INNOVATIVE TEACHING MATHEMATICS THROUGH LESSON STUDY

(Workshop of PGSD students and teachers of SD campus UPI Purwakarta region)

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Abstract. This study aimed to provide a real experience of learning mathematics for primary school lesson study - based in improving the ability of mathematical understanding with Lesson Study design. The main participants are PGSD UPI students and elementary school teachers in Purwakarta. To analyze data, the study followed several steps, including: (1) identify the learning problem of teachers` model (2) plan the learning steps (a way to solve the identified problem); (3) implement the learning done by the model teacher while the other teacher observing the learning process, (4) evaluate the learning process that has been done (5) improve the learning planning based on the results of the evaluation (6) re-implement the learning, (7) go after the implemented learning, and (8) share the experience and findings of the evaluation to other teachers. Activity sheets were used to gather the data. They are linked to mathematical understanding ability, attitude scale, and student journal. Referring to the results, they showed the the teachers learned triangle and pyramid triangle prism through the Lesson Study design got sightly improvement and a positive attitude.

Keywords : *Lesson Study design*, Prisma tegak segitiga dan limas, understanding, mathematics.

I. INTRODUCTION

One way to improve the quality of Indonesian human resources is to develop educational programs, in this case the improvement of communication as an educator in the field of mathematics.

Education is a human effort to make life better. Mathematics education substantially contains the development of thinking ability based on logical, critical, systematic, and accurate reasoning principles. With mathematics, we can practice logically, and with mathematics, other science can develop rapidly.

Teaching process in the classroom conducted by teachers whose basic ability is weak can be the cause of the low ability of students' mathematical thinking. If the teacher only acts as a transmitter of information, while the passive student listens and copies, once the teacher asks and the student answers, the teacher gives an example. So that happens mechanistic learning, meaningful learning is not expected to happen (Usdiyana et al, 2009). During this math learning is more exercise doing a lot of questions almost the same as the example, consequently the ability to think mathematically less developed students. This problem is a challenge that must be addressed and sought the solution how to make math learning more interesting and simple so as to attract student interest and provide opportunities for students to develop their abilities. Students tend to memorize mathematical concepts and often by repeating the definition given by the teacher or written in the book, without understanding the meaning and content.

As faced by mostly teachers, the majority still have base capability with low concept. It is due to their less creativity to innovate for better learning.

The previous explanation indicates that mathematics learning which can improve the ability of mathematical communication. Associated with the improvement of these capabilities, Sumarmo (2006) suggested that basic mathematical skills are expected to be possessed in five standards: (1) recognize, understand, and apply mathematical concepts, procedures, principles and ideas; (2) solve mathematical problem solving (mathematical problem solving); (3) mathematical reasoning; (4) make a mathematical connection (mathematical connection); and (5) mathematical communication.

Therefore, in learning mathematics students are expected to have good mathematical understanding skills. in order to get well-development for mathematical understanding ability, teachers need to improve their ability to understand the mathematical concept. Responding to that emerged problems, the authors are interested in conducting research related to the ability of mathematical understanding through Innovative Teaching Mathematics Lesson Study-based ".

II. LITERARY REVIEW

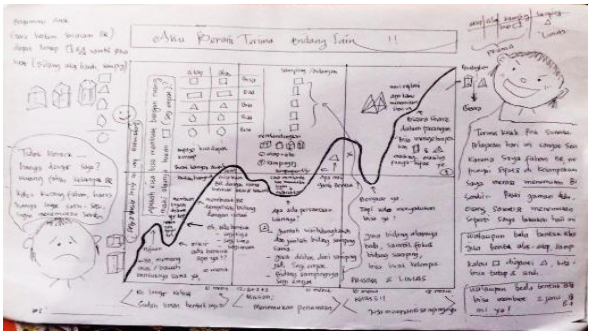
Lesson Study is a model of professional coaching through collaborative and sustainable learning learning based on the principles of collectivity and mutual learning to build a learning community.

Lesson Study covers 3 (three) activity steps, namely: planning stage, implementation of learning and observation (do) and reflection (see).

Stage 1: Planning

Problem identification (subject matter relevant to class and lesson schedule, student characteristics and classroom atmosphere, learning approaches / methods, media, props, and assessment) and alternative solutions.

1. Preparation of Research Theme
2. Preparation of learning tools consisting of:
3. Lesson Plans (RPP)
4. Student Activity Sheet (LKS)
5. Media and Display Tools
6. Instrument assessment process and learning outcomes
7. Learning Observation SheetSheet



Stage 2: Implementation and observation stage

In observing students, observers are advised:

1. Record students' comments or discussions and write down the student's name or position.
2. Make notes about situations when students cooperate or choose not to cooperate.
3. Looking for examples of the construction process of understanding through discussion and learning activities undertaken by students.
4. Record variations of individual problem solving methods by individual students or groups including incorrect resolution strategies.
5. Do students use their original knowledge or prior knowledge to understand new concepts learned?

6. Is the student's way of thinking facilitated and motivated by the questions asked by the teacher?
7. Are student ideas rewarded and associated with the material being studied?
8. Is the final conclusion based on student opinion?
9. Is the conclusion put forward according to the learning objectives?
10. Is there a strengthening of the students' competencies?

Stage 3 : Reflection

1. Teachers who carry out the learning activities express his impressions during the activities took place about himself and students.
2. Observers (other teachers and experts) presented the results of their observational data analysis, particularly those involving student activities during the learning activities that were accompanied by video playback of the recording of learning activities.
3. The teacher who performed the implementation provided feedback on the comments of the observers.
4. Revision of learning tools.
5. Understanding according to English-Indonesian Dictionary is a translation of comprehension. In the big Indonesian dictionary, understand has the meaning to understand right, know right. Sudjana (1996) suggests understanding of an operational nature of understanding is defined as seeing a relationship, understanding is defined as a tool using facts, and understanding is interpreted as seeing the use of something productively

according to Sumarno (1987), understanding is defined as the absorption of the meaning of material that is learned. Furthermore, Michener (Sumarno, 1987) stated that understanding is one aspect in Bloom`s taxonomy. To understand an object in depth, there are some terms needed to learn, likely : 1) the object; 2) its relation to other similar objects; 3) its relation to other unlike objects; 4) dual-relation with other similar objects; 5) relation with objects in other theories.

From the previous explanation, that is more specific cognitive process of understanding involves several processes, so the researchers took a few points of specific process to be used as indicators of understanding in this study.

III. RESEARCH METHOD

Data for this study were gathered through three instruments, including : communication ability test, rubrics, and attitude. The test utilized is in form of essays as it is more accurate in testing the highest level of students ability.

Capability test is beneficially for elaboration about the aspects of learning mathematics of students understanding. Mathematics understanding is more concerned on relational understanding, linking one concept to another ones.

IV. FINDINGS AND DISCUSSION

In the process of learning to construct basic shapes to the prism and observe the characteristics of that shape, so that each group is able to define its sense of the vertical prism. At the end section, students and teachers were tesed communication skills to measure their improvement. The test were analyzed by calculating the mean value and the result is 88.5.

The attitude scale used is : strongly agree (SS), agree (S), disagree (TS), and strongly disagree (STS). Statement posed on attitude scale includes : positive sentences (85 %), and negative sentences (15%). It is seen that most students (81.31%) agree with positive statements in

questionnaire and 18.69% students disagree with negative statements.

The students motivation is not used to improve before the lesson study-based mathematic learning has been implemented.

V. CONCLUSION

The following is summary of study result in implementing lesson study-based mathematical learning in prism shape :

1. There is an improvement towards the mathematical understanding ability through lesson study-based mathematic learning
2. There is a possitive attitude from students and teachers in implementation of lesson study-based mathematic learning

   From students daily journal, it is revealed that students is more attractive in following the mathematic learning. Therefore, the concepts is easy delivered.

Turning to suggestions and recommendation for further researchers, it is as following :

1. To attract students attention in following the activity, it is better to have attractive, interactive and relevant additional media.
2. To get students active in class and to foster the students mathemactical concept, lesson study-based mathematic learning tend to be one of alternative ways.
3. For further researcher, the study towards lesson study-based mathematic learning is recommended to conduct in another context.

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