Advances in Social Science, Education and Humanities Research, volume 611
International Conference on Educational Studies in Mathematics (ICoESM 2021)

Analysis of Mathematical Problem-Solving Skills of Grade VIII Students in Completing Number Patterns Essay Exercise

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ABSTRACT
This qualitative research aimed to determine the math problem-solving skills of grade VIII students at SMP Negeri 2 Sungguminasa in solving number patterns essay exercises based on Polya steps. The subject of the study was a grade VIII student at SMP Negeri 2 Sungguminasa with three students. In taking subjects in this study used the Purposive Sampling technique with the Maximum type Variation. The instruments in this study used tests with three problem-solving questions and interview guidelines. Then it continued with triangulation techniques. This research's data analysis techniques used the Miles and Huberman models, namely data reduction, data presentation, and conclusion. The results showed that students with high categories could solve the problems at each stage of problem-solving correctly. Students in the category were solving the problem given and solving it correctly, but they were still less systematic in some other stages. Students with low categories could not understand the problem and have not been able to meet different stages.

Keywords: *Analysis, Mathematical problem-solving, Completing Number.*

1. INTRODUCTION

Education is a planned endeavor to develop self-potential, build the character and culture of a dignified nation, and educate the nation's life. As the nation's next generation, students will solve different life challenges with the capital of science and abilities gained through education.

Mathematics is one of the components of Indonesia's national education curriculum. Mathematics is a basic science that has an essential role in daily life and the development of science and technology. It is in line with Hudojo's expression in Wahyuddin [1] that "In modern development, mathematics plays an important role because all sciences are perfect."

Learning mathematics in school is a clear, critical, creative, systematic, and logical means of thinking. It effectively solves daily life problems, recognizes the patterns of relationships, generalization of experience, and develops creativity. Mastery of science, technology, and technical skills related to science is called Hard Skills. As one of the hard skills, mathematical problem-solving skills is very important to be mastered by students who learn mathematics.

In Hendriana [2], Polya suggests that problem-solving is an attempt to find a way out of a goal that is not easy to achieve immediately. Mathematical problem-solving skills are skills that students must have because problem-solving provides an excellent benefit for students. Students are said to solve math problems if they can understand, choose the right strategy, and then apply it to be problem-solving.

That is in line with what was presented above. Observations at SMP Negeri 2 Sungguminasa obtained information that students tend to be confused when given essay questions. From these questions, students are faced with a problem or task where there is no direct way or formula to find a solution. Students need to find out what they are looking for, what information about the problem, and what strategies to find solutions (the answers). Students' difficulty in solving mathematical problems will impact the low learning outcomes of students, so the objectives of

mathematics learning as described earlier are not achieved to the maximum.

The problem-solving process becomes an integral part of the mathematical learning process. Even in everyday life, problem-solving skills are indispensable because problem-solving skills have become the need of every profession.

Mairing [3] defines problem-solving as thinking directed at getting answers to problems. Thinking is a process, so problem-solving can be seen as a process. Thus, the process of students obtaining solutions to a solving problem is more important than the answer. According to Polya in [4] point out that problem-solving is an effort to find a way out of a difficulty to achieve a goal that cannot complete it immediately.

Mathematical problem-solving in this study was a strategy used in understanding, selecting, and solving problems using a specific model. Problem solving also needs to be trained to develop the ability with the teacher's help or a problem-solving exercise. Solving problems is an important thing that students must have because problem-solving is not only used in math lessons. But can also be used in daily life and the future.

2. RESEARCH METHODS

The type of research used was qualitative research. The technique of taking the subject of this study used purposive sampling type maximum variation. Many of the subjects in this study were students in grade VIII at SMP Negeri 2 Sungguminasa, who had low or very low, medium and high or very high problem-solving skills.

The data collection techniques used in this study were observations, tests, and interviews. Tests were given to students in the form of essay questions. Each question was able to measure the problem-solving skills of students. Interviews in this study were conducted face-to-face with the research subjects. There were very common interview guidelines in the interview process, which included essential things and questions developed and adapted by themselves when in the field.

This study was used to test the validity of data by using time triangulation. Researchers checked the validity of the collected data by giving back the tests with the same questions and interviews at different times.

3. RESULTS AND DISCUSSION

Based on the initial data that has been collected through the problem-solving skills test of the number pattern essay exercises. The information was obtained that there were three problem-solving skills categories in grade VIII at SMP Negeri 2 Sungguminasa: 10 students with high problem-solving skills, 8 moderately capable students, and 12 students with low skills. Students in the high category solve problems and the problem-solving stage, namely understanding problems, drawing up plans, executing plans, and reevaluating. Have a positive attitude towards solving mathematical problems. Students' understanding of the benefits of mathematics in everyday life is the primary motivation for learning mathematics. Students in the high category have reasonable confidence.

Students in the moderate category categorized solve problems by referring to the troubleshooting stage. Students can understand the problem but do not entirely write down the known and asked information. Students in the moderate category can draw up a complete plan but are limited to one way. They execute the settlement plan well and believe in the correctness of the answer after evaluating the solution. They have a positive attitude towards solving problems.

Students in the low category are unable to solve problems as they do in the problem-solving phase. Students do not understand the problem, so they are unable to plan a solution. Their lack of expertise is due to the lack of intensive training in solving problems. Students in the low category are less motivated because they do not understand the benefits of learning mathematics in everyday life.

4. CONCLUSION

Based on the results of research and discussion that has been described, the following statutory obtained:

Students in the high category solve problems and the problem-solving stage, namely understanding problems, drawing up plans, executing plans, and reevaluating. Have a positive attitude towards solving mathematical problems. Students' understanding of the benefits of mathematics in everyday life is the primary motivation for learning mathematics. Students in the high category have reasonable confidence.

Students in the moderate category categorized solve problems by referring to the troubleshooting stage. Students can understand the problem but do not entirely write down the known and asked information. Students in the moderate category can draw up a complete plan but are limited to one way. They execute the settlement plan well and believe in the correctness of the answer after evaluating the answer. They have a positive attitude towards solving problems.

Students in the low category are unable to solve problems as they do in the problem-solving phase.

Students do not understand the problem, so they are unable to plan a solution. Their lack of expertise is due to the lack of intensive training in solving problems. Students in the low category are less motivated because they do not understand the benefits of learning mathematics in everyday life.

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