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Mathematical Problem Solving Ability Viewed from Self-Efficacy of 7th Grade Students

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Abstrak

Problem-solving ability is one of the standard mathematical abilities that students must have. This ability can be mastered well by students if students have affective abilities, one of which is self-efficacy. The aim of this research is to describe mathematical problem-solving abilities based on the self-efficacy of VII grade students in MTs Negeri 1 Semarang. This research method is descriptive qualitative. The technique of taking the subject was taken by six subjects by purposive sampling. The results showed that the description of mathematical problem solving abilities in terms of student self-efficacy varied, namely (1) students with high self-efficacy obtained six high category students' mathematical problem solving abilities and one medium category student and able to master four indicators of mathematical problem solving abilities is very well, (2) students with medium self-efficacy obtained mathematical problem solving abilities as much as one high category student, 18 medium category students, one low category student, but only good problem solving abilities on two indicators, (3) students with low self-efficacy, the results were five students in the medium category and two students in the low category, but they did not fully have complete mathematical problem solving abilities in all indicators of mathematical problem solving abilities.

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INTRODUCTION

Mathematics as one of the main subjects given at every level of education in Indonesia indicates that mathematics is very important to learn. Mathematics education aims to make students actualize learning at the highest level (Novriani & Surya, 2017). Mathematics learning in secondary schools is directed so that students are able to solve problems related to mathematics or with contextual problems around their environment that can be solved using mathematics.

The ability to solve mathematical problems is a part of learning mathematics which is very important in mathematics education as quoted by Lestari et al. (2016) "Problem solving is an integral part of all mathematics learning", which emphasizes the importance of problem solving because problem solving is an integral part of learning mathematics, so it cannot be separated from learning mathematics. Problem solving in mathematics can also help students to solve daily life problems by applying their mathematical knowledge and skills (Osman et al., 2018). Problem solving abilities are strategic abilities or competencies shown by students in understanding, choosing approaches and strategies, as well as complete ways to find solutions to a problem (Lubis et al., 2017).

However, the students' problem solving ability is still low. Many students think that mathematics is a difficult subject so the students do not think deeply in receiving material (Ramdhani et al., 2017). This is in accordance with the opinion of Junaedi (2012) that the results of international research related to the performance of students in Indonesia in solving problem solving problems are still not satisfactory.

Abilities affect to low problem-solving student learning outcomes. So the students' problem-solving abilities are very important to be developed because they are in accordance with the goals of education in Indonesia. A question or question posed to students is a problem for student if the question or problem cannot be solved immediately by students with routine procedures but provides stimulation and challenges to be answered. A person with low achievement is caused by the low self-confidence in solving math problems (Riskiningtyas & Wangid , 2019).

Self-efficacy plays an important role because the existence will motivate someone to be more organized and assess themselves as a form of preparation for facing challenges in order to achieve planned goals (Hanifah, et al., 2020). Self-efficacy is one of the most important affective aspects of every individual (Ozgen, 2013; Vanhaltren, 2016). Self-efficacy is a self-belief about the abilities that students must have in order to succeed and achieved goals in the learning process (Koyuncu et al., 2017). According to Bandura as quoted by Sunaryo (2017), self-efficacy is a person's assessment of his ability to organize, control, and carry out a series of behaviors to achieve a desired result. A person who has high self-efficacy will complete his task diligently, thoroughly and never give up in facing difficulties, while people who have low self-efficacy tend to give up easily and are not maximal in completing the tasks they are doing (Yuliana & Winarso, 2019).

Self-efficacy refers to the consideration of how much a person believes in his ability to carry out a number of learning activities and his ability to complete learning tasks (Somawati, 2018). When people believe that they have the abilities needed to complete a given task, greater effort and persistence will be made towards achieving the goal (Marion et al., 2015). Bandura states that the measurement of a person's self-efficacy refers to three dimensions, namely magnitude, strength, and generality (Bandura; Yuliana & Winarso, 2019).

Based on the description above, theoretically problem-solving abilities and self-efficacy have a mutually influential relationship and play an important role in achieving learning goals. The absence of similar research, this motivates and becomes the basic reason for researchers to conduct research related to mathematical problem solving abilities based on student self-efficacy.

The formulation of the problem in this study is how mathematical problem solving abilities in terms of self-efficacy of class VII students.

METHODS

The research method used in this research is descriptive qualitative research. Descriptive research was carried out to obtain a deep understanding of the situation and the meaning of something the subject being studied (Ulya, 2016).

The research was conducted at MTs Negeri 1 Semarang in the odd semester of the 2019/2020 school year. The research subjects were selected from class VII B based on certain considerations. The subject selection process is carried out by determining the subject selection criteria. The criteria referred to are (1) students have received quadrilateral material; (2) students have complete answers; (3) meet the criteria for self-efficacy; (4) the subject is selected with the consideration of good communication so that the disclosure can take place properly. The subjects selected in this study were six students with two students in each category of self-efficacy.

Researchers used self-efficacy questionnaires, problem-solving abilities tests, and interviews to obtain data from the same source. Qualitative data collection and analysis is used to describe students' mathematical problem-solving abilities in each self-efficacy category, namely high, medium, and low.

RESULT AND DISCUSSION

Students in class VII B are given a self-efficacy questionnaire to group students into high, medium, and low self-efficacy groups. The following are the results of the student self-efficacy questionnaire presented in Table 1.

Table 1. Result of Grouping Self-efficacy.

Group	Number of Subject
High	7
Medium	20
Low	7

The results showed that learning descriptions of mathematical problem solving abilities in terms of student self-efficacy varied. This is shown by the seven students with high self-efficacy, the results of the mathematical problem-solving abilities were obtained, namely six high category students and one medium category student. From 20 students with medium self-efficacy, the results of mathematical problem solving abilities were one high category student, 18 medium category students, and one low category student. Seven students with low self-efficacy obtained the results of mathematical problem solving abilities in the form of five low category students and two low category students.

Students with high self-efficacy are able to meet the four indicators of mathematical problem-solving abilities well because both subjects are very enthusiastic and try to seriously participate in learning and have confidence in their abilities. Subjects with a high level of self-efficacy tend to be able to solve all questions correctly according to the indicators of mathematical problem solving abilities, namely students are able to write down what is known and asked of the problem, students are able to make problem solving strategies by writing the right formula, students are able to carry out plans has been selected by calculating correctly and writing the correct units, and students are able to reflect back on the work that has been obtained by writing the conclusions of the problem. However, there is a little doubt, but the subject can make the right decision according to the questions given, for example students with high self-efficacy do not illustrate pictures well even though they can understand the questions well when being interviewed. This is in line with Bandura's opinion in Subaidi (2016), that students who have strong or high self-efficacy will be more able to withstand math problems and not give up in meeting failure. Self-efficacy can increase student success in solving math problems well, this is if students who have high self-efficacy will have greater self-efficacy and self-confidence and are confident that they can solve and solve problems in mathematics (Amalia, et al., 2018). This is in line with the opinion of Schunk and Pajares in Alifia & Rakhmawati (2018) which states that with high self-efficacy, in general, a student will find it easier and succeed in surpassing the exercises given to him, so that the final results of learning are reflected. in academic achievement also tends to be higher than students who have lower self-efficacy. This is also in line with Bandura's opinion in Subaidi (2016), that students who have strong or high self-efficacy will be more able to withstand math problems and not give up in meeting failure.

Students with medium self-efficacy only have good mathematical solving abilities on two

indicators of mathematical problem solving abilities. Subjects with a medium level of self-efficacy have not been able to solve all the questions correctly in accordance with the indicators of mathematical problem solving abilities, namely the subject is able to write what is known but there are those who cannot write down what is asked of the problem then the subject cannot understand the problem well, the subject is able make a problem solving strategy by writing the right formula but there are those who cannot write the formula correctly so that they cannot solve the problem properly, students are able to carry out the plan but there is something wrong in doing the calculations correctly and have not written the correct units, and students are less capable reflect back on the work that has been obtained by writing the conclusions of the problem. This happens because students have doubts and feel hopeless in solving problems so that the problems cannot be resolved properly. This is in line with the opinion of Pajares Miller in Ningrum et al. (2020) that if students do not have good self-efficacy, students will feel hesitant in using mathematical concepts to be applied to other mathematical concepts. This is also in line with the opinion of Sunaryo (2017) regarding the use of self-efficacy which is to help someone make choices, efforts to progress, persistence and persistence in facing difficulties, and the degree of anxiety or calmness and maintaining tasks. If students do not have good self-efficacy, then students will find it difficult to determine solving problems.

Students with low self-efficacy only achieve one indicator of mathematical problem-solving abilities, namely building new mathematical knowledge through problem solving. Subjects with low self-efficacy can write down what is known and asked can even make picture illustrations, the subject is unable to determine the right strategy in solving problems so that the subject cannot perform calculations correctly, write units correctly, and cannot complete until obtaining the results match what is asked in the problem. This is because students have doubts and easily give up in solving problems so that the problems cannot be resolved properly. This is in line with the opinion of Novferma (2016), that the low self-efficacy of students in mathematics is indicated by students not wanting to try more to do math problems and tend to give up more quickly when getting difficult assignments. This is also in line with the opinion of Nadia et al. (2017) that low self-efficacy students still have difficulty solving a problem by expressing their abstract ideas. In line with this research from Arifin et al. (2017) obtained results that students who have high self-efficacy do not feel afraid, doubtful and ashamed to submit opinions, while those who have low efficacy do not have the enthusiasm to work. Therefore students with low self-efficacy in this study did not get high mathematical problem solving abilities but only medium ability scores.

Based on the results of tests of mathematical problem solving abilities and interviews of research subjects, it can be concluded that high self-efficacy does not necessarily mean high problem-solving ability scores. However, there are students with the category of self-efficacy while the value of mathematical problem solving abilities is higher than students with high self-efficacy. This is in line with the opinion of Pasandaran & Rusli (2016) that students with low self-efficacy show a tendency to think at the relational level, showing relatively the same thinking characteristics as high-efficacy subjects. However, only one student with low self-efficacy scored medium mathematical problem solving abilities, it can be said that students with low self-efficacy were still hesitant in answering the problem solving ability.

CONCLUSION

Based on the results of the analysis and discussion, the descriptions of mathematical problem-solving abilities in terms of student self-efficacy showed mixed results, namely students with high self-efficacy were able to master four indicators of mathematical problem solving abilities very well because students with high enthusiasm for learning and trying Seriously taking part in learning and having confidence in their abilities, (2) students with medium self-efficacy only have good problem solving skills on two indicators have little doubt and feel hopeless in solving problems, (3) students with self-efficacy not yet have complete mathematical problem solving abilities in all indicators of mathematical problem solving abilities because of having doubts, lack of motivation, and easily give up in solving problems.

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