LEARNING REFLECTION ON BASIC MATHEMATICAL SUBJECT IN HIGHER EDUCATION AS THE FINAL STAGE OF LESSON STUDY IMPLEMENTATION

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Abstract

Students often have math anxiety which results in low learning outcomes. Giving story questions turned out to raise student's difficulties in solving problems, including identifying elements that are known, asked, and adequacy of elements, and making mathematical models of story problems. This indicates that the problem-solving ability of non-mathematics major students in basic mathematics courses is low. Lesson Study Learning based on character education can facilitate the acquisition of solutions to the above problems. The most important stages in lesson study are stages of reflection (see), in which the stages are stated all findings in learning are then given input in order to improve learning. This study uses the descriptive method with a qualitative approach. The activity carried out is to describe the reflection of basic mathematics learning as the final stage of the lesson study implementation. The research variable is in the form of a dependent variable, such as students' problem solving abilities and independent variables, namely student activity and creativity. It was obtained an average problem solving ability of 81.52. While the students' activeness with an average of 83.4 categories is very active and the average of students' creativity is 81.3 with a very good category. The character building for students, such as honesty, discipline, creativity, curiosity, enthusiasm, responsibility, tolerance, hard work, democratic, friendly / communicative, independent, religious, caring for the environment, and socially concerned. Hopefully, further research can be carried out to improve abilities understanding's student concepts in basic mathematics subjects.

Keywords: lesson study, reflection, basic mathematics

Introduction

Mathematics is a very avoided subject for the majority of students from various levels of education. Mathematical anxiety arises in students who tend to avoid mathematics. Some of the factors that cause mathematics anxiety include unfavorable classroom conditions, weak teacher ability to deliver materials, mathematics also has many formulas, students cannot solve problems (Anditya, 2016). Students cannot solve mathematical problems in daily life is one indicator of a lack of problem solving skills. A common condition in the world of education is learning that still uses traditional learning methods, such as lectures (conventional), expository, or drill that are often applied before the exam.

Basic mathematics is one of the basic courses taken by non-mathematics students to support compulsory subjects that require mathematical calculations. The results of interviews with basic mathematics lecturers in non-mathematics majors resulted in the fact that students often have mathematical anxiety which results in low learning outcomes. The supply of story problems turns out to cause difficulties for students in solving problems, including identifying elements, questions, and adequacy of elements, and make mathematical models of story problems. These problems are indicators of problem solving ability (Sumarmo, 2012), which means that problem solving abilities of students in non-mathematics majors in basic mathematics courses are low. The results of learning mathematics, one of which is influenced by problem solving abilities (Novitasari and Leonard, 2017). Understanding the concept raises the lack of activity of students in expressing opinions, student creativity asks, and completes the questions given. This is what underlies the lack of students' character values.

Lesson Study Learning based on the character education can facilitate the acquisition of solutions to the above problems. The implementation of collaborative activities, Lewis (2002) and Hendayana cited by Rustono (2008) mentions there are three stages of learning in lesson study, namely planning (plan), implementing (do), and reflecting (see). Various things related to

character designed and implemented in learning basic mathematics courses. This begins with cognitive value recognition, affective value appreciation, finally to actual practice of values by students / students in daily life (Elfindir, et al, 2012). Lesson learning can improve students' problem solving skills compared to the use of conventional learning models (Jurniati, 2009). The learning study that is carried out is a series of learning activities with a character education approach to improve learning so that goals are achieved. The most important stage in lesson study is the stage of reflection (see), wherein at that stage all the findings of learning are presented to be given input in order to improve learning.

The problem becomes the background of the purpose of this study, which is to describe the reflection of basic mathematics learning as the final stage of the implementation of lesson study.

Method

This study used the descriptive method with a qualitative approach. Descriptive method is a method used to look for elements, characteristics, characteristics of a phenomenon. This method starts with collecting data, analyzing data and interpreting it (Suryana, 2010). While the qualitative approach is an approach which in the research proposal, process, hypothesis, take to the field, analyze the data and conclude the data up to the writing using trends, non numerical calculations, descriptive situational, in-depth interviews, and content analysis.

The activity carried out was to describe the reflection of basic mathematics learning as the final stage of the implementation of lesson study. The research variables were in the form of dependent variables, such as; students' problem solving abilities and independent variables, namely student activity and creativity. The data collection used observation, questionnaires, and evaluation tests. Observation technique is a complex process, a process that must be composed of various psychological and biological processes (Sugiyono, 2011). Observation techniques are carried out during the learning process with the main focus is the activity of students in the learning process and problem solving. The questionnaire is a technique of data collection conducted by giving a set of questions or written statements to the respondent to answer them (Sugiyono, 2011). Researchers measured students' creativity in the implementation of learning. While tests were used to measure students' problem solving abilities in achieving learning goals.

Lesson learning was carried out on non-mathematical study programs in basic mathematics courses with problem based learning (PBL) learning methods that were carried out in four stages with different material at each stage. The material in stage 1 was a positive rounded number, the material in stage 2 was the properties of root shape numbers, stage 3 was given the material of root shape algebraic operations, while stage 4 with the material rationalized the denominator of the shape of the root.

The students' activeness in learning is observed and measured by the learning activeness sheets.

Table 1. The Students' Activeness Criteria

$0\% \leq y < 20\%$	Very passive
$20\% \leq y < 40\%$	passive
$40\% \leq y < 60\%$	Quite active
$60\% \leq y < 80\%$	Active
$80\% \leq y \leq 100\%$	Very active

Note : y = students' percentage

The amount of students' creativity can be measured by indicators and scoring learning creativity.

Table 2. Students' Creativity Criteria

Coefficient	Interpretation
81% - 100%	Very good
61% - 80%	Good
41% - 60%	Quite
21% - 40%	less
0 % - 20%	Very little

3.Results

Research Result

Lesson learning reflection is given based on findings during learning activities. The findings and reflections can be seen in table 3 below.

Table 3. Findings and Reflection phase 1

No.	Findings	Reflections Results
1.	Students have no difficulty in doing LKM and can do it quickly and precisely.	There are no significant problems.

2.	Students don't ask much about the material and questions given.	There needs to be an interaction that begins with the lecturer or questions that can provoke students so that they can bring students active in asking questions.
3.	In doing observations, observers are still behind the class.	This can disturb the concentration of lecturers in teaching. Observers should be able to observe the learning process on the side of the class.

The character values that appear in stage 1, consists of honest, disciplined, creative, uplifting, responsibility, hard work, democratic, and independent. The lesson study learning process phase 1 was closed with an evaluation test with an average problem solving ability of 80.5. Referring to the results of reflection phase 1, in this stage 2 learning the lecturer further increased interaction with students and observers observed the learning in addition to the class. The findings and reflection of stage 2 can be seen in table 4 below.

Table 4. Findings and Reflection Phase 2

No.	Findings	Reflections Result
1.	Students discuss the materials and there are still some groups that don't understand.	When the discussion activities, the lecturer must surround the class by looking at and asking about the difficulties of each group. Especially for groups whose group members tend to be quiet.
2.	There are two students who ask about the problems given.	The lecturer can explain it in front of the class so that all the students know information about the problems given. The hope is that other students can also ask so there is reciprocity and feedback in the class.
3.	There are some students who do not pay attention to the lecturer when explaining.	There are several factors that cause students not to pay attention. These factors include a learning model that must be changed because it is less pleasant or a factor of the student itself. In the future, maybe the learning model can be varied with games or other fun things.
4.	There are 3 groups that are not discussing because one of the members seems lazy to work on the MFI and assigns the task to other group members.	In this case the lecturer must act decisively, especially for students who submit their assignments to other groups. The lazy student can be appointed to present the results of the discussion with the group.

The character values that appear in stage 2, which are honest, disciplined, creative, curiosity, hard work, and independent. As in stage 1, stage 2 learning ended with an evaluation test with an average problem solving ability of 81.2.
The results of reflection stage 2 were applied in stage 3 to improve learning, including lecturers pointing to students who seemed lazy to present it in front of the class. The findings and reflections in step 3 can be seen in the following table.

Table 5. Findings and Reflections Phase 3

No.	Findings	Reflections Results
1.	Students experience difficulties when given the problem of root shape addition operations. For example when given a question $\sqrt{2}+\sqrt{3}$, many still answer with $\sqrt{6}$. While the answer should be $\sqrt{2}+\sqrt{3}$.	This shows a lack of understanding of the material concept of root-form algebraic operations. Material deepening is needed to bridge the problem. In the learning process, lecturers can provide material before giving problems to be discussed.
2.	There is a tendency to copy answers from other groups	
3.	There are 3 groups whose answers are all wrong	
4.	Lack of collaboration in groups	

The character values that appear in stage 3 consists of creative, curiosity, enthusiasm, responsibility, tolerance, hard work, and democratic. Stage 3 learning ended with an evaluation test with an average problem solving ability of 80.75. The results of the reflection in stage 3, namely the deepening of the material was implemented in stage 4, before the implementation of PBL learning with a character education approach, given an explanation of the material rationalizing the root form denominator by the lecturer. The findings and reflections in stage 4 can be seen in the following table.

Table 6. Findings and Reflections phase 4

No.	Findings	Reflection Results
1.	Students begin to understand the concept of root form and problem solving.	Improved learning occurs that can foster activeness, creativity, and problem-solving abilities to increase.
2.	Students are more creative in asking questions and discussing solving problems because they have received an explanation beforehand.	
3.	Students are more active in expressing opinions during the learning process.	

The character values that appear in stage 4, consists of honesty, discipline, creativity, curiosity, enthusiasm, responsibility, tolerance, hard work, democratic, friendly / communicative, and independent. Stage 4 learning ended with an evaluation test with an average score of problem solving ability of 83.63. The average student activeness and creativity of the four stages, namely the activity of students with an average of 83.4 categories is very active while the average creativity of students is 81.3 with a very good category.

Discussion

The results showed an improvement in learning which resulted in the development of creativity and activeness of students, as well as an increase in students' problem solving skills after the implementation of lesson study as shown in the following table.

Table 7. The results of the average problem solving ability

Problem solving ability	Phase 1	Phase 2	Phase 3	Phase 4
Score	80.5	81.2	80.75	83.63
Average score	81.52			

The table shows a significant increase in the average problem solving ability in stage 4. This is because the improvement of learning carried out from the results of reflection on the learning process stage 3 where the average value of problem solving ability had decreased. The decrease was caused by the understanding of students' concepts in low root form algebraic operating material. In accordance with Mustofa's research, et al (2016) which states that lesson study based learning can improve student problem solving skills. Lesson learning can also foster student activity and creativity. The results of student activity and creativity analysis can be seen in the following figure.

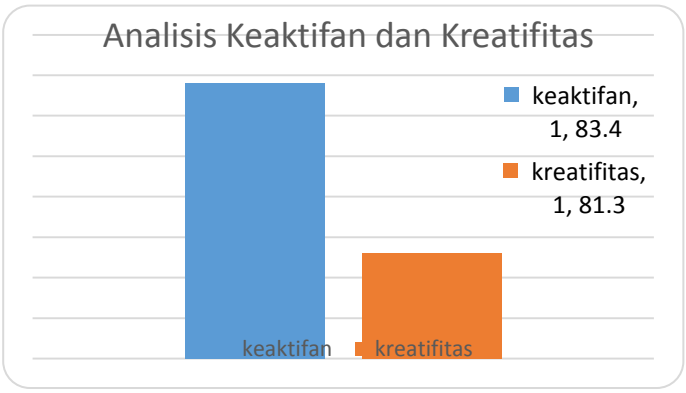

Figure 1. The results of student activity and creativity analysis

The character education approach implemented in learning can bring up student character values, including honesty, discipline, creativity, curiosity, enthusiasm, responsibility, tolerance, hard work, democratic, friendly / communicative, and independent. However, the value of the dominating character is creative and hard work, because solving problems requires students' creativity and hard work.

4. Conclusion And Suggestion

Conclusion

The results of the study provide the following conclusions:

1. It was obtained problem solving ability average 81.52. While the students' activeness got 83.4 and the categories is very active. Besides, the students' creativity is 81.3 with a very good category
2. Implementing character on students which consists of honesty, discipline, creativity, curiosity, enthusiasm, responsibility, tolerance, hard work, democratic, friendly / communicative, independent, religious, caring for the environment, and social caring.

Suggestion

Further research can be done to improve students' ability to understand concepts in basic mathematics courses.

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