IMPLEMENTATION OF LESSON STUDY IN LEARNING SETS THROUGH THE INTERACTION OF LIVING THINGS WITH THE ENVIRONMENT

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Abstract

The purpose of this activity is to observe the learning process in relation between learning materials, students and teachers interaction and interactions among students in learning through the implementation of lesson study. In general, this activity is a collaboration among the University of Muhammadiyah Semarang, the Regional Leadership of Muhammadiyah Central Java and all Muhammadiyah schools in Central Java from July to September 2021. In particular, this activity was held at Muhammadiyah Plus Junior High School Salatiga in August 2021. Lesson study based on The school was participated by mathematics and science teachers at Muhammadiyah Plus Junior High School Salatiga based on the following stages: (1) planning (plan), (2) implementation (do), and (3) reflection (see). Mathematics and science teachers carry out lesson plans by making chapter designs and lesson designs. The implementation of lesson study at Muhammadiyah Plus Junior High School Salatiga based on integrated learning which applied in group learning through the interaction of living things with the environment. Furthermore, there is a reflection towards implementation stages and find to solve the problem happened so that the next learning can be carried out properly.

Keywords: Sets, Interaction, Lesson Study, Living Things

1. PRELIMINARY

The COVID-19 pandemic has brought about many changes in the world of education. One of them is the development of the ability to use teacher technology to carry out the teaching and learning process for students. Training, seminars, and various activities are followed by teachers to develop their competencies in order to achieve good quality of learning process in all situations. Teachers should be master four teacher competencies, they are pedagogic competence, personality competence, professional competence, and social competence according to Permendiknas No 16 2007. These competencies support teachers as learning agents who play important as facilitators, creator of learning system, and give inspiration for students to create fun and quality learning. As learning agent, a teacher should keep learning and develop the competencies so that he/she can be a quality teacher. One of supporting activities is by joining in a lesson study which is held by University of Muhammadiyah Semarang in collaboration with PWM Central Java and all Muhammadiyah school in Central Java.

Garfield (in Setyaningsih, Lely; 2018), lesson study comes from Japan (jugyokenkyu) which is a systematic process used by Japanese teachers examine the effectiveness of their teaching in order to improve learning achievement. Lesson study is one of the models for fostering teachers through the assessment of learning activities that are carried out collaboratively and sustainably in building a learning community. Lesson study is able to improve teacher competence and liveliness students in learning process.
Abdurrahman (in Sari, Suryaning, et al; 2017), mathematics is a practical symbolic language to express quantitative and spatial relationships, while its theoretical function is to facilitate thinking. Mathematics is often considered by students as difficult and boring lesson. This can be seen in the activity of students and the interaction of students and teachers as well as between students during the learning process. One of ways to create a quality and fun learning is by doing collaboration among teachers through lesson study activity.

Based on these matter, the author thinks that it is necessary to improve learning process for students. It is done in order the students can learn in pleasant atmosphere and increase liveliness of the students in learning process. In addition, it needs a learning model that can create pleasant situation, to eliminate boredom and absorb all materials by all the students. Integrated learning is mixture learning, in this case the author combines 2 subjects, namely mathematics and science in "learning sets through the interaction of living things with the environment”.

2. METHOD

The implementation of lesson study is different from a country to another countries. This is adjusted to the problems faced by educators or educational problems faced by a country. So there is a modification of the stages of lesson study. Bill Cerbin and Bryan Kopp (in Subadi, Tjipto: 2010) state that there are six stages in lesson study, namely (1) form a team; (2) develop student learning goals; (3) plan the research lesson; (4) gather evidence of student learning; (5) analyze evidence of learning; (6) repeat the process.

Tjipto Subadi (2010) suggested four stages of lesson study as an effective teacher development model, namely: (1) conducting academic studies, especially analyzing learning problems, both from the aspect of the SK syllabus, KD, indicators, learning objectives, development of teaching materials, development of the use of multiple methods and multi-media as well as the development of evaluation tools; (2) find solutions and make plans in the form of RMP (Learning Quality Plan) centered on student activities; (3) the implementation of learning in the classroom, the teacher as an observer; (4) post-learning discussion to reflect on it.

This activity includes 3 stages, namely (1) planning (plan); (2) implementation (do); and reflection (see) and lasted for 2 cycles. The subjects of the lesson study activities are seventh grade students of Muhammadiyah Plus Junior High School Salatiga in 2021/2022 academic year. The stages of activities are described in Figure 1. The data obtained in the lesson study activities are the results of observations of learning activities in each cycle and documentation.

![Figure 1. Lesson Study Stages](image-url)

3. RESULTS AND DISCUSSION

According to Putra (2010) in Sucilestari and Arizona (2019), lesson study is supported by three stages of activities, namely planning (plan), implementation (do), and reflection (see). Based on this, the mathematics and science teacher at Muhammadiyah Plus Junior High School Salatiga carried out lesson study based on these stages. Mathematics and science teachers carry out learning plans in the form of making chapter
designs and lesson designs. The implementation of (do) lesson study at Muhammadiyah Plus Junior High School Salatiga in integrated learning is applied in group learning through the interaction of living things with the environment. Furthermore, there is a reflection on the implementation stages and finding solutions to problems that arise so that the next learning can be done out properly. The activities are described in four meetings as shown in the following table.

Table 1. Four Lesson Study Activities

<table>
<thead>
<tr>
<th>the meeting</th>
<th>Date</th>
<th>The place</th>
<th>Activity (Plan-Do-See)</th>
<th>Material</th>
<th>Teacher Name</th>
<th>Model</th>
<th>Number of teachers present</th>
<th>Activity Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>August, 2, 2021</td>
<td>Muhammadiyah Plus Junior High School Salatiga</td>
<td>plan 1</td>
<td>set</td>
<td>Suryaning</td>
<td>Fajar Sari</td>
<td>4</td>
<td>established good interaction among students and between students and teachers</td>
</tr>
<tr>
<td>2</td>
<td>August, 13, 2021</td>
<td>Muhammadiyah Plus Junior High School Salatiga</td>
<td>do-see 1</td>
<td>Learning groups through the interaction of living things with the environment</td>
<td>Suryaning</td>
<td>Fajar Sari</td>
<td>4</td>
<td>established good interaction among students and between students and teachers</td>
</tr>
<tr>
<td>3</td>
<td>August, 16, 2021</td>
<td>Muhammadiyah Plus Junior High School Salatiga</td>
<td>plan 2</td>
<td>Empty set, universal set, subset,</td>
<td>Suryaning</td>
<td>Fajar Sari</td>
<td>4</td>
<td>established good interaction among students and between students and teachers</td>
</tr>
<tr>
<td>4</td>
<td>August, 27, 2021</td>
<td>Muhammadiyah Plus Junior High School Salatiga</td>
<td>do-see 2</td>
<td>Learning sets through the interaction of living things with the environment</td>
<td>Suryaning</td>
<td>Fajar Sari</td>
<td>4</td>
<td>established good interaction among students and between students and teachers</td>
</tr>
</tbody>
</table>
Plan-do-see activity 1

![Figure 2. Chapter design-plan 1](image-url)
Findings by the observer (from direct observation) during the implementation of do-plan 1:
1. The division of groups is heterogeneous, both in terms of ability and gender.
2. When dividing groups through breakout zoom, some students still feel confused because it is first time for them use the method.
3. In general, students who was less active in learning process become active during do-see 1 activities.
4. During the discussion, the collaboration among the students in finding the concept of the set was quite good.
5. There are some students who can’t express their opinion and findings.
6. The thinking process of some students has led to the concept of a set.
7. Some students are able to differentiate groups belongs to set and non-set.
8. Some students are able to present the results of the discussion well.
9. The finding of students is appropriate with teacher designed arrangement.

Follow-up activities on the see-1 evaluation activity:
1. For students who are not familiar with breakout zoom, the solution is to give more detailed explanation about grouping technique.
2. Before learning process, the teacher prepares all the possibilities that can occur during learning activities.

Plan-do-see activity 2
Chosen the material in this activity is the set material about empty sets, subsets and universe sets. In the planning activity (plan), there are four teachers make a chapter design and lesson design shown in Figure 4.
**Figure 4. Chapter design-plan 2**

**Figure 5. Lesson design-plan 2**
Findings by the observer (from direct observation) during the implementation of do-plan learning 2
1. The division of the group through the zoom breakout went well.
2. All students are involved in group discussions.
3. Students are active in the discussion, if there are questions, the students are communicated with the teachers directly.
4. The thinking process of students in finding the concept of empty set, universal sets and subset run well.
5. Some students are able to present the results of group discussions in their own language and the teacher becomes a good facilitator and motivates other students to listen and respond.
6. There is interaction among the students when they responses to other group presentation.
1. Follow-up activity in the “see-plan 2” evaluation activity is the teachers must know and understand that every student has different utterances with the teachers but has similar meanings.

4. CONCLUSIONS AND SUGGESTIONS
Conclusions
The implementation of lesson study in group learning through the interaction of living things with the environment for class VII students of Muhammadiyah Plus Junior High School Salatiga runs well. The teachers get a lot of valuable lesson to increase their competence in teaching learning process. Through this activity, teachers know and learn about chapter design and lesson design, teachers with different subjects can collaborate to produce integrated learning in the classroom, to increase competences furthermore the teachers can develop their abilities in using technology in teaching learning process. On the other side, the teacher also can learn how to be a good and critical observers so that quality of reflection and follow-up to be increased.

Suggestions
This lesson study activity is expected to be held continuely so that create a better of learning quality.

5. REFERENCES