The Improvement of Teachers' Competences through Lesson Study at SMP Negeri 6 Kota Ternate

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Abstract: This research aimed at improving teachers' competence in teaching and learning process through *Lesson Study* at SMP Negeri 6 Kota Ternate. This is a descriptive research using quantitative and qualitative approach. It described the detail of teaching and learning process through *Lesson Study*. The subject involved teachers of science who has joined the *Lesson Study* Training. The data were collected through interview, observation and documentation. Learning process through *lesson study* had done in 3 cycles following time allocation and topics chosen. Every cycle consist three (3) phases: 1) Plan, 2) Do and 3) See. The data were analyzed in descriptive quantitative and qualitative. It required data of reduction, data of presentation and data of verification. The result showed that the improvement of teacher's competence in teaching and learning process was 76.77% with high qualification. This finding also supported by the increasing of students' learning activities was 68.13% of active qualification. Additional supporting factors came from positive response of headmaster, curriculum responsibility and teachers from discipline knowledge at school. Unless, the obstacles factors were limitation of time, very less teacher involved in this research and difficult to arrange schedule with teacher while invited as observer.

1 INTRODUCTION

An issue of education to be immediately solved is quality of education, especially quality of learning. From the various conditions and potentials that exist, efforts that can be made with regard to improving the quality of learning in schools are developing students-oriented and facilitating community needs for sustainable education, (Catherine Lewis, 2004).

Currently, *Lesson Study (LS)* is interesting to be discussed as an alternative approach to maintain the problem of teaching and learning practices that have been considered less effective. Teaching and learning process in Indonesia generally tended to be conventionally through oral communication techniques. This is more emphasize on how the teachers teach (teacher-centred) than on how the students learn (student-centred), and as results it was not contributing much to improve the quality of student learning processes and outcomes. To change the teaching practice to be more on student-centred learning is indeed not easy, especially among teachers who belong to the laggard group (refusal to change / innovation), (Slamet Mulyana, 2007).

The stages of *Lesson Study (LS)* implementation as follows: 1) Plan (Teaching Planning), 2) Do (Carrying out the teaching planning), 3) See (Carrying out reflection and discussion with the observer). *Lesson Study (LS*) includes the latest approach to improve Teaching and learning in the development of learning activities, (Hendayana et al., 2006).

In 2012, Khairun University in particular FKIP was entrusted and funded by DIKTI to implement Lesson Study (LS) in lecturers. In this activity the lecturer carries out learning by applying the Lesson Study (LS) approach. From the results of these activities, in 2013 FKIP conducted a socialization of Lesson Study (LS) to stakeholders (education offices, middle and high school principals and teacher representatives from each school). But from the results of the socialization, teachers have not implemented Lesson Study (LS) in schools (classes). Therefore, through this research we strive to apply the Lesson Study (LS) learning approach in schools

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through collaboration with teachers. In the collaboration together (1) identify learning problems, (2) plan learning steps as identified problem solving efforts, (3) carry out learning carried out by one of the selected teachers (agreed), while other teachers and the research team observed the learning process, (4) evaluated the learning process that had been carried out, (5) improved learning planning based on the results of the evaluation, (6) carried out the learning again, (7) re-evaluated the learning that had been carried out, and (8) shared) experience and findings from the results of the evaluation to other teachers.

However, the fact shows that each student has different on ability, character, and background that require different treatment. In this case Lesson Study seems to be used as an alternative to encourage changes in learning practices in Indonesia towards an effective direction. Lesson study (LS) was developed for the first time in Japan which was carried out as a program for developing teacher professionalism. Lesson Study (LS) is believed to be successful in improving learning practices. According to Sparks (1999), Lesson Study (LS) is a collaborative process carried out by a group of teachers in identifying learning problems, planning improvements in learning, implementing learning with one teacher teaching while other teachers as observers, evaluating and revising learning, implementing learning which has been revised based on the results of the evaluation, evaluates again, and shares (disseminates) the results to other teachers. While Friedkin (2005) defines Lesson Study (LS) as a process that involves teachers working together to plan, observe, analyze, and improve learning. Learning in Lesson Study (LS) is often also referred to as "research lesson" or research learning.

According to Baba (2007), Lesson Study (LS) refers to the process of teachers progressively strive to improve their learning methods by working with other teachers. Whereas Sukirman (2006) views Lesson Study (LS) as a model of educator professional development through the study of collaborative and sustainable learning based on the principles of collegiality and mutual learning to build learning communities. Thus Lesson Study (LS) is not a learning method or learning strategy. However, in a Lesson Study activity (LS) various methods, strategies, or learning approaches can be used that are appropriate to the situation, conditions, and problems faced by educators. Lewis (2002), describes these processes as steps of collaboration with teachers to plan (plan), observe (observe), and reflect (reflect) on learning (lessons). Furthermore, he stated, that Lesson Study (LS) is a complex process, supported by collaborative goal setting, observation in collecting data about student learning, and agreements that provide productive opportunities for discussion on difficult issues. *Lesson Study* (*LS*) is essentially a continuous activity that has practical implications in education.

Referring to some of the above meanings, *Lesson Study (LS)* can be interpreted as a collaborative process from a group of teachers to jointly: (1) identify learning problems felt by the teacher (one or a group of teachers), (2) planning learning steps (as identified problem solving efforts), (3) carrying out learning carried out by one of the selected teachers (agreed), while other teachers observe the learning process, (4) evaluate the learning process that has been done (5) improve learning planning based on evaluation results (6) carry out learning again, (7) re-evaluate learning that has been carried out, and (8) share (disseminate) the experiences and findings of the evaluation results to other teachers. A series of steps can be grouped into three stages or activities, namely (1) planning (PLAN), which includes activities to identify learning problems, learning innovation ideas, and designing learning, (2) implementation (DO), namely implementing learning design , and (3) evaluation or reflection (SEE), namely evaluating the implementation of learning. Thus, the stages form a repetitive stage which can be described as follows:

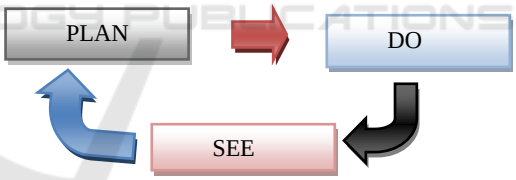

Figure 1: Activity Design of Lesson Study.

In general, there are three steps of Lesson Study activities (LS), namely (1) the planning stage (Plan), (2) the implementation stage (Do), and (3) the reflection stage (See). The following are described in each steps.

1. Planning (Plan)

This stage aims to produce learning plans that are believed more effective to teach students and generate student participation in learning. In planning, the teacher collaboratively shares ideas in developing learning designs to produce ways of organizing teaching materials, learning processes, and preparing learning aids. Before implementing it

in class, the learning design that has been prepared is then simulated. At this stage, observational procedures and instruments are required for observation.

2. Implementation (DO)

The implementation phase of Lesson Study (LS) aims to implement learning design. In the implementation process, one teacher acts as the implementer of the Lesson Study (LS) and the other teacher as the observer. The focus of observation is not on the appearance of the teaching teacher, but rather on the student learning activities based on procedures and instruments agreed upon at the planning stage. Observers are not permitted to interfere with the learning process.

3. Reflection

The purpose of reflection is to find the advantages and disadvantages of implementing learning. The activity begins with the delivery of impressions from the learner and is then given to the observer. Critics and suggestions are directed at improving the quality of learning and wisely delivered without degrading or hurting teachers who teach. Positive input can be used to redesign better learning.

Formulation of Competence

Republic of Indonesia Law Number 20 of 2003 concerning National Education System (UU-Sisdiknas) followed by Republic of Indonesia Law Number 14 of 2005 concerning Teachers and Lecturers (UU-GD) and Republic of Indonesia Government Regulation Number 19 of 2005 concerning National Education Standards (PP-SNP), conceptually and empirically requires adjusting the level of policy that will be used as a reference for compiling various programs, including teacher education.

Competency is defined as the roundness of mastery of knowledge, skills and attitudes displayed through the performance that is expected to be achieved by someone after completing an education program. According to Kepmendiknas No. 045 / U / 2002, competence is defined as a set of intelligent and responsible actions that a person has as a condition to be considered capable by the community in carrying out tasks according to a particular job.

As is stated in Article 28 of RI Law No. 19/2005, a teacher must have four types of competencies. *First*, personal competence, which is a personal ability that reflects a stable, mature, wise, authoritative personality, becomes a role model for students, and has a noble character. *Second*, pedagogic competence is the ability related to the understanding of students and managers of learning that is educational and dialogical. *Third*, professional competence, namely the ability related to mastery of learning material in a broad and in-depth field of study which includes mastering the substance of the contents of subject matter curriculum in school and scientific substance that cover the curriculum material, as well as adding scientific insight as a teacher. Fourth, social competence is the ability of educators as part of the community to communicate and interact effectively with students, fellow educators, education staff, parents / guardians of students, and the surrounding community. *The four competencies* are formally proven with an educator certificate. Minimum academic qualifications are obtained through higher education, while educator competency certificates are obtained after completing the educator's professional education program and passing the educator certification exam. This test aims to control the quality of the results of education, so that the hope of someone who has passed is believed to be able to carry out the task of educating, teaching, training, guiding and evaluating the learning outcomes of students. According to Houston W. R (1974), a person's level of competence does not only refer to the quantity of work, but also points to the quality of his work. This means that someone who has passed the certification, besides the quantity of work is adequate, the quality of his work is also good.

According to Amy J. Phelps & Cherin Lee (2003), good teachers (especially science teachers) should access preconceptions about learning carried out by future teachers, who are able to develop specific pedagogics that are in accordance with the disciplines to be taught and teachers who teach according to what they think (not only based on facts). The survey by Kelly Morgan Deters (2006) shows that there are still many teachers who teach too many topics in class and pursue material targets by referring to the standard handbook. This results in teacher professionalism not being formed and students having difficulty understanding the concept. It was further stated that it is better to teach fewer topics but focus and depth, so that learning becomes more meaningful in meeting needs and building students' thinking skills. By encouraging interest in

students, students will be able to expand their own understanding on other topics.

Pedagogic competence is the ability that must be possessed by the teacher regarding the characteristics of students viewed from various aspects such as physical, moral, social, cultural, emotional, and intellectual. This implies that a teacher must be able to master learning theory and the principles of learning that educate because students have different characters, characteristics, and interests. With regard to the implementation of the curriculum, a teacher must be able to develop a curriculum at the level of each education unit and adapt it to local needs. Teachers must be able to optimize the potential of students to actualize their abilities in the classroom, and must be able to assess the learning activities that have been carried out. The teacher's pedagogical competence consisted of 5 indicators with 22 competency items assessed. The five indicators include: 1) Ability to understand students, 2) Ability to make learning design, 3) Ability to carry out educational and dialogical learning, 4) Ability to evaluate learning outcomes, and 5) Ability to develop students to actualize various potentials they have.

2 METHODS

Based on the following research questions 1) How was the process of *lesson study* in improving teacher competence? 2) What supporting factors and obstacles had involved in *LS* process? This is a descriptive research using quantitative and qualitative approach. It described the detail of teaching and learning process through *Lesson Study*. The subject involved teachers of science who has joined the *Lesson Study* Training. The data were collected through interview, observation and documentation. An interview was conducted to get datail data of teacher pedagogic competency through *LS.*Observation techniques are carried out by observing the behavior, events or activities of the person or group of people studied, then recording the results to find out what really happened. (Aunu RJ, 2013). The Guttman scale is used to get clear information with Yes (1) or No (0) in the form of a checklist, (Sugiyono, 2011). Documents are interpreted as written notes or images stored about something that has happened. Documents are facts and data stored in various materials in the form of documentation. (Aunu RJ, 2013).

The documentations were used to obtain data and information in the form of writing, pictures, photos of lesson study implementation activities.

2.1 Research Subject

The research subjects were all the teacher of science in SMP Negeri 6 Kota Ternate consist of 9 teachers who had been conducted *Lesson Study*. However, only one teacher who fulfilled the requirement.

2.2 Research Design

A reserach design can be describe as follows:

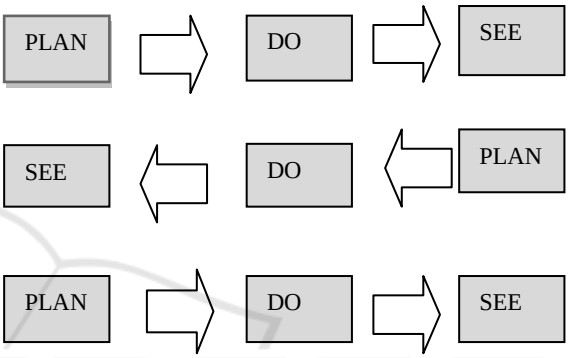

Figure 2: Research Procedure.

2.3 Research Procedure

The procedure of this research using learning system development method applied in lesson research with Lewis's lesson study model (2002). The implementation is planned in 3 stages that are adjusted to the time allocation and subject matter chosen. Each stage consists of 3 activities, namely: 1) Planning (Plan); 2) Implementation and Observation (Do); 3) Reflection (See). The procedure of research is determining the stages, namely:

First stage:

a. Planning (PLAN) stage of learning planning group members compile lesson plans (RPP), process of assessment instruments and learning observation sheets.
b. Implementation and observation (DO), lesson plans that have been arranged together are implemented in the classroom by the teacher implementing the learning. Group members as observers will collect data during learning process

c. Reflection (SEE), aims to overcome problems, by modifying the previous plan according to field data. The learning process that has been carried out needs reflection and is analyzed immediately after learning is complete. The results of reflection are used as input for the improvement or revision of the following lesson plan.

Second stage:

The second stage step is carried out as in the first stage but is preceded by re-planning based on the results obtained in the first stage, so that the weaknesses that occur in the first stage do not occur in the second stage.

Third Stage:

The third step is carried out as in the first and second stages, but preceded by re-planning based on the results obtained in the second stage, so that the weaknesses that occur in the second stage do not occur in the third stage.

2.4 Data Analysis Techniques

Data analysis was carried out in quantitative and qualitative descriptive using the flow approach when carried out by Plan, Do, See activities. The data analysis technique refers to the opinion of Sukardi (2006), namely:

2.4.1 Data Reduction

Data reduction as a selection process, focusing on simplification, abstracting "rough" data obtained from field data. The process of data analysis begins by examining all available data from various sources. In this case the researcher records the results of observations and interviews and questionnaires relating to the problems that have been formulated in background section.

2.4.2 Presentation of Data

The presentation of data was used in a form of narrative text accompanied by charts and tables whose contents relate to this research.

2.4.3 Data Verification

Verification or conclusion is an important step. Since the beginning of data collection, researchers had identified symptoms that have meaning. In this verification data the results have been examined based on the data obtained.

The validity of the data refers to several indicators, Putra (2012), mention that there are four indicators that are set to check the validity of data in qualitative research, the four indicators are *credibility*, *transferability*, *dependability*, and *confirmation*. *Credibility* is that research must be trustworthy. *Transferability* is the response, interpretation, the research can be utilized, transferred to other conditions and situations. *Dependability* is a complete, in-depth and detailed research process related to procedures, stages and use of various data collection techniques. *Confirmation* is a necessity for researchers to discuss and build understanding with the participants in connection with findings of the research.

To find out the improvement of teacher's pedagogic competence, Guttman's scale is used. Where the Guttman scale is a scale that wants a type of firm answer, like right-wrong answers, yes-no, never-never, negative, high-low, good-bad, and so on. There are only two intervals, that is, agree and disagree. it can be made in multiple choice or checklist. For positive answers such as correct, yes, high, good, and etc it given a score of 1; whereas for negative answers like wrong, not, low, bad are given a score of 0.

To improve teachers' pedagogic competence, it used N-gain formula as follow:

$$\text{N-Gain} = S_{post} - S_{pre} / S_{max} - S_{pre}$$

Ket:
S_{post} : Score of posttest
S_{pre} : Score of pretest
S_{maks} : Score of maximum ideal

Score of criteria can be seen in the following table:

Table 1: Score of Criteria of N-Gain.

Score	Scale
$g > 0.7$	High
$0.3 < g \leq 0.7$	Medium
$g \leq 0.3$	Low

3 RESULTS AND DISCUSSION

Based on the data description of analysis results, the improvement of pedagogical competence through *lesson study* showed that there was an increasing of teacher's pedagogical competencies of 76,77% with high qualifications. Where the teacher is one of the

keys to success students in learning. Teachers who are competent in their fields are one factors that influence student learning activities and outcomes. This can be seen from the analysis of student activity after learning through *Lesson Study* that was obtained at 68.13% active qualifications. The success of a learning depends on the four competencies of the teacher in managing learning, one of which is pedagogic competence.

Pedagogic competencies possessed by teachers in teaching have an important role in the teaching-learning process and determine the success of student learning level. Teachers are said to have pedagogical competencies of at least 1) Ability to understand students, 2) Ability to make learning design, 3) Ability to carry out educational and dialogical learning, 4) Ability to evaluate learning outcomes, and 5) Ability to develop students to actualize the various potentials they have. From the five competency indicators, based on the results of observations on *Lesson Study* activities, they were obtained: 1) the teacher model was able to develop a learning plan based on the strategies chosen effectively and efficiently, 2) the teacher model understood the characteristics of students by utilizing the principles of collegiality, 3) the teacher model carries out conducive learning, 4) the teacher model was able to facilitate students to develop their various potentials, 5) the teacher model was also able to carry out educational and dialogical learning even though not all students can interact when teaching and learning activities and group discussions took place. In the implementation of learning activities (DO), 6) the teacher model was able to evaluate after learning process but, has not carried out an evaluation when the teaching and learning process taking place.

After the implementation of learning (DO), it is continued with reflection (SEE). At the beginning of the reflection activity, the model teacher is given the opportunity to convey impressions about the learning activities that have been carried out. In the case of the lesson study activities presented, the model teacher said that at first he felt nervous when learning because the observers were lecturers and teachers of other fields of study. After the model teacher conveys his impressions, observers / observers take turns responding to their responses and impressions of the observed learning. Reflection activities revealed some responses from observers / observers that the learning process carried out by the model teacher had been good starting from preparation to implementation. Some things that still need to be improved are in terms of grouping, there are still some students who respond less to the activities that are in learning so that the student looks inactive and the model teacher must still see the planned time of 2 X 45 minutes.

There were several factors that support the implementation of lesson study activities as an effort to improve teacher pedagogical competence, namely high support from the school management, high appreciation given from the principal and curriculum to the implementation of Lesson Study as one efforts to improve teacher competence in the classroom. In line with the implementation of Lesson Study revealed several inhibiting factors or constraints experienced, namely limited time, lack of teacher involvement, and difficulty in arranging schedules to invite teachers to become observers due to the full schedule of teachers.

4 CONCLUSIONS

The implementation of *Lesson Study* takes place well, where each lesson study stage starting from the planning stage (PLAN), implementation (DO) to reflection stage (SEE) can increase teacher pedagogical competence by 0.55 with the medium category and supported by an increase student activity 0.41 medium category.

The researcher found several supporting factors in the implementation of *Lesson Study* in SMP 6 Ternate, namely the **full support** of the principal, curriculum and other study teachers, while the inhibiting factors in the implementation of *Lesson Study* were limited time, lack of teacher involvement, difficulty in managing a schedule to invite teachers to become observers due to the teacher's full schedule.

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