THE EFFECTIVENESS OF MODEL ELICITING ACTIVITIES TOWARD MATHEMATICS LEARNING OUTCOMES

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ABSTRACT

Learning based on the group after the students were given Worksheets Students, the teacher will provide problems then described and carried out by teachers in front of the class. It makes the students working on the issue by way of the teacher to face a new problem of students having difficulty in the settlement. The learning model is required that can enhance student learning outcomes by using Model Eliciting Activities. This research aims to know the effectiveness of Model Eliciting Activities against the learning outcomes of students of grade VIII Junior High School (SMP) Muhammadiyah Boarding School (MBS) Prambanan even semester academic year 2017/2018. This research using quantitative research methods. The population used is grade VIII SMP MBS academic year of 2017/2018. The sample used, i.e., class VIII E and VIII F. Data collection techniques used is the test. The instrument used was a pretest and posttest. The data analysis technique used is a prerequisite test analysis and hypothesis testing. The results of research on a significant level of 5% and degrees of freedom = 63 shows; (1) there is a difference in learning outcomes of students using Model Eliciting Activities (MEAs) with learning outcomes of students who use conventional learning model class VIII even semester of SMP MBS Prambanan academic year of 2017/2018. (2) Model Eliciting Activities (MEAs) is more effective than the conventional model against learning outcomes of students of grade VIII, even semester of SMP MBS Prambanan academic year of 2017/2018.

Key Words: Effectiveness, Model Eliciting Activities, Mathematics Learning Outcomes

INTRODUCTION

Education is a very fundamental need, where every individual needs the education to improve knowledge and skills. Understanding education generally concerns the learning process in a short time with methods that prioritize practice rather than theories that help shape individuals to have a spiritual attitude, social attitude, knowledge, and skills. Education is an effort to build and improve Human Resources (HR) quality towards an era of globalization full of challenges. Education that has a good quality will give birth to HR who can compete in the era of globalization. Education according to the Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System, namely: A conscious and planned effort to create an atmosphere of learning and learning process so that students actively develop their potential to have spiritual, religious, self-control, personality, intelligence, noble morals, and the skills needed by himself, society, nation, and state.

Mathematics is a subject that is studied from elementary to tertiary level. Mathematics is a science field with unique characteristics because there are abstract symbols and concepts (Widiyasari, 2013: 487). Therefore according to Amalia, Duskri, & Ahmad (2015: 38), mathematics is a lesson that trains students to think critically, logically, and creatively. Permendiknas No.21 2016 explains the content of mathematics lessons, namely Having a sense of trust in the power and usefulness of mathematics, formed through learning experiences, and Having the ability to communicate mathematical ideas. The content of mathematics is very important in students' learning process because, in mathematics, students must solve problems by linking mathematical concepts in various topics or everyday situations or bringing up students' ability to reason and communicate.

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mathematical ideas in various topics or everyday situations or bringing up students' ability to reason and communicate. Then they solve the questions together led by the teacher, again taking notes. Students in completing exercises lack confidence, so that students feel less confident in completing their exercises, which results in poor student learning outcomes. Students in learning often ask questions about using mathematics in everyday life because they do not know mathematics. After all. During the learning process, the teacher does not mention examples of the material's usefulness in real life. Students are less actively involved in learning mathematics, so they look passive in the learning process. Model Eliciting Activities (MEAs) is a learning model that seeks to get students actively involved in the process of learning mathematics in class (Amalia, Duskri, & Ahmad, 2015: 40). According to Zulkarnaen (2015: 34), students are given problems in daily life, so students can solve them through model construction, so Model Eliciting Activities (MEAs) encourage students to create and test mathematical models. Difference Model Eliciting Activities (MEAs) with other learning models presented a real problem in everyday life in the form of an article later from the problem. Students find mathematical concepts.

Based on the background of the problem described above, the formulation of the problem that will be examined in this study are as follows: (1) Is there a difference in students' mathematics learning outcomes using the Model Eliciting Activities (MEAs) with student mathematics learning outcomes using conventional learning models in the eighth-grade students of SMP MBS Prambanan even semester of the academic year 2017/2018? (2) Is the Model Eliciting Activities (MEAs) more effective than conventional model learning towards the mathematics learning outcomes of students of class VIII at SMP MBS Prambanan in the even semester of the academic year 2017/2018 ?.

The objectives of this study are as follows: (1) To find out whether there are differences in mathematics learning outcomes of students who use the Model Eliciting Activities (MEAs) with mathematics learning outcomes of students who use conventional learning models in class VIII students of SMP MBS Prambanan in the even semester of the year 2017/2018 teachings; (2) To find out whether the Model Eliciting Activities (MEAs) is more effective than the conventional model of learning towards the mathematics learning outcomes of students of class VIII of SMP MBS Prambanan in the even semester of the academic year 2017/2018.

According to Hamidah, Rosidin, & Abdurrahman (2013: 130) that the MEAs learning model is learning based on the real-life of students, working in small groups, and the solution is to present a mathematical model. Exciting Activities Model (MEAs), according to Zulkarnaen (2015: 34), is an activity to build a model, which is a mathematical model. So it can be concluded that the Model Eliciting Activities (MEAs) is learning that presents real problems in everyday life that students work through small groups to find solutions in mathematical models. Suningsih (2015: 33) mentions the learning steps of the Model Eliciting Activities (MEAs) as follows: (1) The teacher reads a context of a problem that is similar to an article in a newspaper; (2) students respond by preparing questions to be given based on the problem being read; (3) the teacher reads the question/problem and makes sure each group understands what is asked; (4) students try to solve the problems provided by using images, data, etc. as students' information providers in constructing mathematical models; (5) students report the results in writing and present them.

According to Sudjana, N (2013: 22), learning outcomes are students' abilities after learning. Howard Kingsley divides three types of learning outcomes, namely (1) skills and habits, (2) knowledge and understanding, (3) attitudes and ideals. At the same time, Gagne divides the five categories of learning outcomes, namely (1) verbal information, (2) intellectual skills, (3) cognitive strategies, (4) attitudes, (5) motor skills. In the national education system, the formulation of educational goals, both curricular and instructional objectives, uses the classification of learning outcomes from Benjamin Bloom, which broadly divides them into cognitive, affective, and psychomotor domains. Learning mathematics results are the results of a student after following the teaching and learning of mathematics as measured by these students' ability to solve a mathematical problem (Muhammad, Salam & Hasnawati 2016: 103).

METHODS

This type of research is experimental research. Research design is all the processes required to plan and conduct research (Sukardi, 2016: 183). The research design was made to provide a clear picture of the activities carried out during the research process. The design in this study uses two classes, namely experimental class 1 and experimental class 2. Design the research plan for experiments as follows:

Experiment class 1: Y_1 X Y_2

Experiment class 2: Y_1 - Y_2

Y_1: the initial ability of the experimental class 1 and experimental class 2

Y_2: learning outcomes of experimental class 1 and experimental class 2

X: Treatment using Model Eliciting Activities (MEAs).

-: there is no treatment Model Eliciting Activities (MEAs) or get a conventional learning model treatment.

The place used for research is at SMP MBS Prambanan in class VIII, even semester of Academic Year 2017/2018. The research time used for data collection was from March 26 to April 2, 2018. This study's population was students of class VIII in the even semester of SMP MBS Prambanan Academic Year 2017/2018, which consisted of 10 classes. After drawing the population consisting of 10 classes, two experimental classes were obtained, class VIII E as an experimental class 1 with 32 students and class VIII F as an experimental class 2 with 33 students.

In this study, the test method for data collection techniques was used. In this study, data collection procedures are as follows: (1) determine the research object, namely eighth-grade students of SMP MBS Prambanan; (2) taking a research sample, namely the experimental class 1 and the experimental class 2. Then determine the test class outside the research sample, but be in the study population; (3) conducting preliminary ability tests on students of class VIII of SMP MBS Prambanan in experimental class 1 and experimental class 2 as preliminary data; (4) analyzing data by conducting normality and homogeneity tests; (5) compile a trial lattice test; (6) compile trial test instruments based on existing grids; (7) testing the test instrument of the trial class which will be used as the final test; (8) analyzing data from trial results to find out the validity and reliability; (9) determine the questions that meet the requirements based on point (8); (10) preparing plans for implementing the Learning Model Activities in experimental class 1 and conventional learning in experimental class 2; (11) the researcher applies the implementation plan of the Eliciting Activities learning model in the experimental class 1 and the conventional learning model in the experimental class 2; (12) conducting a final test to find out students' mathematics learning outcomes; (13) analyzing test result data; (15) compile the results of research.

The steps undertaken in this study are as follows: (1) determine the population, namely all students of class VIII SMP MBS Prambanan Academic Year 2017/2018; (2) determine the sample by selecting two classes from the population; (3) pretesting the experimental class 1 and experimental class 2. This test aims to find out how the students' initial abilities are given treatment. The data is tested for normality and homogeneity. After being analyzed, it was found that there were no significant differences in the rank of students' initial abilities in the experimental class 1 and the experimental class 2; (4) giving treatment to experimental class 1 and experimental class 2; (5) providing posttests in experimental class 1 and experimental class 2. This test aims to determine student learning outcomes after being given treatment; (6) conducting data analysis; (7) make conclusions.

RESULTS AND DISCUSSION

The provision of the pretest is used to determine the students' initial abilities before being given the treatment of the experimental class 1 and the experimental class 2. Table 1 represents the posttest results of the experimental class 1 and the experimental class 2.

Table 1. The initial abilities of the experimental class 1 and experiment 2 students

Class	Min Value	Max Value	$\bar{x}$	S	S^2
Experiment 1	23	0	10,9	5,9	34,4
Experiment 2	17	0	7,8	4,5	20,1

The above pretest results were used to determine whether the class used in the study is a homogeneous class or not and determine whether the sample class is usually distributed.

Table 2. Summary of normality tests for students' initial abilities

Class	χ^2_{count}	χ^2_{table}	Significant Level	Df	Info.
Experiment 1	1.1841	7.8147	5%	3	Normal
Experiment 2	1.8289	7.8147	5%	3	Normal

The normality test analysis results show that $\chi^2_{count} < \chi^2_{table}$, which means the data is usually distributed. Table 2 shows that the initial ability scores of experimental class 1 and experimental class 2 are normally distributed.

Table 3. Summary of homogeneity tests of students' initial ability scores

χ^2_{count}	χ^2_{table}	Significant Level	Df	Info.
2.2440	3.8415	5%	1	Homogeneous

The results of the normality test show that $\chi^2_{\text{count}} < \chi^2_{\text{table}}$, which means the data is homogeneous. The data Table 3 shows that the initial ability scores of students are homogeneous. Then given treatment in the experimental class 1 and experimental class 2, after being given treatment in each class, then given a posttest in the experimental class 1 and experimental class 2 to determine student mathematics learning outcomes as in Table 4.

Table 4. Grades of student mathematics learning outcomes

Class	Min Value	Max Value	$\bar{x}$	S	S^2
Experiment 1	80	0	49,1	21,3	454,9
Experiment 2	53	0	28,2	16,7	280,0

After the posttest is done, the next is one-party hypothesis testing and two-party hypothesis testing as in Table 5.

Table 5. The results of the two-party test results of student mathematics learning

t_{count}	t_{table}	Taraf Signifikan	df	Info.
4,39905	1,99928	5%	63	H_0 rejected

Based on the two-party hypothesis test results, $t_{count} > t_{table}$ is at a significant level of 5% and a degree of freedom 63, which means H_0 is rejected. This means that there are differences in students who use the Model Eliciting Activities (MEAs) with mathematics learning outcomes of students using conventional learning models class VIII, even semester of SMP MBS Prambanan, even semester of 2017/2018 school year.

Table 6. Results of one-party hypothesis test results of student mathematics learning

t_{count}	t_{table}	Taraf Significant	df	Info.
4,39905	1,66996	5%	63	H_0 rejected

Based on one-party hypothesis testing results in Table 6, $t_{count} > t_{table}$ is at a significant level of 5% and a degree of freedom 63, which means H0 is rejected. This means that the Model Eliciting Activities (MEAs) is more effective than the conventional model of mathematics learning outcomes for students of class VIII in the even semester of SMP MBS Prambanan in the even semester of the academic year 2017/2018.

The factor that makes the experimental class more effective than the experimental class 2 is the experimental class 1 learning using MEAs. Students learn more independently to understand the lesson, with students' self-understanding longer remembering a concept because they find the mathematical model themselves. Students in MEAs are also more motivated because each student will be more active in discussions. After all, the teacher randomly appoints students to present the results of group discussions. While in experimental class 2 learning using the conventional model, students are only less motivated because during presentations, the teacher appoints one group to present the results of group discussions, where there are students who are inactive and dependent on other group members.

Model Eliciting Activities (MEAs) whose learning is based on real-life students and working in small groups, and the solution in the form of a mathematical model (Hamidah et al. 2013: 130) is proven to improve student learning outcomes, and this is indicated by an increase in student mathematics learning outcomes on students who use the Model Eliciting Activities rather than students who use conventional learning on the subject of surface area and volume of prism and pyramid class VIII even semester of SMP MBS Prambanan Academic Year 2017/2018.

CONCLUSION

Based on the results of the research conducted, it can be concluded that (1) There are differences in mathematics learning outcomes of students who use the Model Eliciting Activities (MEAs) with mathematics learning outcomes of students who use conventional learning models in class VIII, even semester of SMP MBS Prambanan even semester of the school year 2017/2018; (2) The Model Eliciting Activities (MEAs) is more effective than the conventional model of mathematics learning outcomes for students of class VIII in the even semester of SMP MBS Pramabanan even semester of the academic year 2017/2018.

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