



THE RELATIONSHIP OF SELF-CONFIDENCE WITH THE MATHEMATICAL PROBLEM-SOLVING ABILITY OF JUNIOR HIGH SCHOOL STUDENTS

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Abstract: The purpose of this study is to describe the relationship between self-confidence and mathematical problem-solving ability in finding solutions to linear equations among junior high school students. This study utilizes a qualitative approach with a correlational design. The subjects of this study are the 32 students of class VIII D at SMP Negeri 12 Pontianak. The instruments are used including a self-confidence questionnaire and a test on the ability to solve problems related to linear equations. Data analysis employs the Pearson Product Moment correlation. The data shows that the students of class VIII D have a good level of self-confidence in learning mathematics. The majority of these students also possess good mathematical problem-solving abilities. Based on the calculation of the Pearson Product Moment correlation, the obtained correlation coefficient (r-value) between self-confidence and mathematical problem-solving ability for the students of class VIII D at SMP Negeri 12 Pontianak is 0.366, indicating a low correlation. However, there is a positive and statistically significant relationship between self-confidence and mathematical problem-solving ability, implying that an increase in self-confidence tends to correspond with an improvement in students' problem-solving skills.

Keywords: linear equations; mathematical problem-solving ability; self-confidence

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Introduction

The quality of education from basic education institutions to universities can be assessed based on learning outcomes (Nur & Damayanti, 2021). Learning outcomes refer to the abilities that students develop through the learning process, which leads to changes in their knowledge, understanding, attitudes, and skills, ultimately enabling them to perform at a higher level (Putri et al., 2021). Learning outcomes culminate in the learning journey (Nugraha & Kamilah, 2024; Prawiyogi et al., 2022). According to Asih (Sutangsa, 2021), learning outcomes include the students' skill acquired from their educational experience. Therefore, learning outcomes describe what students have achieved after studying, the result of changes and improvements in students' knowledge, attitudes, and skills.

Learning outcomes can also be described as changes that occur intellectually, mentally, and physically (Ariyanto, 2016; Mulia et al., 2021). These changes are influenced by the educational process, both formal and non-formal. The desired learning outcomes include the students' ability gain after gaining knowledge through learning, including cognitive, attitude, and psychomotor skills (Hutauruk & Simbolon, 2018). Evaluation activities are carried out to find out the extent to which students have

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achieved their learning objectives. In addition, assessing learning outcomes is very important in determining the effectiveness of student learning and evaluating the suitability of the teaching methods used by teachers (Yusmanita et al., 2018).

Following the National Education system, learning outcomes are based on Bloom's Taxonomy, which proposes three domains in education: 1) cognitive, 2) affective, and 3) psychomotor (Magdalena et al., 2020). Knowledge, understanding, application, analysis, synthesis, and evaluation skills are part of the cognitive domain (Rosyidi, 2020). The affective domain is related to attitude, attention, interest, and beliefs (Ulpah, 2017). Finally, the psychomotor domain is associated with manipulative or motor activities and creativity (Baharom et al., 2015; Rahman et al., 2020). These three educational domains, as stated by Bloom, show significant relationships with each other (Khidzir et al., 2016).

The results of research by (Endah et al., 2019), students' problem-solving ability is considered an important competency for learning mathematics. Problem-solving involves a sincere effort to find a solution or generate ideas to achieve a specific goal. This is a complex process that requires individuals to combine their experience, knowledge, understanding, and intuition to respond to the requirements of a situation or problem (Roebyanto & Harmini, 2017). Problem-solving plays an important role in mathematics, including tasks such as solving word problems, identifying patterns, interpreting visual representations, proving theorems, and more. Engaging in problem-solving activities can also trigger students' interest and curiosity, thereby motivating them to actively participate in solving mathematical problems (Suryawan, 2020).

Research conducted by (Ramlan et al., 2021) involved 56 student participants and revealed interesting findings regarding self-confidence and mathematical problem-solving abilities. Six participants showed high self-confidence, 24 participants showed medium self-confidence, and 26 participants showed low self-confidence. 5 students showed high ability in solving mathematical problems, 24 students showed medium ability, and 27 students showed low ability (Biegur, 2020; Santi et al., 2021). It involves the belief that appropriate thinking and action can be used to achieve specific interests and goals, as initiated by individuals, in this case, students. According to (Fitriyani et al., 2020), self-confidence represents the belief that an individual can achieve the desired results. It is a trait that indicates a strong belief in one's abilities, desires, and aspirations. Additionally, self-confidence empowers individuals to approach various tasks or problems with confidence, enabling them to effectively overcome the challenges they face and achieve desired results.

The findings indicated that students who have self-confidence have better abilities in fulfilling the four indicators tested regarding solving mathematical problems. Although not as good as students who have a high level of self-confidence, students who have a moderate level of self-confidence still show better abilities in solving problems compared to students who have a low level of self-confidence. On the other hand, students who lack self-confidence have difficulty demonstrating their ability to solve mathematical problems related to these four indicators. These results illustrate the important influence of students' self-confidence on their problem-solving skills. Problem solving is usually easier for students with high self-confidence compared to those with low self-confidence, who have more difficulty.

In research conducted by (Aisyah et al., 2018) involving 31 student participants, it was found that students' abilities to solve mathematical problems were at a medium level. This shows that they have room to grow in terms of their capacity to solve mathematical puzzles. The results of this research also show that there is a relationship between junior high school students' self-confidence and their ability to solve mathematical problems. Higher self-confidence is specifically associated with greater math problem-solving skills.

These findings have significant consequences for lower secondary mathematics education. Students' self-confidence can be positively influenced by improving their ability to solve mathematical problems. As a result, educators must focus primarily on helping students improving their ability to

solve mathematical problems. As a result, it can increase their confidence in dealing with complex mathematical problems.

An individual's level of self-confidence significantly influences their ability to solve mathematical problems. Students who have a high level of self-confidence can develop confidence in solving mathematical problems, especially in learning to solve straight-line equations. This research aims to examine the relationship between junior high school students' abilities in solving mathematical problems when solve straight-line equations.

Observations made by researchers from 1 to 6 August 2022 regarding student attitudes at school, it turned out that there were variations in the attitudes displayed by students during the learning process. Different attitudes are observed among the students, which are indicated by various symptoms. These symptoms include students confidently submitting themselves to solve questions on the board, giving different answers without fear of being wrong or right, independently completing assignments, being willing to overcome their shortcomings and trying to correct answers when errors occur, actively participating in answering questions asked by teachers, and students who are hesitant or refuse to come forward and work on questions in front of the class because they are hesitant or afraid of making a mistake. In addition, some students are reluctant to participate in discussions and do not provide opinions or ideas when faced with problem-solving tasks. Additionally, when students receive wrong grades or face challenges, some of them easily give up and choose to copy their classmates' work rather than persevere and try to improve their answers.

Indications of students' diverse attitudes reflect the characteristics of their self-confidence. Apart from that, it can be concluded that students' mathematical problem-solving abilities are still low desired level. This conclusion is supported by an analysis of students' answers when solving word problems related to straight-line equations. It can be seen that students are not used to clearly stating what they know, asking questions, preparing plans, implementing these plans, and reflecting on the process of solving the problems given.

Method

A qualitative approach with a correlational design was used in this research. The choice of a qualitative approach was due to the researcher not providing special treatment during the research. This research was conducted at SMP Negeri 12 Pontianak, with participants consisting of 32 students of VIII D class. This research consists of three stages, namely the initial stage, the implementation stage, and the final stage.

In this research, data will be collected using two instruments, namely questionnaires and tests. The questionnaire consists of 35 statements related to self-confidence, including positive and negative statements. Students were asked to rate their agreement with each statement using a Likert scale. This will help determine the student's level of confidence. Additionally, tests will be given to assess how well students can solve math problems.

There will be four narrative essay questions on the test. Students must solve problems and write their explanations in written form. The test results will explain the level of students' ability to solve mathematical problems. These tests and questionnaires will be used to collect data so that researchers can see how mathematical problem-solving abilities and self-confidence are related. Two experts, namely a mathematics education lecturer at FKIP Untan and a guidance and counseling lecturer at FKIP Untan, validated the instruments used in this research. Device trials were carried out at SMP Negeri 12 Pontianak after the validation stage. After the trial, validity calculations were carried out, including evaluating the validity of the instrument. The reliability of the instrument was also assessed and found to be very high. Next, the Difficulty Index is calculated on three different scales: easy, medium, and difficult. The Pearson Product Moment Correlation Test and data analysis method are used.

In this research, students' self-confidence and mathematical problem-solving abilities will be classified into five levels, namely very good, good, quite good, not so good, and not good. The categorization of students into these levels will be based on their scores on the questionnaire that measures self-confidence and tests that assess their mathematical problem-solving abilities (Pradnyana, 2020).

Researchers will use the correlation coefficient to test the relationship between self-confidence and mathematical problem-solving abilities. According to (Syamsuni & Rantisari, 2021), the Product Moment method will be used in this case to determine the correlation coefficient interval. This method is often used to assess the strength and direction of the relationship between two variables. To ascertain the level of relationship between students' mathematical problem-solving abilities and self-confidence, correlation coefficients will be calculated and interpreted.

Results and Discussion

1. Student Confidence

Based on the results of data processing, it appears that students show a high level of self-confidence, which is an indicator of acting independently when making decisions. A score percentage of 81% indicates that students feel confident in making their own decisions. This is a positive finding because it shows that students can be independent and rely on their abilities and judgment when dealing with assignments or problems. However, it should be noted that the indicator related to daring to express an opinion has the lowest percentage score, namely 58% in the quite strong category. This shows that there is still room for improvement in increasing students' willingness and confidence to express their opinions. Although this score is still quite strong, there is potential to further develop students' abilities to express opinions more confidently.

It is important to take certain actions to increase students' confidence in expressing their thoughts. Teachers can create a supportive and inclusive classroom environment where students feel safe to speak their minds. Providing students with opportunities to speak, such as through class discussions or group activities, allows them to practice expressing their opinions in a supportive atmosphere. In addition, teachers should actively listen to students' opinions and ideas, show respect, and value their contributions. By showing genuine interest in what students have to say, teachers can increase their confidence and encourage further participation. Next, providing constructive and positive feedback to students when they express their opinions can help build their self-confidence. Encouraging and recognizing their efforts will motivate students to continue providing their thoughts and ideas. By implementing this strategy, teachers can foster a classroom atmosphere that encourages students' self-confidence in expressing their opinions, creating a conducive mathematics learning environment, and so on.

Increasing students' courage in expressing opinions, it is hoped that students will become more active in participating in class discussions. Increased participation will allow them to share ideas, contribute to problem-solving activities, and express their understanding of mathematical concepts and principles. This active involvement will further develop their mathematical problem-solving abilities. Additionally, as students gain confidence in expressing their opinions and actively participating in class, they will experience a positive feedback loop. Their increased engagement will further increase their confidence, leading to a cycle of continuous improvement. Ultimately, this will have a positive impact on their overall level of confidence and their ability to tackle complex math problems.

Encouraging students to voice their thoughts and ideas in a mathematical context not only improves their mathematical problem-solving skills but also fosters their overall self-confidence and communication skills. This empowers them to become more active learners and contributors in the

classroom, putting them on a path to academic growth and success. Based on the responses given by 32 students of SMP Negeri 12 Pontianak, the next step was to analyze the data to categorize the students' level of self-confidence. To categorize the level of self-confidence, researchers calculated the frequency or percentage of different answer choices for each statement in the questionnaire. Then, based on the overall pattern of responses, researchers assigned each student to one of five categories: poor self-confidence, poor, fair, good, or very good.

The results of the classification of the level of self-confidence of class VIII D students can be concluded that the majority of students show a good level of self-confidence in studying mathematics. Of the total 32 students, 18 students fell into the good category, indicating that they had a positive level of self-confidence. Additionally, statistical measures provide further insight into the distribution of confidence scores among students. The average score of 61.41 indicates a relatively positive overall level of self-confidence in the class. The median score of 62.50 and mode of 61 indicate that these values are commonly observed in the data set. A standard deviation of 12.841 indicates the degree of dispersion or variability of confidence scores, with larger values indicating more variability. The variance of 164,894 further supports the idea of variation in confidence levels among students.

The value range of 48 reflects the difference between a minimum score of 37 and a maximum score of 85, which shows the extent of the spread of self-confidence scores. This range provides an understanding of the minimum and maximum values in the data set. Overall, data analysis shows that class VIII D students have a good level of self-confidence in learning mathematics. This information can serve as a valuable basis for understanding and addressing students' self-confidence needs and developing strategies to further increase their self-confidence.

2. Students' Mathematical Problem-Solving Ability

Based on existing data, the mathematical problem-solving abilities of class VIII D students can be categorized as follows: 3 students have very good mathematical problem-solving abilities, 19 students have good abilities, 1 student has quite good abilities, 1 student has poor abilities, and 8 students have poor abilities. It can be said that the majority of class VIII D students have good mathematical problem-solving abilities. The average score for the test was 30.78, with a median of 35.00. The most frequently occurring score is 35. The standard deviation is 11.533, indicating a relatively wide distribution of scores. The variance was 133,015, indicating variability in scores. The score range is 31, with a minimum score of 13 and a maximum score of 44. These results indicate that there is room for improvement in students' Mathematical Problem-Solving Ability. Additional support and intervention may be needed to help students improve their problem-solving skills in mathematics.

3. The Relationship between Self-Confidence and Mathematical Problem-Solving Ability in Finding Solutions to Straight Line Equations in Middle School

In class VIII D students at SMP Negeri 12 Pontianak, there was a correlation coefficient (calculated r) of 0.366 between self-confidence and the ability to solve mathematical problems based on the Pearson Product Moment correlation calculation. These results indicate a positive relationship between self-confidence and the ability to solve mathematical problems. Apart from that, the correlation significance value is 0.039, which means the value is below the general significance level which is usually set at 0.05. This shows that the relationship between self-confidence and the ability to solve mathematical problems has a sufficient level of statistical significance to be considered.

The correlation coefficient is 0.366, there is indeed a positive relationship between self-confidence and the ability to solve mathematical problems. However, the strength of the relationship is considered low. This means that there is a tendency that students who have high self-confidence tend to have better mathematical problem-solving abilities, but the relationship is not that strong or too close. In summary, the results of the analysis show that there is a positive but weak relationship between self-

confidence and solving ability mathematics problems in class VIII D students of SMP Negeri 12 Pontianak. This implies that self-confidence plays a role, although limited, in influencing students' mathematical problem-solving abilities.

Conclusion

Based on the results of the research conducted, it is proven that there is a positive and statistically significant relationship between self-confidence and mathematical problem-solving abilities in class VIII D students of SMP Negeri 12 Pontianak. The correlation coefficient (r-value) of 0.366 indicates a positive relationship between the two variables. This means that as students' self-confidence increases, their ability to solve mathematical problems also tends to increase. Although this relationship is not very strong, the research results show that there is a significant influence between self-confidence and mathematical problem-solving abilities in these students. The significance value of 0.039 indicates that the relationship is not due to chance but is statistically significant. This implies that the observed correlation between self-confidence and mathematical problem-solving ability is reliable and can be considered a real association.

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