The Results of Using the Zoom Application on Mathematical Representation Ability of Junior High School Students

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Abstract. This study is a study to determine the results of the analysis of problem posing models assisted by the Zoom application for junior high school students in Bengkulu, the sample taken was 64 students of which there were 2 classes with 32 students each. This study used the Anacova test.

Keywords: zoom application · mathematical representation ability · junior high school students

1 Introduction

Mathematics is a basic science that must be understood by students, because these lessons have a lot to do with everyday life, as well as the development of the times [1]. There are many ways to understand mathematics, for example with learning models. With the learning model, there are many ways to get the desired results. Students assumeifthe lesson isTheoryscary and difficultthen it must be givenassumptionthatthe lesson is easy. Because, the assumption in a lesson has an impact on the quality of student learning outcomes. Whereasmath learningabstract shapedemanding studentscan rely on communication skills to solve existing problems. The learning is understood through mathematical representation and communication and is appreciated using mathematical problems.

According to the survey resultsdiscussionwith the teacher who teachesat S school M middle First State 16 Bengkulu related to the implementation of mathematics learning in distance learning. During the learning process, it was found that there were obstacles related to learning outcomes, namely that few students participated in solving problems, it was difficult to understand if the explanation with practice was slightly different from what was explained. According to the learning outcomes, there are not a few students who have not finished, with the standard being 70. Thus, the learning objectives have not been achieved as desired. Not at least students who get low scores because students are not accustomed to participating in the learning process such as asking and giving their own opinion if the material provided does not understand. During the learning process in learning, students are less active, namely students rarely give opinions, and ask questions

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about the material presented. When the learning process only occurs in one direction, the teacher does not provide stimulation to students to express their opinions, even though it is done face-to-face.

Learning objectives will be achieved if the learning process is carried out reciprocally, where students ask if there are difficulties so that problem solving and communication in mathematics lessons go well, while at the school the lack of representation and communication of mathematics is due to the learning process without reciprocity, where the teacher only give material without explaining the details and students do not ask questions, because the process of representation and communication in mathematics learning does not occur reciprocally, student activity is less. Lack of active students due to lack of mathematical representation and communication, namely students rarely ask and give opinions, they only listen to what the teacher says so that mathematical representation and communication is very lacking.

Understanding mathematics learning can be done with mathematical representation and communication skills and is given by the teacher so that students can express opinions and information about the lessons discussed. As explained by Queille and Sifakis [2] representation ability is the ability to solve problems in mathematics learning. To understand. The lesson requires mathematical representationsto facilitate understanding of mathematics, namely mathematical representations, mathematical representations, namely how to solve problems by finding solutions that are easy to understand [3].

From the existing problems, improvements are needed to improve learning outcomes, by using a learning methodwhich is different from before, the mathematical representation is using a learning model, one of which is *Problem Possing*. *Problem Possing* is a learning model by encouraging students to solve problems in a simple way [4].

According to research Kwiatkowska, Normanand Parker [4], itwasfoundthatthere were differences in studentscoresbetweenusingthe*Problem Posing model* andwithoutusingthe*Problem Posing model* at SD Negeri 67 Bengkulu. These differences are found in student grades, student participation and the way the teacher delivers the material. Based on this, it is necessary to emphasize learning mathematics in the classroom using problem posing through the zoom application.

2 Method

This research is to see the effect of student learning outcomes using the *Problem Posing model* on students' mathematical representations. The design in the research is in the form of a *pretest* and *post* as the following equation.

$$\begin{array}{llll} \mathbf{R} & \mathbf{O_1} & \mathbf{X} & \mathbf{O_2} \\ \mathbf{R} & \mathbf{O_3} & & \mathbf{O_4} \end{array}$$

Research Design Form [5].

Information:

O_1: Pretest in the experimental room

O_3: Pretest in the control room

O_2: Posttest in the experimental room

O_4: Posttest in the control room

Table 1. Population of students of SMP Negeri 16 Bengkulu City

Class	Number of students
7A	32
7B	32
7 C	32
7 D	32
7 E	32
7 F	32
7 G	32

Researcher's place is SMP Negeri 16 Bengkulu. This experiment or research was conducted in the second semester of the 2020/2021 academic year. The population is the students of SMP Negeri 16 Bengkulu. The following is the total student population at SMP Negeri 16 Bengkulu (Table 1).

To get a sample in the study, it was done randomly by making numbers on paper and writing grades 7A to 7G and then shaking it like a social gathering. The paper that fell was the class that was chosen to be the experimental sample. The selected class is given learning using the Problem Posing model. The number of samples obtained is in class 7 E and 7 F where the number is 64 students. The experimental class applies learning with Problem Posing in class 7 E, while the learning control class without problems Posingin grade 7 F. The research instrument is a test of mathematical representation ability in the form of a description of 5 items. Indicators to measure the ability of mathematical representation are: (1) using mathematics in everyday life, (2) using mathematical relations with the material, (3) applying data in the form of diagrams, graphs or tables, (4) applying media images, graphs and tables to get a solution. The scoring guidelines are as follows [6] (Table 2).

The method of collecting data in this research is using the pretest and posttest result sheets. The test instrument was tested for validity using the Aiken index formula, which is as follows:

$$= \_\frac{\sum (\mathrm{r}_k - \mathrm{l}_0)}{[n(c-1)]} [7]$$

Information:
r_k k-th rater
l_o = lowest validity rating score
c = the highest number of validity assessments
n = the number of experts & practitioners who carry out the assessment
i = integers from 1,2,3 to the nth with n = number of raters

Table 2. Population of students of SMP Negeri 16 Bengkulu City

Measured Aspect	Score	Scoring Guidelines
1. Use mathematics in everyday life.	0	Blank answer
	1	State only what is known.
	2	Just state what is known and asked.
	3	Express what is known with the symbol.
	4	The answers are all correct.
2. Using relationships on topics.	0	Blank answer
	1	Just stating what is already known.
	2	Just state what is known and asked.
	3	Express what is known with the symbol.
	4	All answers are correct
3. Provide data in the form of diagrams and graphs.	0	Blank answer
	1	State only what is known.
	2	Just state what is known and asked.
	3	Express what is known by symbol.
	4	The answers are all correct.
4. Provide a visual picture to solve the problem.	0	Blank answer
	1	Presenting problems without visual representation.
	2	Presenting problems using visual representations.
	3	Presenting problems using visual representations and not solving them.
	4	Presenting problems using visual representations and solving them correctly.

Data analysis was carried out by covariate analysis, namely the Ancova statistical test. The data analyzed were the results of the *pre-test* as a covariate (contributing) variable and the results of the *post-test* (the ability of mathematical representation and mathematical communication).

3 Result and Discussion

See Figs. 1, 2, and 3.

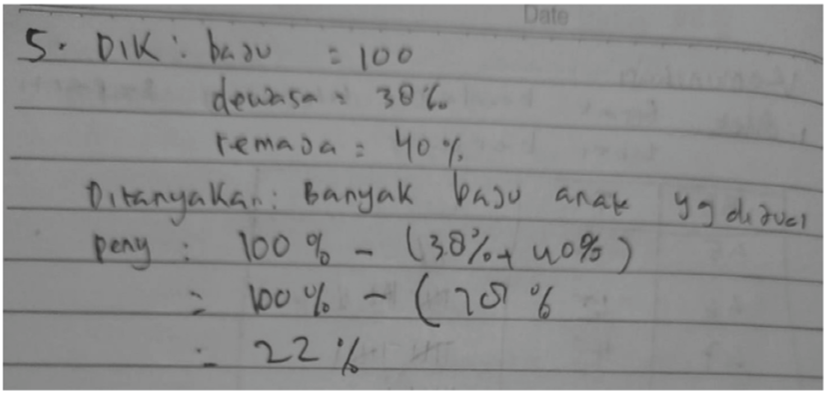

Fig. 1. In the picture, it can be seen that students have been able to communicate the questions so that they can write down what is known and asked. And can solve problems. Based on this, students have been able to achieve the given indicators.

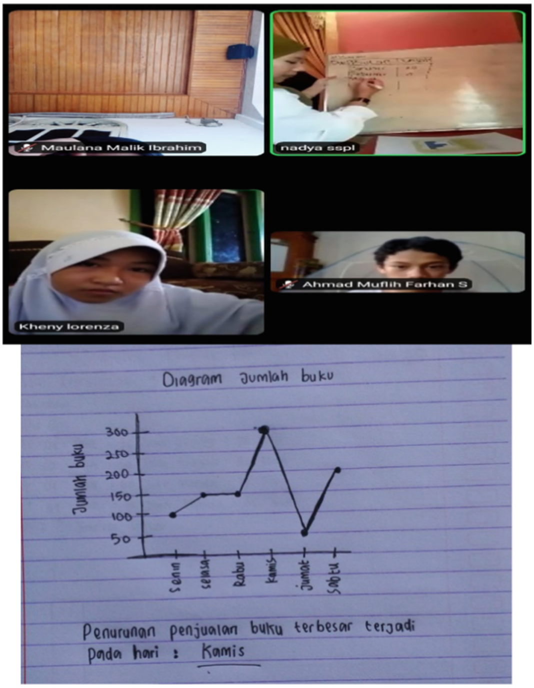

Fig. 2. In the picture, shows that at the stage of presenting the material, students pay attention to the teacher in delivering the material through zoom and share screen applications. Furthermore, students have been able to compose their own questions or questions based on the information provided. Based on the learning process students have been able to compose themselves and communicate mathematics through questions or questions. The following picture is the stages of students asking questions.

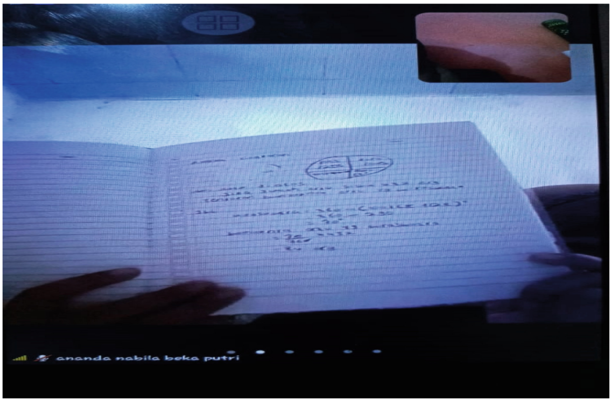

Fig. 3. Based on the picture, students have been able to formulate problems from the information provided. The questions made by students are on average correct and refer to the material. Furthermore, in terms of student test results, the data on the results of tests of mathematical communication skills and mathematical representations of students generally show that in each. There was an increase in the class between the pretest and posttest. The differences that occurred before and after learning were given showed a significant increase. On average, students' mastery of the material was more than 70 percent of the measured test questions. Here are some examples of student answers in solving questions.

4 Conclusion

According to the student score data, it can be seen that students' scores using the problem posing model with the help of the zoom application are better than learning using the zoom application without problem posing, this is evidenced by the data obtained during the experiment.

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