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## The Potential of the Problem Posing Method on Mathematics Learning Outcomes: A Study in Grade IX-G Students of SMPN 244 Jakarta, Indonesia

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### ABSTRACT

Mathematics is still one of the subjects that is less attractive to students. Students often think that mathematics is difficult or even boring. The posing method is one of the efforts that can be developed in order to be a solution in the process of teaching mathematics so that mathematics is no longer something difficult and frightening. A posing method is an approach to learning mathematics where students are not only oriented to solving a problem. However, students participate in making questions. This study aimed to determine the potential of the posing method in improving mathematics learning outcomes in grade IX-G students of SMPN 244 Jakarta, Indonesia. This study is an experimental study with a pre-post test design approach. A total of 36 research subjects participated in this study. The posing method intervention in this study consisted of 2 cycles, with 2 meetings in each cycle. Furthermore, re-intervention and evaluation of the implementation of cycle II as in cycle I. The success of the posing method is carried out by assessing student learning outcomes. Data analysis was carried out in a univariate manner by comparing the average and frequency of student learning outcomes. The results of the study showed that there was a shift in learning outcomes from those that were initially at a score of 5 and then experienced improvement after the posing method was applied to the majority of scores 8 and 9. In conclusion, the posing method has the potential to improve mathematics learning outcomes in grade IX-G students of SMPN 244 Jakarta, Indonesia.

### 1. Introduction

Mathematics is a subject that is unique compared to other subjects. Mathematics is sometimes understood by students and or sometimes by teachers only as an aspect of right and wrong. Mathematics does not only emphasize aspects of solving mathematical operations, but there is something more important that becomes an important point of learning mathematics, namely problem-solving skills. Problem-solving is a way of thinking that is not only oriented to the final result. Problem-solving is a process-oriented way of thinking to solve problems and is not only result-oriented. The ability of students to explore the process of solving problems will trigger students to think creatively in solving problems. Students will have an understanding

that in solving problems, there is not only one way, but in fact, there are many ways to solve problems. Aspects of student creativity will be facilitated and trained to be developed in dealing with various problems in life. Creativity is an important aspect that will play a major role in the success of each student in their daily life in the future.<sup>1-5</sup>

Mathematics is still one of the subjects that is less attractive to students. Students often think that mathematics is difficult or even boring. Several studies show that students' disinterest in mathematics is caused by students' assumptions that mathematics is difficult because to answer math questions, one has to memorize certain formulas. Of course, a breakthrough needs to be made to find a solution so that mathematics

does not become a subject that is not in demand, bearing in mind that the role of mathematics is very important in supporting the success of student's lives and careers in the future. The posing method is one of the efforts that can be developed in order to be a solution in the process of teaching mathematics so that mathematics is no longer something difficult and frightening. A posing method is an approach to learning mathematics where students are not only oriented to solving a problem. However, students participate in making questions. In the process of creating questions, students will learn the philosophy and rationale of completing a mathematical operation. Students will not only memorize formulas but can explore in depth the basis for the development of these formulas.<sup>6-11</sup> This study aimed to determine the potential of the posing method in improving mathematics learning outcomes in grade IX-G students of SMPN 244 Jakarta, Indonesia.

## 2. Methods

This study is an experimental study with a pre-post test design approach. This study was conducted at SMPN 244, Jakarta, Cilincing Bakti VI Street/No. 28, Cilincing Sub District, Cilincing District North Jakarta, Jakarta, Indonesia. A total of 36 research subjects participated in this study, where the research subjects met the inclusion criteria. The inclusion criteria are students in grade IX-G SMPN 244 Jakarta, Indonesia.

The posing method intervention in this study consisted of 2 cycles, with 2 meetings in each cycle. The steps in each cycle are planning, action, observation, and reflection. The main material to be delivered in the first cycle is comparison and scale. The teacher's willingness to carry out learning activities using the method of problem posing. Method Held by asking students to make 1 question related to comparison and scale. After that, students were asked to collect these questions, then asked each student to take 1 question to solve. The implementation of learning is carried out 2 times, with the last meeting conducting a cycle evaluation to find out the

acquisition of students' abilities in mastering comparison and scale material. Researchers plan to learn problem-posing based on the results of observations and reflections in the first cycle and make an action research plan that is in accordance with the problems that have previously been studied. Develop a mathematics learning plan for students whose classes are researched and guided by the research design. Researchers act as material providers with collaborators, namely colleagues. Furthermore, re-intervention and evaluation of the implementation of cycle II as in cycle I. The success of the posing method is carried out by assessing student learning outcomes. Data analysis was carried out in a univariate manner by comparing the average and frequency of student learning outcomes.

## 3. Results and Discussion

Figure 1 presents a comparison of student learning outcomes before the intervention and after the intervention of cycle I and cycle II. Student learning outcomes in the initial conditions before the posing method intervention, the majority of the research subjects had a score of 5. After the intervention by the posing method in cycle I, it was seen that the majority of the subjects in the research already had scores of 5.6 and 8. Meanwhile, after cycle II, it was seen that the majority of research subjects already had a score of 8, followed by a score of 9. The study results showed that there was a shift in learning outcomes from those that were initially at a score of 5 and then experienced improvement after the posing method, being the majority of scores 8 and 9.

Mathematics is needed so that someone can solve abstract and practical problems by using formal and non-formal patterns and relationships. Mathematics is also needed because humans learn about patterns and relationships, how to think strategically, organization, analysis, and synthesis, as well as tools for solving abstract and practical problems. One method that is currently being used by teachers is the problem-posing method. Problem posing is the activity of formulating questions or problems by students.

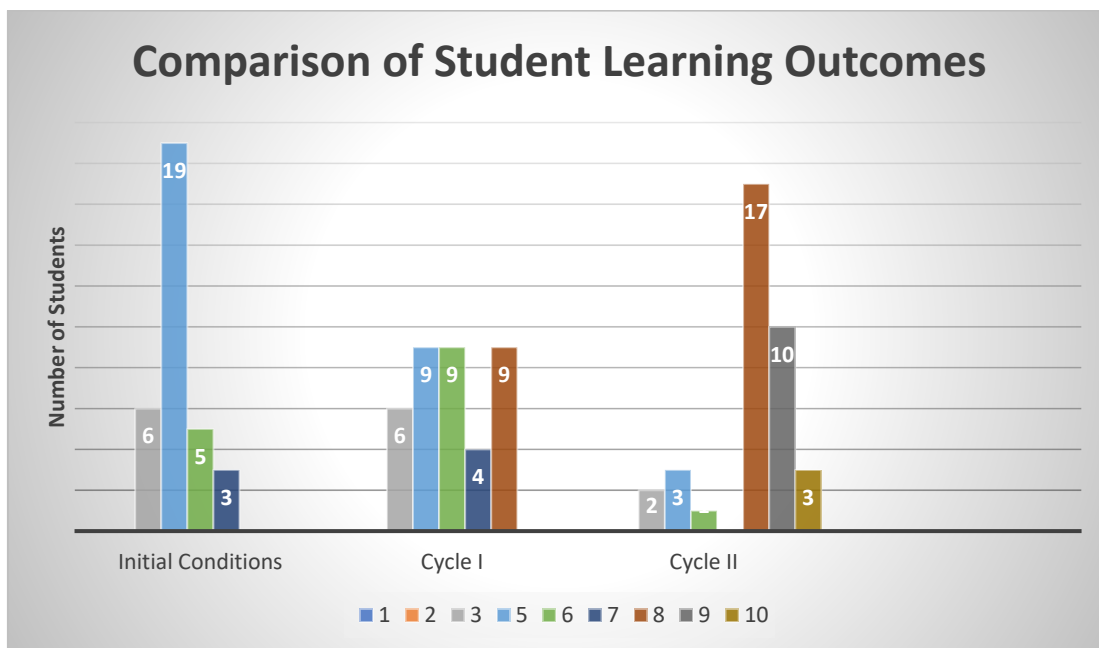


Figure 1. Comparison of student learning outcomes before the intervention and after the intervention cycles I and II.

Students are only given certain situations as a stimulus in formulating questions/problems. In connection with the situations used in the formulation of problems/questions in mathematics learning, questions can be constructed in several forms, including images, manipulative objects, theorem/concept games, teaching aids, questions, and solution Problem posing questions can also be divided into two kinds of situations or contexts, namely formal contexts which can be in the form of symbols (mathematical sentences) or in verbal sentences, and informational contexts in the form of games in pictures or sentences without a specific purpose.<sup>12-14</sup>

The results of this study show the potential of the posing method in improving learning outcomes subject study. The results of this study are in line with several studies which show that the posing method is effective in improving students' understanding of mathematics. The posing method provides an experience for students to participate and participate in the learning process. Students do not only act as objects but students are expected to act as subjects. The posing method gives students the opportunity to explore further mathematics learning material.<sup>15,16</sup>

#### 4. Conclusion

The posing method has the potential to improve mathematics learning outcomes in grade IX-G students of SMPN 244 Jakarta, Indonesia.

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