water. While the other group answered weak electrolyte because rain water is acidic or contain ions although slightly.

In consumed water sample, student answered that it is non-electrolyte because the thought it is pure water. Students assumed the water that they drink should be pure water. They didn't know yet the benefits of ions to human body.

The confirmation of jumping task problem was done by conducting demonstration light bulb test of the three solutions. Students were very interested in this demonstration because they can prove directly

of the result from their thinking/answers. Some of the results of student's answers can be seen in Figure 2 and Figure 3.

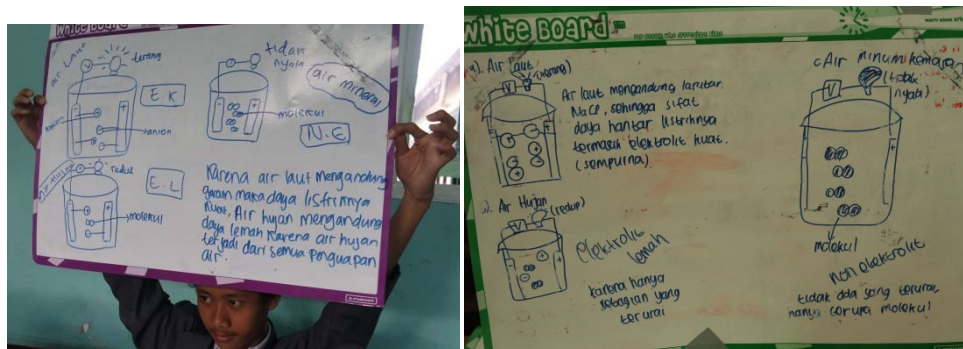


Figure 2. Some of student's answers of jumping task in first implementation

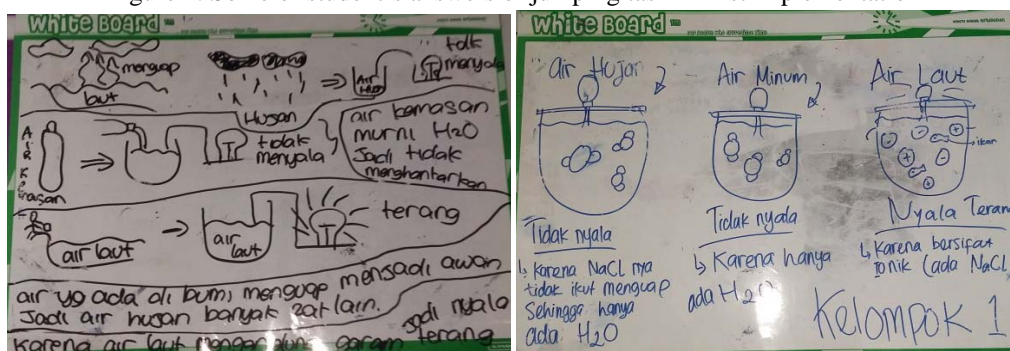


Figure 3. Some of student's answers of jumping task in second implementation

From both implementations revealed some of the low academic students successfully "jumping" with scaffolding from peers and teacher. Student has potential to level up from their actual development level to level of potential development through scaffolding (Vygotsky, 1987). The great progress was shown by respondent with code name SMHN. Teacher stated that he is included to low academic student, lazy, and like to draw in chemistry class. But during implementation of this design, he showed positive improvement. His TKR score ranked first in his class. This was because he has great motivation to learn this topic. And because of he like drawing, he was glad when he faced question to draw (question about submicroscopic level and jumping task question). The following was some of scaffolding from peer:

- SMHN: Kenapa HCl kovalen?
- SWN : H₂S?
- SMHN: HCl
- SWN : HCl, soalnya itu tuh nonlogam sama nonlogam
- SMHN: Oh...

In fact, he was not really active during group discussion. He answered his worksheet by himself then when e have difficulty, he asked his peers. While teacher really pay attention to him as he was target of jumping. The following was some of scaffolding from teacher:

- G : tau kan ini yang ion positifnya yang apa?
- SMHN: positifnya...?
- G : kan ini NaCl berarti positifnya apa?
- SMHN: gak tau
- G : kan NaCl terionisasi, terurai menjadi apa saja?
- SMHN: menjadi positif dan negatif
- G : iya, positifnya apa?
- SMHN: gak tau
- G : waktu ikatan kimia sudah kan. NaCl terurai menjadi apa saja?

SWN : apa sih?
G : NaCl terbentuk dari unsur apa saja?
SMHN: Na dan Cl
G : nah, biasanya Na muatannya apa?
SMHN: positif
G : iya. Na positif kan. Terus Cl?
SMHN: negatif

There were some interesting questions from students which showed they have “jumping”.

SNAP: kalau air mata... kalau dikumpulin bisa juga dong?
SHK : bisa aja. Listriknya ada pasti.
SADJ : coba minum cuka pake garem.
SGAV: jadi reaksi apa gitu yah?
SADJ : iya, itu asem tambah asin.
SADJ : Ibu kalau larutan cuka dicampur larutan garam gimana bu sifat hantarannya?
SADJ : ibu kalau garam campur minyak bisa menghantarkan listrik?

After the implementation was done, students were given TKR to determine whether the identified learning obstacles has been resolved. Based on the TKR results, the learning obstacles were still found but they were reduced. It can be seen from the percentage of the number of students who still have epistemological learning obstacles in Figure 4.

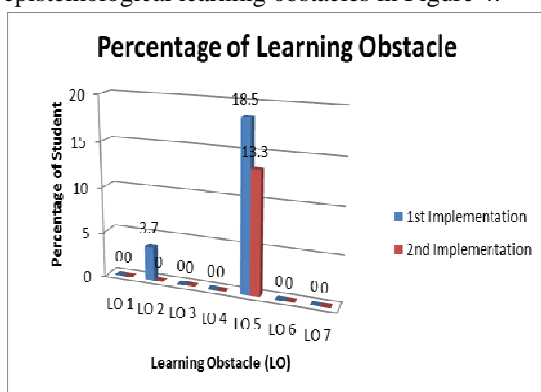


Figure 4. The percentage of students who have learning obstacles in first and second implementation

Based on design implementation, student’s learning obstacles, and teacher’s self-reflection were found some obstacles that need to be revised. They were related to allocation time and confirmation about dissolving process.

4. CONCLUSION

Students experiencing learning obstacles on electrolyte and non-electrolyte topic. These learning obstacles appeared because of students didn’t have opportunity to think deep about the topic. They just received the concept from teacher. So they just memorize the concept without understanding the whole concept.

The design of collaborative learning in sharing task and jumping task was design in order to overcome the student’s learning obstacles through problems and group discussion. There were three activities were included in this design. They were apperception, sharing task, and jumping task activity.

The first implementation showed the lack group discussion during sharing task activity, but in the second implementation revealed great progress in group discussion, activeness, and curiosities of students during the learning process by giving problems related to daily life and student’s interest. From both implementations revealed some of the low academic students successfully "jumping" with scaffolding

from peers and teacher. However, some of the learning obstacles that have been identified before were still found, they just reduced. Based on the result of both implementations, we obtained a lesson design of collaborative learning in sharing task and jumping task on the topic of electrolyte and non-electrolyte solution.

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Creating A Creative Entrepreneurship Teacher Through Lesson Study

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Abstract: The SMK (senior High Vocational School) Graduate in Indonesia not yet match with the expectation of the purpose for support in creating the growth of new entrepreneurship, one of the problem is not enough teacher with entrepreneurship capability either to teach in hardskill or softskill for entrepreneurship. The purpose of this study is to find out the model Training for the Entrepreneurship Teacher's so they able to teach the hardskill and softskill in entrepreneurship, with outcome good quality graduate so the encourage the graduate going to be new entrepreneur. The Locus of the study in Semarang City with the site in SMK N 2 and SMK N 9 with majority in Bussines and Management. The focus of this study is how to transfer the entrepreneurship competency both hardskill and softskill. Using R&D for the research and formulate the model as be developed by Marrelli and Tondora. The effectivity model will be tested using t- test. The output of this research is the Training model for entrepreneurship teacher through Lesson Study.

Keywords : Entreprensurship Teacher; SMK (Senior Vocational High School); Training Model's

1. INTRODUCTION

Teacher is the spearhead of education in which teachers face to face with the students and is the dominant factor that directly affect to the students. Lorin W. Anderson (2004) said that the studies that have been done by the various parties show, that the teacher is one of the dominant factors that influence student learning (Marselus. 2011 2). Jhon Hatti of the University of Auckland in (Marselus 2011) concluded a study that student achievement is determined by a factor of approximately 49% of student characteristics, and 30% comes from the teacher factor. Loxley Heyneman study conducted in 1983 in 29 countries found that among the various inputs or input that determines the quality of education is determined by the teacher-third. The teacher's role is more important amidst the limited facilities and infrastructure as experienced by developing countries. Further submitted that the results of a study of 16 developing countries, teachers contribute to the achievement of 34%, 22% management, 18% of study time and means fsik 26%. (Eko Putro Widoyoko.2008 1).

Entrepreneurship education is an education that has loads of character education or soft skills, therefore, according to Lickona (1992), which looked at the characters are divided into three interrelated areas of the moral knowing, moral feeling, and moral behavior. Learning soft skills must involve three thingsabove.

During this entrepreneurial learning in schools is felt not maximized, even in vocational high schools are expected to create self-employment - new entrepreneurs for the purpose for which is to produce graduates who are BMW (Works, continuing study, Entrepreneur). The number of vocational school graduates who do not have the competence and courage to carry out the business, pointing out that the success of entrepreneurship education is still questionable. From various studies on the number of graduates is not more than 20% of those entering the world entrepreneursip.

The results showed no success rate of entrepreneurial learning in vocational suppose the existence of several causes of the causes include; teachers, material, practical exercises, and a number of instructional time.

The first teacher as noted on the front as the tip of the spear, many teachers of entrepreneurship in schools that do not have the competence. Often the teacher taken any entrepreneurial learning and even of science has nothing to do with self-employment, although to date there has been no graduates that exist on the path to a degree or disciplines entrepreneurship.

Second, the entrepreneurial learning material seems to not have a standard, every teacher simply grafting or buy books on entrepreneurship that have not been standardized, and the bias of the material is merely a concept, not yet able to be applied, especially concerning the character.

Third, in the form of vocational skills for productive skills, there Prakerin that specifically educate children in the world of work and hone skills, while learning self-employment has not been sought their place more adequate practices in addition to simply exist to make the cooperative or the school store for practice.

Last besides other cause has not been identified is the time to learn entrepreneurship is very short, only 2 hours of subjects and only in certain classes.

The purpose of this article is to propose an effective model for train the entrepreneurship teacher in SMK, by using lesson study approach the models will be created as an effective model for creative entrepreneurship teacher.

2. DISCUSSION

This article is intended to provide ideas in forming or motivating for the teachers to be more entrepreneurial means that teachers are able to *membelajarkan* entrepreneurial and able to touch the three aspects of moral, feeling and attitude in students. Implementation of the training model is packed with implementing Lesson Study to be more active and creative teachers.

Lesson study in this training use for lesson study. Lesson study involves groups of teachers meeting regularly over a period of time (ranging from several months to a year) to work on the design, implementation, testing, and improvement of one or several “research lessons” (Stigler & Hiebert, 1999). Utilization is very compatible with their MGMPs group, where teachers will always communicate intensely. The other side entrepreneurial learning is also a matter of culture, where this culture if developed will be able to improve the professionalism because, professionalism is more a culture than just a way to act professionally (Elliott, 2015). In the education the professionalism teacher also including the educational culture as said Professionalism is shaped by the way the educational culture has evolved in a specific place. (Joan Roue,2016).

3. CONCLUSION

The lesson study more effective as a training approach, because the all of member trainee able to participate in all activity. So To create a creative teacher the models of training based on lesson study be needed.

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MODEL MANAJEMEN TEKNOLOGI INFORMASI DAN KOMUNIKASI PADA SMAN DI KALIMANTAN TIMUR

Model of ICT Management on Secondary School in East Kalimantan

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Abstract : *Utilization of Information and Communication Technology (ICT) in education is a necessary. East Kalimantan Government supports the efforts towards the use of ICT in educational institutions. However, based on preliminary survey, it turns to ICT literacy level is still very low. Should be assumed that it is caused by a lack of management of the use of ICT in educational institutions. This research was conducted with the aim to develop the ICT Management Model at High School level in East Kalimantan province. Research using ADDIE Model development framework, where the first year is the analysis stage the circumstances and needs on the ground, the second year such as the design and development phases of the model, and the third year in the form of stages of implementation and evaluation of the model. The models has implemented in schools that use community based management and school based learning community. Based on evaluation, its found that the model can be implemented at schools in East Kalimantan and appropriate with seven roles of ICT in schools.*

Keywords: Management, ICT, School Based Learning Community, East Kalimantan.

1. PENDAHULUAN

Pendayagunaan Teknologi Informasi dan Komunikasi (TIK) dalam pendidikan adalah suatu keharusan. Pemerintah melalui Kementerian Negara Riset dan Teknologi dalam Buku Putih Indonesia 2005-2025 di bidang Informasi dan Teknologi dan deklarasi bersama Mendiknas, Menkominfo dan Menteri Agama telah menggariskan tujuh peran TIK di bidang pendidikan. Ketujuh peran tersebut adalah: 1) TIK sebagai gudang ilmu pengetahuan, 2) TIK sebagai alat bantu pembelajaran, 3) TIK sebagai fasilitas pendidikan, 4) TIK sebagai standar kompetensi SDM, 5) TIK sebagai penunjang administrasi pendidikan, 6) TIK sebagai alat bantu manajemen sekolah, dan 7) TIK sebagai infrastruktur pendidikan. Empat peran yang pertama merupakan pilar bangunan persekolahan modern Indonesia, sedangkan tiga peran yang terakhir merupakan pondasi bagi bangun persekolahan Indonesia. Senada dengan pemerintah pusat, Pemerintah Daerah Provinsi Kalimantan Timur juga mendukung upaya ke arah penggunaan TIK dalam institusi pendidikan. Hal ini tampak melalui upaya penyediaan infrastruktur TIK pada tiap institusi pendidikan. Semua sekolah menengah di Kalimantan Timur telah dilengkapi dengan komputer dan perangkat TIK lainnya.

Berdasarkan survey pendahuluan terhadap institusi pendidikan (dalam hal ini SMA) dan sumber daya yang terlibat dalam dunia pendidikan, ternyata tingkat kemelekan terhadap TIK masih sangat rendah. Masih ditemukan guru atau tenaga kependidikan lainnya yang tidak melek TIK. Dalam observasi tidak ditemukan peran yang optimal dari TIK sebagaimana yang dikemukakan dalam deklarasi bersama tersebut.

Patut diduga bahwa hal ini ditimbulkan oleh kurang tepatnya manajemen penggunaan TIK pada sekolah menengah di Kalimantan Timur. Sehingga dirasa perlu untuk melakukan sebuah penelitian pengembangan untuk menemukan model manajemen penggunaan TIK di sekolah menengah di Kalimantan Timur.

Keluaran yang diharapkan dari penelitian ini adalah adanya publikasi penelitian dan karya ilmiah mahasiswa pascasarjana anggota peneliti, dan adanya model manajemen TIK di SMA, sehingga dapat berperan dalam upaya peningkatan mutu pendidikan di Kalimantan Timur.

2. KAJIAN LITERATUR

a. Manajemen

Istilah manajemen berasal dari kata kerja bahasa Inggris *manage* yang dalam Bahasa Indonesia berarti mengelola. Dari pengertian ini manajemen dapat dipahami sebagai pengelolaan. Manajemen dalam Kamus Besar Bahasa Indonesia (2008), diartikan sebagai penggunaan sumber daya secara efektif untuk mencapai sasaran.

Bila kita mempelajari literatur manajemen, maka akan ditemukan bahwa istilah manajemen mengandung tiga pengertian, yaitu *pertama*, manajemen sebagai suatu proses, *kedua*, manajemen sebagai kolektivitas orang-orang yang melakukan aktivitas manajemen, dan *ketiga*, manajemen sebagai suatu seni (*art*) dan sebagai suatu ilmu (Manullang, 2009). Dalam *Encyclopedia of the Social Science* dikatakan bahwa manajemen adalah suatu proses dengan mana pelaksanaan suatu tujuan tertentu dilaksanakan dan diawasi.

b. Fungsi dan Proses Manajemen

Pada umumnya manajemen dibagi menjadi beberapa fungsi, yaitu merencanakan, mengkoordinasikan, mengawasi, dan mengendalikan kegiatan usaha untuk mencapai tujuan yang diinginkan secara efektif dan efisien (Amrullah dan Haris, 2004). Fungsi manajemen adalah proses yang saling berkaitan secara keseluruhan untuk mencapai tujuan organisasi atau badan usaha.

George R. Terry (2006) menyatakan fungsi manajemen meliputi perencanaan (*planning*), pengorganisasian (*organizing*), pelaksanaan (*actuating*), dan pengawasan (*controlling*) atau disingkat POAC yang dilaksanakan untuk menentukan serta mencapai sasaran-sasaran yang telah ditetapkan melalui pemanfaatan sumber daya manusia serta sumber daya lainnya. Dari pengertian ini dapat dipahami bahwa dalam proses pencapaian tujuan dimulai dari tindakan perencanaan, pengorganisasian, pelaksanaan, dan pengawasan yang dikerjakan dengan mengerahkan dan memanfaatkan sumber daya yang ada.

1) Perencanaan (*Planning*)

Dalam konteks organisasi, perencanaan dapat diartikan sebagai suatu proses menetapkan tujuan dan sasaran, menentukan pilihan-pilihan tindakan yang akan dilakukan, dan mengkaji cara-cara terbaik untuk mencapai tujuan masa depan yang telah ditetapkan sebelumnya.

2) Pengorganisasian (*Organizing*)

Pengorganisasian merupakan proses pemberian perintah, pengalokasian sumber daya serta pengaturan kegiatan secara terkoordinir kepada setiap individu dan kelompok untuk menerapkan rencana. Kegiatan-kegiatan yang terlibat dalam pengorganisasian mencakup tiga kegiatan, yaitu: (1) membagi komponen-komponen kegiatan yang dibutuhkan untuk mencapai tujuan dan sasaran dalam kelompok-kelompok, (2) membagi tugas kepada manajer dan bawahan untuk mengadakan pengelompokan tersebut, dan (3) menetapkan wewenang di antara kelompok atau unit-unit organisasi.

Dalam pengorganisasian dikenal istilah KISS (Koordinasi, Integrasi, Simplifikasi, dan Sinkronisasi) dalam rangka menciptakan keharmonisan dalam kegiatan organisasi.

3) Pelaksanaan (*Actuating*)

Pelaksanaan merupakan implementasi dari perencanaan dan pengorganisasian dimana seluruh komponen yang berada dalam satu sistem dan satu organisasi tersebut bekerja secara bersama-sama sesuai dengan bidang masing-masing untuk dapat mewujudkan tujuan.

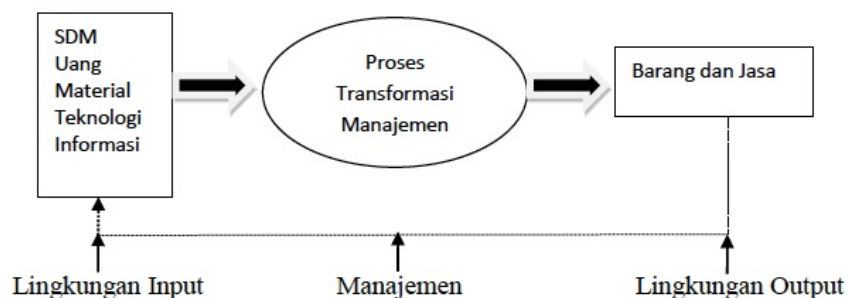
4) Pengawasan atau Pengendalian (*Controlling*)

Bagian terakhir dari proses manajemen adalah pengawasan atau pengendalian. Pengawasan merupakan pengendalian semua kegiatan dari proses perencanaan, pengorganisasian, dan pelaksanaan, apakah semua kegiatan tersebut memberikan hasil yang efektif dan efisien serta bernilai guna dan berhasil guna. Pengendalian dimaksudkan untuk melihat apakah kegiatan organisasi sudah sesuai dengan rencana sebelumnya. Fungsi pengawasan atau pengendalian mencakup empat kegiatan, yakni (1) menentukan standar prestasi, (2) mengukur prestasi yang telah dicapai selama ini, (3) membandingkan prestasi yang

telah dicapai dengan standar prestasi, dan (4) melakukan perbaikan jika terdapat penyimpangan dari standar prestasi yang telah ditetapkan.

c. Sistem Manajemen

Sistem dapat diartikan sebagai kumpulan dari bagian-bagian yang saling berhubungan antar satu dengan yang lainnya yang secara bersama-sama mencapai tujuan tertentu. Sedangkan sub sistem itu sendiri adalah bagian kecil dari suatu sistem yang lebih besar. Gambar 1 di bawah menunjukkan suatu organisasi sebagai suatu sistem yang terkait.



Gambar 1. Manajemen sebagai suatu sistem.

d. Teknologi, Informasi, dan Komunikasi (TIK)

Pengertian teknologi informasi adalah tata cara atau sistem yang digunakan oleh manusia untuk menyampaikan pesan atau informasi. Seiring dengan perkembangan komputer dan peralatan komunikasi modern, pengertian teknologi informasi dan komunikasi dapat diartikan sebagai pemanfaatan perangkat komputer sebagai alat untuk memproses, menyajikan, serta mengelola data dan informasi dengan berbasis pada peralatan komunikasi. Jadi dua komponen pokok dalam Teknologi dan Informasi dan Komunikasi adalah peralatan komputer dan peralatan komunikasi (Maryono dan Patmi, 2008).

Komponen Teknologi Informasi dan Komunikasi (TIK)

Komponen utama teknologi informasi dan komunikasi adalah komputer/sistem komputer, komunikasi, dan tahu-guna (*know-how*).

1) Komputer

Komputer/sistem komputer digunakan untuk menerima, menyimpan, memproses, menampilkan data, dan informasi. Yang dimaksud dengan sistem komputer meliputi *hardware*, *software* komputer, dan teknologi *storage* (penyimpanan). Sistem komputer terdiri dari komputer, *software*, informasi, pemrograman, manusia, dan komunikasi.

2) Komunikasi

Fasilitas komunikasi yang sering digunakan di antaranya adalah modem, *multiplexer*, *concentrator*, pemroses depan, *bridge*, *gateway*, dan *network card*.

3) Mengetahui Penggunaan (*Know-How*)

Kemampuan dan kemanfaatan teknologi informasi akan semakin terasa, apabila *user* sepenuhnya mengetahui apa, kapan, bagaimana teknologi tersebut digunakan secara optimal. Selain itu, *user* juga perlu mengetahui kapan menggunakan teknologi informasi untuk menyelesaikan masalah dan mengeksplorasi peluang yang terbuka luas (Asmani, 2011).

Tujuan Pemanfaatan Teknologi Informasi dan Komunikasi (TIK)

Peran dan fungsi teknologi informasi dalam konteks yang lebih luas, yaitu dalam manajemen dunia pendidikan, juga telah dikemukakan oleh Alavi dan Gallupe dalam Asmani (2011).

Dalam studinya Alavi dan Gallupe menemukan beberapa tujuan pemanfaatan TIK, yaitu:

- 1) Memperbaiki *competitive positioning*
- 2) Meningkatkan *brand image*
- 3) Meningkatkan kualitas pembelajaran dan pengajaran
- 4) Meningkatkan kepuasan siswa
- 5) Meningkatkan pendapatan
- 6) Memperluas basis siswa
- 7) Meningkatkan kualitas pelayanan
- 8) Mengurangi biaya operasi
- 9) Mengembangkan produk dan layanan baru

Karenanya, tidak mengherankan jika saat ini banyak institusi pendidikan di Indonesia yang berlomba-lomba berinvestasi dalam bidang TI untuk memenangkan persaingan yang semakin ketat (Asmani, 2011).

Peran TIK dalam Dunia Pendidikan

Perkembangan di bidang TIK dari masa ke masa sangat pesat dan perannya dalam kehidupan manusia dapat dirasakan dalam berbagai bidang kehidupan manusia, baik secara individu ataupun kelompok (organisasi atau perusahaan).

- 1) Bagi para siswa atau mahasiswa

Komputer dan jaringan komputer (intranet dan internet) memberikan kemudahan bagi para siswa atau mahasiswa. Para siswa dapat memperoleh bahan-bahan pembelajaran melalui perpustakaan elektronik (*e-library*) atau buku elektronik (*e-book*) untuk mendapatkan koleksi perpustakaan berupa buku, modul, jurnal, majalah, atau surat kabar. Kehadiran internet juga memungkinkan dilakukannya pembelajaran jarak jauh (*e-learning*). Maksudnya untuk mendapatkan materi pelajaran, para siswa atau mahasiswa tidak harus terikat dengan ruang dan waktu di ruang kelas pada jam-jam pelajaran. Mereka dapat memperoleh materi melalui komputer di rumah yang tersambung dengan internet atau melalui warnet-warnet yang memberikan layanan akses internet. Bahkan, dimungkinkan para siswa atau mahasiswa melakukan komunikasi dengan guru atau dosen melalui fasilitas *e-mail* atau berbicara atau bertatap muka melalui fasilitas *teleconference/video-conference*.

- 2) Bagi Guru atau Sekolah

Di samping untuk kegiatan pembelajaran, teknologi informasi dan komunikasi juga dapat digunakan untuk kegiatan administratif para guru. Misalnya, mengetahui data siswa, seperti nama, orang tua siswa, asal, latar belakang pendidikan sebelumnya, maupun data akademik seperti jadwal, nilai-nilai siswa, dan catatan prestasi. Kegiatan pemrosesan nilai untuk menentukan nilai rata-rata, *ranking*, kelulusan, dan kejuaraan sekolah dapat dilakukan dengan mudah, cepat, dan tepat. Para guru tidak perlu lagi melakukan perhitungan secara manual dengan bantuan mesin hitung kalkulator karena apabila nilai sudah dimasukkan ke dalam sistem komputer, proses penghitungan akan dilakukan oleh komputer juga dan hasilnya dapat dilihat dalam sekejap.

- 3) Bagi Orang Tua

Penggunaan teknologi informasi dan komunikasi memungkinkan orang tua dapat memantau perkembangan pendidikan anaknya melalui komputer dan internet sehingga orang tua dapat mengetahui dan melihat hasil pembelajaran anaknya, mulai nilai harian, penugasan, nilai ujian, dan prestasi secara keseluruhan.

e. Manajemen TIK

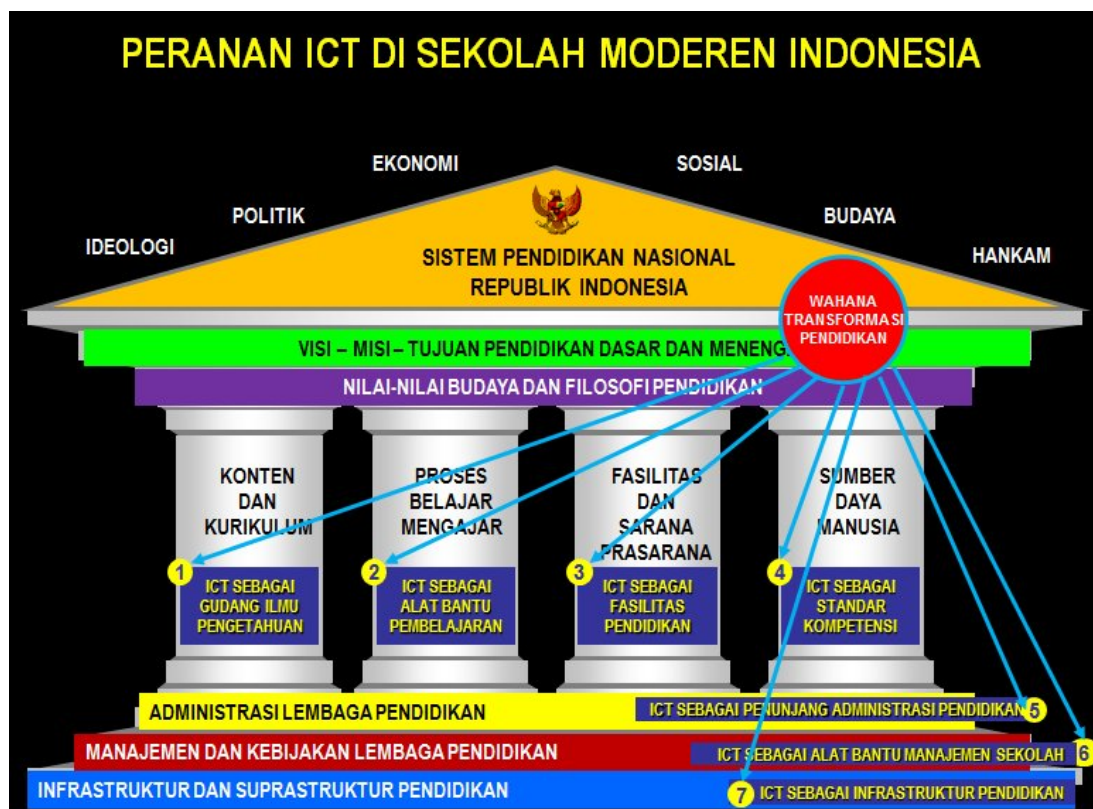
Manajemen TIK telah lebih dahulu dikenal dalam sektor swasta, baru kemudian pada sektor publik (*governance*). Manajemen TIK dalam sektor publik, termasuk pendidikan dikenal dengan istilah *IT Governance*. Weill dan Ross (2004:2) mendefinisikan *IT Governance* sebagai keputusan-keputusan yang diambil, yang memastikan adanya alokasi penggunaan TIK dalam strategi-strategi organisasi yang bersangkutan. *IT Governance* merefleksikan adanya penerapan prinsip-prinsip organisasi dengan memfokuskan pada kegiatan manajemen dan penggunaan TIK untuk pencapaian tujuan organisasi. *IT governance* pada intinya mencakup pembuatan keputusan, akuntabilitas pelaksanaan kegiatan penggunaan TIK, siapa yang mengambil keputusan, dan mengelola proses pembuatan dan pengimplementasian keputusan-keputusan yang berkaitan dengan TIK. Contoh bidang cakupan IT governance sektor publik adalah keputusan pemerintah yang menentukan siapa yang memiliki wewenang dan tanggungjawab dalam pembuatan keputusan tentang berapa jumlah investasi yang dapat dilakukan pada sektor pendidikan dengan memanfaatkan TI.

Weill&Ross (2004:10) menyatakan bahwa suatu *IT Governance* yang efektif adalah *IT Governance* yang mampu menjawab tiga pertanyaan berikut, yakni: (1). Keputusan-keputusan apa yang harus diambil untuk memastikan terlaksananya manajemen secara efektif dan penggunaan TIK secara efektif?; (2). Siapa yang harus membuat keputusan-keputusan berkaitan dengan penggunaan TIK?; (3). Bagaimana keputusan-keputusan ini dibuat dan dimonitor?

Menurut Weill dan Ross (2004:114), prinsip-prinsip penerapan IT Governance yang baik adalah sebagai berikut:

- 1) Sempel; artinya mekanisme pengimplementasian IT governance mesti mendefinisikan dahulu tanggungjawab dan tujuan yang jelas dari tiap-tiap organisasi tersebut. Organisasi publik kita yang pada intinya bertanggungjawab dalam pemberian pelayanan kepada masyarakat harus disinergiskan dengan tujuannya yaitu kesejahteraan masyarakat
- 2) Transparan; artinya adanya mekanisme yang efektif dan proses yang jelas bagi siapapun yang berkaitan dengan keputusan yang dibuat tentang IT
- 3) Kecocokan; artinya mekanisme *IT Governance*-nya harus mengikutsertakan individu-individu yang *capable* di bidangnya.

Beberapa Komponen utama sekolah berbasis TIK setidaknya terdiri dari: (1) Konten dan Kurikulum, (2) Proses Pembelajaran, (3) Sarana dan Prasarana, (4) Kompetensi SDM Sekolah, (5) Sistem Administrasi dan Manajemen Sekolah, (6) Infrastruktur dan Suprastruktur. Dalam *blue print* TIK untuk pendidikan, fungsi-fungsi TIK digambarkan sebagai sebuah bangunan gedung. TIK Terdiri dari pondasi, tiang, atap, sebagaimana terlihat seperti gambar berikut (Blue Print Peranan TIK, Periode 2005-2015:



Gambar 2. Peranan TIK di Sekolah Modern Indonesia

Dari gambar di atas, dapat dijelaskan 7 peranan TIK di sekolah modern Indonesia yang akan menerapkan Sekolah sebagai Learning Community sebagai berikut:

1) TIK sebagai Gudang Ilmu Pengetahuan

Artinya dengan TIK sumber ilmu pengetahuan menjadi begitu kaya bahkan melimpah, baik ilmu pengetahuan inti (*core content*) dalam pelajaran sekolah maupun sebagai materi pengaya pembelajaran (*content supplement*). Pada fungsi ini internet memiliki peran besar sebagai sumber ilmu pengetahuan yang dapat diakses secara luas yang didalamnya telah terkoneksi dengan ribuan perpustakaan digital, jutaan artikel/jurnal, jutaan e-book, dan lain-lain.

2) TIK sebagai Alat Bantu Pembelajaran

Artinya bahwa pembelajaran saat ini lebih mudah dengan bantuan TIK, untuk menghadirkan dunia di kelas dan dapat disajikan kepada seluruh siswa melalui peralatan TIK seperti multimedia dan media pembelajaran hasil olahan komputer seperti poster, grafik, foto, gambar, display, dan media grafis yang lainnya. Pemanfaatan CD Interaktif, Video Pembelajaran, Multimedia presentasi, e-learning termasuk pada bagian ini.

3) TIK sebagai Fasilitas Pendidikan

Dalam hal ini TIK sebagai sarana yang melengkapi fungsi sekolah sebagai lembaga pendidikan, terutama fasilitas-fasilitas yang bernuansa elektronik seperti laboratorium komputer, peralatan di laboratorium bahasa, ruang multimedia, studio rekaman suara, studio musik, studio produksi video dan editing.

4) TIK sebagai Standar Kompetensi

Artinya TIK sebagai mata pelajaran yang kita kenal Mata Pelajaran TIK. Mata pelajaran ini berisi standar kompetensi yang mengenalkan tentang TIK kepada siswa yang diatur sesuai dengan kurikulum.

5) TIK sebagai Penunjang Administrasi Pendidikan

Peran TIK sebagai Penunjang Administrasi Pendidikan lebih mengarah pada unsur pengelolaan institusi pendidikan, seperti sekolah dan kampus. Peranan yang dimaksud adalah kemampuan TIK sebagai teknologi penunjang administrasi operasional institusi pendidikan agar pengolahan berbagai sumber daya yang dimiliki dapat terjadi secara efektif, efisien, optimal, dan terkontrol dengan baik. Pemanfaatan aplikasi manajemen kelas dan mata ajar, misalnya akan mempermudah terlaksananya proses operasional dan administrasi pembelajaran secara terintegrasi, yang selama ini masih dikelola secara manual, seperti mekanisme absensi, penggandaan bahan ajar, pelaksanaan ujian, penghitungan nilai evaluasi, hingga pemberitahuan hasil belajar (Asmani, 2011).

6) TIK sebagai Alat Bantu Manajemen Sekolah

Teknologi Informasi dan Komunikasi (TIK) dapat dikembangkan dan dimanfaatkan sebagai alat bantu manajemen sekolah dalam pengambilan keputusan manajerial lembaga pendidikan. Untuk itu lembaga pendidikan perlu mengembangkan sistem informasi manajemen eksekutif sekolah, sistem penunjang keputusan, sistem informasi manajemen berbasis sekolah dan sebagainya. Dari berbagai sistem yang dikembangkan dapat diperoleh informasi yang akurat dan terkini sebagai dasar manajemen sekolah mengambil kebijakan sekolah. Syarat dari proses pengambilan keputusan adalah tersedianya informasi yang lengkap dan berkualitas. Informasi yang dimaksud itu pada dasarnya diambil dari seluruh data hasil rekaman pada proses operasional dan administrasi sehari-hari. Dengan menggunakan fitur pembuatan laporan berdasarkan kriteria tertentu, ditambah melalui kemampuan untuk melakukan analisa *what if* (Asmani, 2011).

7) TIK sebagai Infrastruktur Pendidikan

Peran TIK sebagai Infrastruktur Pendidikan diperoleh dari kenyataan bahwa untuk dapat menjalankan keseluruhan kapabilitas teknologi yang telah dipaparkan di atas, TIK harus dapat menjadi salah satu infrastruktur penting yang dimiliki oleh institusi pendidikan. Kaitannya dalam hal ini, sebuah sekolah atau kampus harus memiliki koneksi transmisi data dengan cara terhubung langsung ke infrastruktur telekomunikasi, baik melalui jalur *terrestrial*, kabel laut, maupun satelit. Kemudian, di atas infrastruktur tersebut perlu dibangun sebuah jaringan komputer yang dapat menghubungkan berbagai alat elektronik dan/atau digital yang ada di lingkungan institusi pendidikan terkait. Hanya dengan jejaring inilah maka keseluruhan inisiatif pengembangan TIK sebagai media teknologi pendidikan dapat terwujud.

Dari penjelasan ketujuh pilar peranan TIK di atas, semuanya saling mendukung antara peran yang satu dengan yang lain. Dari ketujuh pilar tersebut, penelitian ini akan menfokuskan dan membahas mengenai peranan TIK sebagai Penunjang Administrasi Pendidikan.

3. METODE PENELITIAN

Jenis penelitian ini adalah penelitian pengembangan (*Research and Development*). Penelitian pengembangan yang dilakukan akan menggunakan kerangka pengembangan Model ADDIE, dimana tahun pertama merupakan tahapan analisis keadaan dan kebutuhan di lapangan, tahun kedua berupa tahapan pendesainan dan pengembangan model, dan tahun ketiga berupa tahapan implementasi dan evaluasi terhadap model. Penelitian melibatkan Sekolah Menengah Atas pada tiga Daerah Tingkat II di Provinsi Kalimantan Timur, yaitu Kota Samarinda, Kabupaten Kutai Barat dan Kabupaten Berau. Penelitian melibatkan empat orang mahasiswa S2 Pascasarjana Manajemen Pendidikan di Universitas Mulawarman. Penelitian menghasilkan sebuah model konseptual yang sudah teruji berupa sebuah buku

pedoman model manajemen TIK di Sekolah Menengah. Model yang sudah divalidasi kemudian diimplementasikan dan dievaluasi.

4. HASIL DAN PEMBAHASAN

a. Hasil Penelitian

Berdasarkan hasil temuan penelitian tahun pertama terkait penggunaan TIK dalam ketujuh perannya, dikembangkan sebuah model manajemen TIK di sekolah menengah di Kalimantan Timur. Model ini mengacu pada IT Governance dengan model Federal. Untuk ke praktisan pelaksanaan Model pada tahun ketiga, dikembangkan produk berupa Buku Pedoman Model. Untuk memahami model dapat dilakukan dengan memahami Buku Pedomannya. Sehingga hasil penelitian pada tahun kedua berupa sebuah buku pedoman model yang telah melalui tahapan validasi.

b. Pembahasan

Pengembangan Buku Model melalui tahapan Pengembangan Draft (Mengikuti Langkah Desain), dan Focus Group Discussion (FGD) serta Validasi Pakar (Mengikuti Langkah Develop). Berikut ini disajikan pembahasan hasil pada tiap tahapan pengembangannya.

1) Pembahasan Pengembangan Draft Awal

Draft awal dikembangkan berdasarkan hasil analisis penelitian tahun I dan hasil diskusi bersama anggota kelompok, termasuk anggota penelitian Tahun I yang juga ikut memberikan komentar, dan dosen Administrasi Pendidikan pada Pascasarjana Pendidikan FKIP Universitas Mulawarman. Berdasarkan hasil diskusi ditetapkan bahwa model mengacu pada IT Governance dengan bentuk model Federal. Bentuk ini dipilih berkaitan dengan tipe kepemimpinan yang biasa digunakan oleh kepala SMA, serta ide bahwa akan diterapkan Sekolah sebagai Learning Community. Hal ini sesuai dengan pendapat Budiati (2013) bahwa Federal model adalah model yang paling sesuai diterapkan pada organisasi publik di Indonesia, berkaitan dengan usaha peningkatan koordinasi, komunikasi dan sharing information antar institusi publik di Indonesia. Alasan selanjutnya adalah, karena pada intinya federal model mengutamakan keikutsertaan pimpinan pusat dan tiap unit-unit terkait dalam pembuatan keputusan yang berkaitan dengan TI dan akuntabilitas pelaksanaan TI pada organisasi publik.

Model manajemen yang dipilih disusun berdasarkan fungsi manajemen yang terdiri dari 4 fungsi, yaitu perencanaan (planning), pengorganisasian (organizing), pelaksanaan (actuating), dan pengawasan (controlling) yang biasa disingkat POAC. Perencanaannya menganut pola contingency planning (perencanaan situasional), sedangkan pengorganisasian menganut KISS (Koordinasi, Integrasi, Simplifikasi, dan Sinkronisasi). Pada draft awal POAC nya global untuk ketujuh peran TIK di sekolah menengah.

Buku pedoman yang dihasilkan pada draft awal ini terdiri atas ikhtisar model, landasan model, definisi operasional istilah yang terkait model, tahapan pelaksanaan model secara global, pengaturan lingkungan model, dan penilaian model.

2) Pembahasan Hasil Focus Group Discussion I

Berdasarkan hasil FGD I yang diadakan di SMAN 1 Melak Kutai Barat, didapat masukan berupa hambatan-hambatan yang biasa dijumpai kepala sekolah dalam manajemen penggunaan TIK di sekolahnya. Guru juga menyampaikan mekanisme pelaksanaan dan pengawasan penggunaan TIK.

Perbaikan yang dilakukan meliputi tahap perencanaan diharapkan sudah melibatkan semua guru, pada tahapan pengorganisasian, hendaknya diberikan SK pada petugas yang ditunjuk. Pengaturan pelaksanaan peran TIK di Sekolah menengah hendaknya mempertimbangkan prioritas mata pelajaran, namun tidak menghilangkan kesempatan pada mata pelajaran lainnya.

Masukan yang diberikan dijadikan bahan perbaikan draft awal sehingga menjadi Draft Hasil FGD I. Draft ini yang kemudian diajukan untuk validasi pakar manajemen dan pakar TIK.



Gambar 3. Suasana FGD I di Ruang Guru SMAN 1 Melak Kutai Barat

3) Pembahasan Hasil Validasi Pakar Manajemen

Pakar manajemen yang diminta untuk memvalidasi model manajemen adalah Prof. Dr. H. Sufyarma Marsidin, M.Pd. Beliau adalah Guru Besar Administrasi Pendidikan di Universitas Negeri Padang. Beliau dipilih karena dari semua jenjang, pendidikan beliau adalah Administrasi Pendidikan, dan sebelumnya beliau pernah menjabat sebagai Kepala Dinas Pendidikan Kabupaten Agam Provinsi Sumatera Barat. Berdasarkan pertemuan awal dengan beliau, beliau menyarankan agar fungsi POACnya dibuat lebih spesifik untuk masing-masing beserta langkah yang lebih rinci pada tiap-tiap fungsinya.

Walaupun saran yang diberikan sedikit, tapi mempunyai dampak yang besar terhadap perubahan draft hasil FGD I, karena harus dipecah untuk 7 peran TIK di Sekolah Menengah. Sehingga validasinya dijadwalkan kembali 1 bulan kemudian.

Dikarenakan setelah tanggal 7 November tidak diperbolehkan lagi melakukan penggunaan anggaran, maka validasi kedua tidak bisa dilaksanakan dengan proses tatap muka. File dokumen buku model dan lembar validasinya dikirimkan untuk mendapatkan hasil penilaian. Berdasarkan hasil penilaian dan komentar yang diberikan, model manajemen dalam bentuk buku pedoman ini layak diujicobakan lebih lanjut. Sebenarnya masih ada hal yang perlu didalami dengan pakar manajemen terkait usul pada langkah pembuatan POAC yang spesifik itu ternyata ketika dibawa dalam forum FGD II menjadi pertanyaan tersendiri, karena banyak langkah tersebut yang sebenarnya ditetapkan pada waktu bersamaan.

4) Pembahasan Hasil Validasi Pakar TIK

Bersamaan dengan tahapan validasi oleh pakar manajemen, juga dilakukan validasi oleh pakar TIK. Pakar TIK yang dimintai bantuan untuk memvalidasi buku pedoman model adalah Zainal Arifin, S.Kom., M.Kom. Yang diminta untuk divalidasi adalah kelayakan model ditinjau dari kecukupan alat serta program yang diperlukan dalam menjalankan peran TIK di Sekolah Menengah. Yang dikomentari adalah draft hasil FGD I. Berdasarkan hasil validasinya dapat disimpulkan bahwa buku pedoman model sudah layak untuk diujicobakan. Beliau tidak memberikan komentar untuk perbaikan. Demikian juga ketika dikonsultasikan bahwa bentuk buku model mengalami perubahan berdasarkan usulan validator pakar manajemen beliau mengatakan tidak apa-apa juga disain bukunya disusun seperti usulan pakar manajemen.

5) Pembahasan Hasil Focus Group Discussion II

Draft Buku Pedoman Model yang telah diperbaiki dari hasil validasi pakar manajemen dan pakar TIK kemudian dibawa sebagai bahan dalam FGD II. Karena rencana implementasi akan dilaksanakan di Kutai Barat, maka FGD II kembali dilakukan di SMAN I Melak Kutai Barat. Berdasarkan FGD II, mengemuka persoalan bahwa tahapan yang ada dalam draft baru ada yang prosesnya bersamaan sehingga ada kalimat berulang dalam tiap tahapan peran TIK di Sekolah Menengah. Sehingga sebagian besar peserta menyarankan kembali ke draft awal seperti di FGD I.

Setelah coba dijelaskan proses pengembangan draft buku model dari awal sampai akhir, peserta diskusi dapat memahami. Apalagi diberi contoh bahwa mungkin beberapa sekolah tidak diharuskan melaksanakan model untuk semua peran TIK.

Hasil diskusi FGD II kemudian dijadikan draft akhir.

6). Pembahasan Hasil Implementasi dan Evaluasi.

Berdasarkan pelaksanaan implementasi awal di SMAN 1 Melak, dan implementasi lanjutan di SMAN 1 dan SMAN 4 Berau, melalui wawancara dengan civitas sekolah, yaitu kepala sekolah, wakil kepala sekolah dan guru, serta siswa dapat disimpulkan bahwa model manajemen ini dapat dilaksanakan dengan baik dan cocok dikembangkan di SMAN di Kalimantan timur.

5. KESIMPULAN

Model manajemen TIK pada SMAN di Kalimantan Timur ini cocok untuk dilaksanakan pada sekolah yang menerapkan manajemen berbasis sekolah, dan sekolah yang akan dijadikan komunitas belajar (School Learning Community).

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**MAKING TEACHING MATERIALS FROM CONTEXTUAL TEACHING
RESOURCES IN THE COURSE PENGEMBANGAN BAHAN AJAR STUDY
PROGRAM OF EDUCATIONAL BIOLOGY - FACULTY OF MATHEMATIC AND
SCIENCES MALANG STATE UNIVERSITY**

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Abstract

One competency to be achieved students participating in the course Instructional Materials Development in Biological Science Education Prodi UM is able to make teaching materials. Types of teaching materials referred to in this research is a handout, student worksheet and video learning. The three types of teaching materials created by students from contextual learning resources, the learning resources in the environment around the campus UM chosen by students. This research is a classroom action research (CAR) combined with lesson study (LS). Subjects were 27 students participating in the course Instructional Materials Development in Study Program of Educational Biology, Faculty of Mathematic and Sciences Malang State University, Odd Semester 2016/2017. Learning resources contextual selected students and the material its biology is: 1) Polyclinic of Malang State University (blood pressure and senses the eye), 2) Pond Tugu Hall of Malang City (motion on the lotus plant), 3) the Flower Market Splendid Malang City (classification of plants), 4) animal market Splendid Malang City (classification of animals), 5) Plant Princess Shame (*Mimosa pudica*) on campus of Malang State University (motion seisonasti), 6) Forest City Malabar Malang City (classification of plants), 7) Tourism Education Karangates District Sumber Pucung Malang (classification of plants), 8) Tourism education Sumber Maron District Gondanglegi Malang (classification of plants), and 9) Terminal of waste reception Talangagung District Gondanglegi Malang . All nine of learning resources also showed nine groups of students @ 3. Before making teaching materials student establishes basic competence from content standards of the Curriculum 2013 in accordance with the learning resources. Furthermore, the students formulate indicators of competence which is a translation of basic competence. **Cycle 1.** The *Plan* is the lesson plan preparation of cycle 1 collaboratively with fellow researchers. *Do* is the application of the lesson plan in cycle 1. And *see* is observation and reflection of cycle 1. In cycle 1 kind of instructional materials created are handouts. Handout also equipped with photographs taken at the source of learning. Handout product groups of students presented and discussed compliance with handout format, basic competence and indicator of competence, language, and the truth of biological materials. Results of cycle 1 students in general have made a handout in accordance with the format specified. The drawback especially in conformity beetwen basic competence and indicator of competence formulation, language and truth material. Handout repair based on the discussion. **Cycle 2.** *Plan* is the lesson plan preparation of cycle 2 collaboratively with fellow researchers. Lesson plan emphasis on correct language use and effective. *Do* is the application of the lesson plan in cycle 2. And *see* is observation and reflection of cycle 2. In cycle 2 types of teaching materials created is student worksheet - experimental and non-experimental. Student worksheet is also equipped with photographs taken at the source of learning. Student worksheet product groups of students presented and discussed compliance with handout format, basic competence and indicator of competence, language, and the truth of biological materials. Results of second cycle students in general have made student worksheet accordance with the format specified. Still found deficiencies in conformity beetwen basic competence indicator formulation, language and truth material. Student wroksheet repair group based on the discussion. **Cycle 3.** In cycle 3 types of instructional materials created are learning video. *Plan* is the lesson preparation of cycle 3 collaboratively with fellow researchers. In lesson plan stressed video clear image capture brightly and bouncy, the narrative is clear and obvious, and the language correctly and effectively. *Do* is the application of the lesson plan in cycle 3. And *see* is observation and reflection of cycle 3. Video product groups of students presented and discussed compliance with video format, basic competence and indicator of competence, image clarity, language, and the truth of biological materials. Results of cycle 3 students generally have made video in accordance with the format specified. Deficiencies found in clarity of the student-made video image, pictures video still swaying, clearless narrative. Video repair group based on the discussion. Making teaching materials (handouts, workseheets and vidio), were presented and discussed, as well as a revised increase students' ability to create teaching materials. This is showed by an increase in the quality of teaching materials before and after revision.

Keywords

teaching material, teaching resources

1. INTRODUCTION

According to the Directorate of High School (2008: 6): teaching materials are all kinds of materials that are used to assist teachers in implementing the teaching and learning activities. Material for teaching material can be written or unwritten material. Pannen, Paulina and Purwanto. (2001) stated that meant teaching materials are substances or materials arranged in a systematic lessons, used by teachers and learners in the learning process. Arranged in a systematic means of teaching materials aligned with basic competence (KD) and the indicators of competence (IK) which teacher formulated. Able to create teaching materials is one of the competencies that must be accomplished students participating in the course (MK) Development of Subjects in Study Program (Prodi) Biology Education Faculty of Mathematics and Natural Sciences (MIPA), State University of Malang (UM). Three types of teaching materials in this research is a handout, student worksheet (LKS) and video learning.

Biology teaching materials developed from the learning resources. Learning resources are all things that have the possibility or the potential to be used as teaching materials. Possible or potential associated with compliance with KD and IK. What is meant by contextual learning resources in this study is a learning resource in the UM campus environment associated with the biological activity of human beings. In this study there are 9 learning resources selected by students Instructional Materials Development course in Biological Science Education Prodi UM Odd Semester 2016/2017. In one week course material development was conducted for 4 hours of lectures respectively. One hour lecture for 50 minutes.

The handout is written teaching material prepared by a teacher to enrich the knowledge of students. In the Oxford Dictionary of terms 389, handout prepared statement is given. The handout is a statement that has been prepared by the speaker (teacher). Handout materials have relevance to KD and IK that must be mastered by the learner. Handout material can be obtained by downloading from the Internet or to summarize the few books. Handouts can include graphics, pictures or photos. Additionally handouts can be developed from contextual learning resources as long as it aligned with KD and IK.

Student worksheet (LKS) or worksheet learners (LKPD) by Andi Prastowo, (2011: 204) is defined as teaching material printed in the form of sheets of paper containing materials, summaries, and directives implementation of the tasks to be done by the participants students, which refers to the competence KD / IK achieved tasks are ordered in the LKS must be clear KD and IK to be achieved by students. The tasks on the worksheets can not be done by the students as well, if not equipped with any other book or other reference material related to their duties. The tasks given to students may be a task or a theoretical and practical tasks. The theoretical task, for example the task of reading a certain article, then make a resume to be presented. LKS theoretical task may be questions that must be resolved by the students. LKS theoretical subjects in the course of biology normally associated with biological material that are abstract, for example, the structure of DNA and RNA, the structures and the life cycle of the virus, and so on. The theoretical LKS is also called non-experimental LKS. While the task may be practical in laboratory work or field work, such as morphological observation or move the plant somewhere. LKS contains practical tasks also called experimental LKS. Instructions Ingenhouz practicum is an example of an experimental LKS. Experimental and non-experimental LKS can be developed from the learning resources.

Use of LKS facilitate and assist teachers in implementing the learning. Student-centered learning (student centered) facilitating students to perform scientific work. As a result of scientific work LKS also facilitates students carry constructivist learning. Biology learning video is video video containing images associated with KD and IK in a biological subject. For example videos about double fertilization, videos about mitotic division and so on. Students have chosen and set 9 contextual learning resources for the development of teaching materials.

2. RESEARCH METHODOLOGY

This research is a classroom action research (PTK) combined with lesson study (LS). Objective: a) describe the implementation of the manufacturing learning teaching materials (handouts, worksheets and video) in the course Instructional Materials Development, b) describe the students' ability to create teaching materials,

c) describes the involvement of students in the learning process. The purpose of a measured by implementation learning both on the faculty and the students. Enforceability of data obtained through observation using the observation sheet reference. Observations were made by two people observer, the researcher (lecturer) and one member of the researcher. The purpose of b measured by assessing the media before and after the revision. Objective C is measured through activity and involvement of students in class discussions. Data such as the number of students involved in class discussions derived from observations 2 observer, the researcher (lecturer) and one member of the researcher.

The combined measures between PTK and LS are summarized in the following table.

Table 1 Step joint between PTK and LS

Step	PTK	LS
1	Cycle planning	Plan
2	Implementation palnning	Do
3	Observation	See
4	Reflection	See

Preparation of the RPP is done collaboratively with the members of the researcher. Acting as an observer at the stage of observation / see is the chairman and one member of the researcher.

Subjects were 27 female participants of the course students Instructional Materials Development in Education Studies Program UM Biological Science Odd Semester 2016/2017. Class held every Tuesday at to 1-4 in a row, every lecture hours and 50 minutes. Contextual learning resources selected students and the material its biology is: 1) Polyclinic UM (blood pressure and senses the eye), 2) Swimming Tugu City Hall Malang (motion on the lotus plant), 3) the Flower Market Splindid Malang (classification of plants), 4) animal market Splindid Malang (classification of animals), 5) Forest City Malabar Malang, 6) Wildlife Educational Karangates, Sumberpucung, Malang (classification of plants), 7) Plant Princess Shame on the campus of UM, 8) Places Educational Resources Maron, Gondanglegi, Malang, 9) Educational tour and waste treatment Talangagung Kepanjen Malang.

At first lesson or meeting face to face the activities are 1) orientation lecture, 2) students and assign the members of the group, 3) a group of students set learning resources that will be a source of learning for the creation of teaching materials, 4) students along with lecturer discuss the meaning of teaching materials and learning resources, goals or benefits of teaching materials and the types of teaching materials, 5) students along with lecturer discuss themeaning of handouts, how to create format of handout wich agreed. The discussion was done because in cycle 1 group of students made a handout from the selected learning resource. 6) Furthermore, in the rest of meeting face to face each group of students designed a handout of learning resources selected in the form of soft file. Making handout by a group of students carried out of hour lecture.

Cycle1.

The planning stage or plan is the preparation or Learning Implementation Plan (RPP) cycle 1 collaboratively with fellow researchers. Preparation of the RPP is done after hours. The implementation stage or do is the application of the RPP in the learning cycle 1. Implementation Cycle 1 held on to the second meeting face to face.

Observation phase or see consisting of two sequential events, namely observation and reflection. Observation phase also take place at the stage of second face-to-face. In stage two each group of student present their student handouts that have been made. Through class discussion handout presented discussed in the aspect 1) KD and IK, 2) format handouts, and 3) the truth of biological materials. Lecturers provide reinforcement during class discussions. Based on presentation handouts and class discussion in find that almost all the students have been able to create a handout in accordance with an agreed format. There are two handouts formulation in accordance with the criteria IK less good formula. Biological material in handouts right or no wrong. Found some small errors writing the language. Presentation and discussion took place about 3 hours of face to face meeting. In one hour the last of face to face meeting, all student groups rivised handout that has been made. Handouts have been improved submitted to the lecturers in the form of files in the next meeting. In the last hour, lecturers passing everythings associated with the making of LKS.

Based on observation or see in cycle 1 the result are 1) Learning of Cycle 1 on faculty and students implemented 100% in accordance with the RPP. 2) Students have been able to make handouts in accordance with an agreed format. The material presented in the handouts have been correct. IK deficiencies in the formulation and language. The ability of students to make the handouts grow after the class discussion. This is shown by the results of the revised handout used input from class discussion., 3) Involvement of students in class discussions is quite large, reaching 18 people.

Reflection of Cycle 1. Conducted just between researcher with one members of the researcher. The contents of reflection: a) Lecturers and students have been implementing learning as on RPP, b) Students have been able to create a handout in accordance with an agreed format and this ability to grow through class discussion. c) The material in handout no errors, d) Lack of IK formulation and language will be fixed on to the second cycle. e) Open class only attended by lecturer and one member of the researcher.

RPP repair on cycle 2: 1) It is emphasized to formulate IK accordance with the rules applicable. 2) Emphasized to use the language properly and correctly in accordance with the rules applicable. 3) designate the name of the students to participate in class discussions. 4) Notice to lecturers biology education courses to participate in the open class.

Cycle 2. Plan is the preparation of Learning Implementation Plan (RPP) for cycle 2 collaboratively with one member of researchers. In cycle 2 stages of implementation or Do (application of the RPP in cycle 2) takes place at a 3rd meeting face to face. Learning activities are: 1) presentation and discussion of worksheets that have been created groups of students together with lecturer for about 3 hours of lectures; 2) Revision LKS based on feedback during class discussions. In the last of lecture hour, the lecturer expressed related matters vidio manufacture of learning.

Observations or see second cycle act during presentations and class discussions on 3rd of face to face meeting. Class discussion about the format worksheets, formulas IK and the truth of biological materials. LKS presentations and discussions lasted for nearly three hours of lectures (face to face meeting). Lecturers provide reinforcement during class discussions. Based on the class discussion is known to all groups of students have been able to make LKS accordance with an agreed format. Biological material in the LKS has been presented properly. Small errors still occur on aspects of language. The formulation is less precise IK found in 4 LKS. In one hour the last of 3rd face to face meeting, all groups of students correct deficiencies in the worksheets that have been created. LKS has been repaired submitted in the face next to the lecturers in the form of file ..

Based on observation or see in cycle 2 result: 1) Learning cycle 2 on the faculty and students implemented 100% in accordance with the RPP. b) Students have been able to make LKS accordance with an agreed format. The material presented in the LKS has been true. IK deficiencies in the formulation and language. The ability of students to make LKS increase after the class discussion. This is shown by the results of the revised LKS input from class discussion., C) Involvement of students in class discussions increased from 18 in cycle 1 to 22 in cycle 2. d) open class only attended by researchers and members of the researcher.

Reflection of cycle 2: 1) all students have been able to make the LKS in accordance with an agreed format. 2) There are still found deficiencies in the formulation of IK and the language that will be fixed in cycle 3, 3) who attended the open class only researchers and members of the researcher

RPP repair on cycle 3: 1) It is emphasized to formulate IK accordance with the rules applicable. 2) Emphasized to use the language properly and correctly in accordance with the rules applicable. 3) designate the name of the students to participate in class discussions. 4) Notice to lecturers biology education courses to participate in the open class.

Cycle 3. Plan is the preparation of Learning Implementation Plan (RPP) of cycles 3 collaboratively with fellow researchers. In cycle 3 phase Do (RPP application in cycle 3) takes place on the 4th face to face meeting and consist four activities: 1) a group of students presented the vidio that have been made. 2) students along with faculty to discuss vidio presented a group of students in classroom discussions. Lecturers provide reinforcement during class discussions. Vidio presentations and class discussions lasted for approximately three hours of lectures. 3) at 1 hour last lecture students improve video based on feedback during class discussions.

Observations or see take place during class discussion. In a class discussion discussed about the video format, topics and formulation of IK and the truth of biological materials. According to presentations and class discussions the The result are 1) The student group has made vidio accordance with an agreed format. 2) narration in visual form and audio form. Some visual narrative made main image became not clear. Oral

narrator voice is no less obvious or clear so that the information submitted becomes less clear. Discussed the advantages and disadvantages of visual narrative and oral forms, and how to overcome them. 3) Some shooting video still rocking, and there is not yet stable lighting or light-dark. 4) The biological material is presented correctly, 5) Still found the use of Indonesian are not in accordance with the applicable rules. 6) Student video makers should create a scenario that becomes a reference / guide video manufacture. At 1 hour lecture last students improve the video based on feedback during class discussions. Lecturers informed that students can take advantage of the operator and the software and hardware available in the laboratory of biology learning for video editing. Video revised submitted to lecturers in the form of soft file no later than the next meeting..

Reflection of cycle 3 carried out between researchers with colleagues / members of the researcher. The contents of reflection: 1) Students have been able to make video accordance with an agreed format. 2) The narration in the form video visual or audio form (oral) should be made by pressing or reducing weaknesses. 3) Taking pictures video sought not shake. Students can take advantage of the operator and the software and hardware available in the Learning Laboratory of Biology for video editing. 4) The material presented properly. 5) It is necessary to edit the language in video that the language used in accordance with the applicable rules of language. 6) before taking video images should first create a scenario that will be a reference or guidelines video manufacture. 6) open class only attended by researchers and one member of the researcher. Same with the open class in cycle 1 and cycle 2

3. FINDING AND DISCUSSION

PTK 3 cycles combined with LS implemented in MK Instructional Materials Development at Odd Semester 2016/2017 in Biological Science Education Prodi-UM. Types of teaching materials developed from the learning resources that selected students are handouts, worksheets and learning video biology. The findings obtained during the study were:

- a) The selection of learning resources by students was appropriate and in accordance with the contents satandar maple KD in high school biology were also identified and selected students. This may imply that the students have been able to take advantage of learning resources to prepare teaching materials in order to achieve student competence.
- b) Students have been able to make handouts, worksheets and learning video accordance with an agreed format. The format has been discussed and agreed upon before the cycle 1. Therefore, students have been able to apply the formatting in making teaching materials. The ability of students to make teaching materials to grow through presentations and class discussions.
- c) There are no mistakes and errors in the presentation of biological materials. This means that a student has understand materials used in teaching materials.
- d) During cycles 1, 2 and 3, open class only attended by researchers and one member of the researcher. This is due to the busyness of other lecturers and so can not attend the open class.
- e) found some inaccuracies IK formulation, both terms as penjabar of KD, choice of the verb, and no formula IK duplicate (containing two abilities at once). But through class discussion and reinforcement by lecturers, students' ability to formulate IK continued to rise for the better.
- f) Constraints in manufacturing is still found video image shake, the image somewhat blurred, visual narrative that covers images, oral narrative voice is less clear. Students improve quality video by edit the images, language and narrative improvements by utilizing the equipment and operators in laboratory of biology learning faculty of mathematic and sciences. Through class discussions students are also aware that should create a scenario in advance as a reference in shooting video.
- g) Overall, the making of teaching materials (handouts, worksheets and learning video), presentations and class discussions to make students actively involved in the learning process, increased from cycle 1 to cycle 3.

4. CONCLUSION

The conclusion of PTK combined with LS are: 1) learning in cycle 1, 2 and 3 have been carried out as crimped RPP both the lecturers and students, 2) students have been able to make teaching materials (handouts, worksheets and video) of learning resources selected by students. Membuat students' ability in the teaching materials continue to grow through class discussion. Revision of teaching materials has been considering input in classroom discussions. 3) The number of students involved in the learning process (discussion class)

continues to grow, cycle 1 = 18, 2 = 22 cycles and cycle 3 = 25 orang. Overall, the making of teaching materials (handouts, worksheets and learning video), presentations and class discussions to make students actively involved in the learning process, increased from cycle 1 to cycle 3. 4) Open class is only attended by researchers and one member researcher. The flurry of lecturers can be the cause of open class and reflection solely between researchers and one member researcher.

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