



Self-Confidence Analysis in High School Students' Mathematics Learning

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ABSTRACT

Self-confidence is an important psychological factor that influences students' success in learning mathematics. Mathematics is often perceived as a difficult subject, which can lead to anxiety, hesitation, and low self-confidence among senior high school students. This study aims to analyze students' self-confidence in mathematics learning and identify the factors influencing it. The research employed a descriptive qualitative method involving senior high school students as research subjects. Data were collected through observation, questionnaires, and interviews to obtain a comprehensive description of students' self-confidence. The results indicate that some students demonstrated low levels of self-confidence, characterized by fear of making mistakes, lack of courage to ask questions, and passive participation during learning activities. Factors affecting students' self-confidence include previous learning experiences, teaching methods, and the learning environment. Therefore, supportive, innovative, and student-centered learning strategies are needed to enhance students' self-confidence in mathematics learning. The study concludes that improving students' self-confidence can contribute positively to their mathematics learning outcomes.

INTRODUCTION

Mathematics is a science that plays a crucial role in education. Learning mathematics can develop students' logical, analytical, and systematic thinking skills. However, most students perceive mathematics as a difficult subject, and they tend to be hesitant and afraid of making mistakes when solving mathematical problems. Lubis (in Rahmawati & Munandar 2025) He argues that two factors influence students' mathematics learning outcomes. The first factor comes from outside the student, namely family, the surrounding environment, and school. The second factor comes from within the student themselves, one of which is self-confidence.

Self-confidence is a trait expected in students to create active learning, while self-confidence is a positive attitude in students to develop positive assessments of both themselves and those around them. Each individual has a different pattern and speed of development. Some are confident, shy, insecure, and so on. Differences in self-confidence levels will affect student learning outcomes. Students with higher self-confidence will achieve better achievement because they always believe in their abilities. Conversely, students with low self-confidence will have less satisfactory learning achievements because they always have negative assumptions and do not believe in their abilities and potential (Masrurroh, 2022). There are four main indicators to measure self-confidence: 1) Believing in one's abilities, 2) Acting independently in making decisions, 3) Having a positive self-concept, and 4) Courage to express opinions. (Annisa & Abadi 2023)

Several previous studies have shown a positive relationship between self-confidence and students' mathematical problem-solving abilities. According to Wulandari (2022), high mathematical problem-solving abilities are influenced by students' high self-confidence. Furthermore, research (Nurhayatun, 2022) found that self-confidence contributes 23.7% to students' mathematical problem-solving abilities. Students with high self-confidence tend to be good at solving mathematical problems (Hidayah, 2022). These studies are limited in their focus on the extent of self-confidence's influence on students' mathematical problem-solving abilities.

Based on observations and interviews conducted by researchers, several facts were obtained, namely that students' mathematics learning outcomes were relatively low. This was due to the large percentage of students who did not complete compared to the percentage of students who completed according to the Minimum Achievement Criteria (KKM) of 75. After conducting observations, researchers suspected that this was caused by a lack of student self-confidence during mathematics learning which was indicated by a lack of active student participation during learning, students were not confident in working on mathematics problems given by teachers, students tended to copy the results of their friends' work and did not dare to ask or express opinions.

Self-confidence is an important personality trait for humans to possess. Student self-confidence is a crucial factor influencing the learning process and learning outcomes. High levels of self-confidence can encourage students to participate more actively, ask questions, and take initiative in learning activities. Low levels of self-confidence often hinder engagement and learning outcomes. Student self-confidence also has a positive relationship with other academic skills, such as asking questions in learning.

Student self-confidence in learning can be improved through appropriate learning interventions. Research conducted by Rais (2024) showed that implementing the Campus Teaching Program in mathematics learning can increase student self-confidence, particularly in expressing opinions and actively engaging during the learning process. Therefore, increasing student self-confidence is crucial to help improve classroom learning.

Based on the introduction, it can be concluded that self-confidence plays a crucial role in mathematics learning. Low self-confidence makes students less willing to try solving problems, passive in learning, and doubtful of their abilities, which in turn impacts poor mathematics learning outcomes. Conversely, students with high self-confidence tend to be more active, independent, and able to achieve optimal learning outcomes. Previous research and field findings indicate that self-confidence is positively related to students' mathematical problem-solving abilities. Therefore, appropriate learning efforts are needed to increase student self-confidence so that the mathematics learning process can be more effective and student learning outcomes can be improved.

METHODS

Types and Methods of Research

This research method uses a qualitative approach with descriptive methods. This approach was chosen to analyze high school students' levels of self-confidence in mathematics learning based on in-depth student responses and experiences. The descriptive method was used to clearly and systematically examine the research results, allowing researchers to gather a concrete picture of students' self-confidence during mathematics learning.

Data Analysis Instruments and Techniques

Data collection in this study was carried out through a self-confidence questionnaire or survey which was designed based on four indicators adopted by Annisa & Abadi (2023), namely: (1) confidence in one's own abilities; (2) independence in making decisions; (3) having a positive self-concept; and (4) courage in expressing opinions. The data obtained were then analyzed by calculating the percentage of student responses or their responses to each statement item. The data obtained were then collected and analyzed to describe the level of student confidence in learning mathematics.

Each item in the questionnaire was analyzed descriptively by converting the data into an attitude scale based on a Likert scale (Lestari & Yudhanegara, 2021). To determine the percentage of student responses to each question, the following formula was used:

$$P = \frac{f}{n} \times 100\%$$

Information :

- P : Percentage of answers
- f : Frequency of answers
- n : Number of students

Next, to obtain the percentage for each question or statement item, which is then interpreted based on the criteria in Table 1 below:

Table 1. Percentage answer criteria

Percentage of Answers	Interpretation of Percentage Answers
0%	Nobody
1 - 24%	Fraction
25 - 49%	Almost Half
50%	Half of it
51 - 74%	Most of the
75% - 99%	Almost All of It
100%	All of it

After obtaining the percentage for each statement item, the next step is to determine the average percentage of student answers or responses per statement item and the overall average which is determined using the formula in Table 2.

Table 2. Average percentage formula

Average answer per item	Average of all answers
$\bar{P}_i = \frac{\sum f_i P_i}{n} \times 100\%$	$\bar{P}_T = \frac{\sum \bar{P}_i}{k} \times 100\%$

Information :

- \bar{P}_i : Average percentage of students' answers to statement i
- f_i : Frequency of student answer choices for statement i
- P_i : Percentage of students' answer choices for statement i
- n : The number of students who answered the statement
- \bar{P}_T : Average percentage of students' answers overall
- k : Number of statement items

Population and Sample

The population of this study consisted of high school students from several schools. The sample consisted of 32 respondents from grades X-XII of high school. The sample was determined using a purposive sampling technique, considering students' willingness to participate in filling out the questionnaire as a source of research data. The use of a purposive sampling technique is appropriate

for descriptive research because this study aims to obtain an overview of students' levels of confidence in learning mathematics, not to make broad generalizations. (Sukriah et al. 2024; Ramadhani et al. 2025)

Research Procedures

The research procedure began with interviews with high school mathematics teachers. The interviews aimed to obtain an initial overview of the mathematics learning process in the classroom and the students' self-confidence during the learning process. The information obtained from the interviews was used as a consideration in determining the research focus and developing the instruments used. After that, the research continued with data collection through the distribution of non-test instruments using Google Forms, namely a mathematical self-confidence questionnaire consisting of 15 statements with four answer choices, namely Strongly Agree (SS), Agree (S), Disagree (TS), and Strongly Disagree (STS).

RESULTS AND DISCUSSION

The results of this study describe the level of student self-confidence in mathematics learning based on four indicators: confidence in one's own abilities, independent decision-making, positive self-concept, and courage to express opinions. The data presented are the results of processing a self-confidence questionnaire administered to 32 respondents. The presentation of the research results is supported by tables and graphs to clarify the descriptive presentation in Table 3.

Table 3.Percentage of self-confidence attitude scale in students' mathematics learning

No.	Indicator	Lots Statement	Total Score	Mean	Presentation	Information
1	Believe in your own abilities	4	306	9,56	59,77%	Most of the
2	Act independently in making decisions	3	245	7,66	63,80%	Most of the
3	Have a positive self-concept	3	305	9,53	79,43%	Almost All of It
4	Dare to express your opinion	5	480	15,00	75,00%	Almost All of It
Total		15	1336	41,75	69,58%	Most of the

Based on the results of data processing, the total score of students' self-confidence was 1,336 out of a maximum score of 1,920. The overall mean value was 41.75 with a percentage of 69.58%, so the level of student self-confidence in learning mathematics was in the majority category. This indicates that in general, students have quite good self-confidence, but there are still several aspects that need to be improved to achieve the overall category evenly. The results of the self-confidence scale percentageStudents' mathematical (self-confidence) can be seen in the following visual statistics diagram:

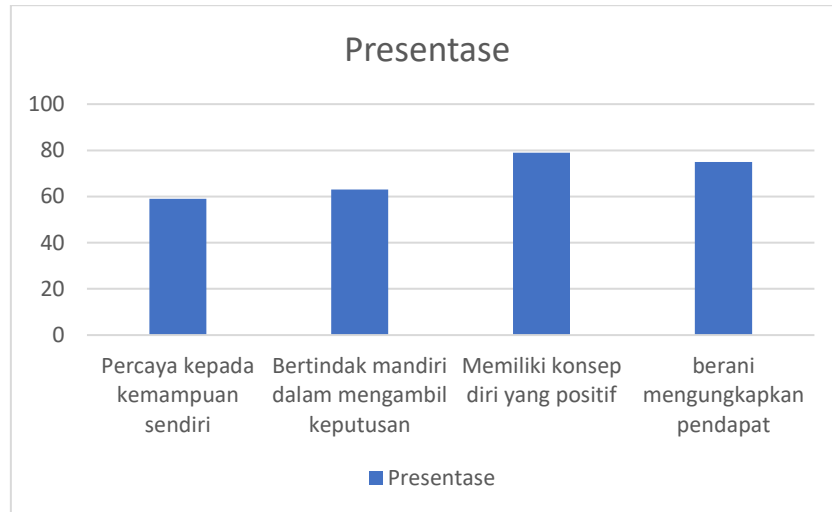


Figure 1.Percentage of students' mathematical self-confidence scale

These findings indicate the need for learning strategies that place greater emphasis on providing opportunities for students to practice making decisions independently, performing in front of the class, and gaining positive learning experiences so that students' self-confidence can increase optimally.

In this study, the results of the questionnaire/survey show that most students have a fairly good level of self-confidence in learning mathematics. This can be seen from the attitude of students who believe in their own abilities, are able to make decisions independently in the learning process, have a positive view of themselves, and dare to express opinions when participating in mathematics learning in class. Furthermore, the data from the questionnaire/survey results obtained from the answers of 32 students include answers Strongly Agree (SS), Agree (S), Disagree (TS), and Strongly Disagree (STS). The results of the analysis are arranged based on each indicator of self-confidence as follows:

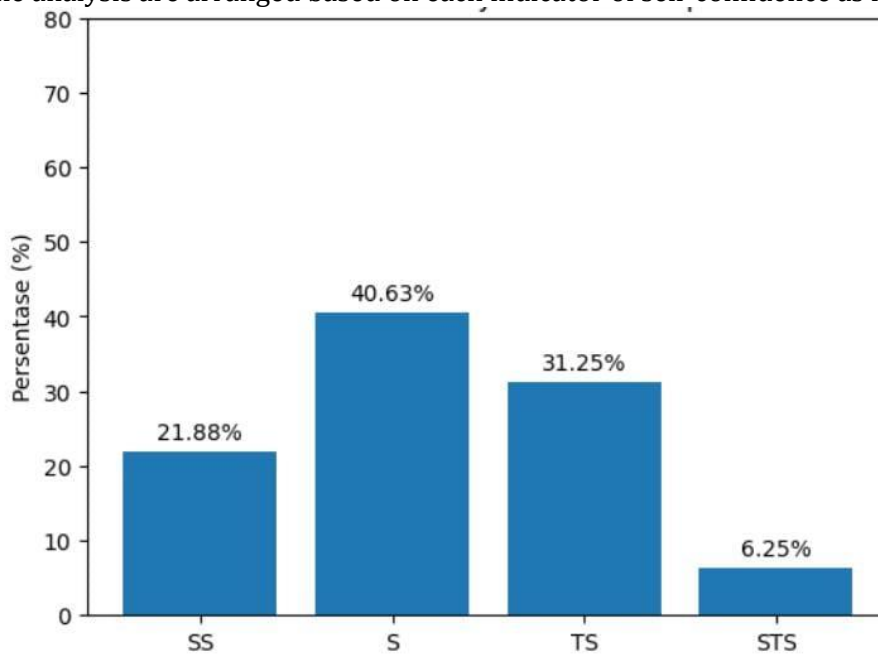


Figure 2.Confidence in one's own abilities

Analysis of the questionnaire results on the self-confidence indicator showed that most students were confident in their abilities to face mathematics learning. Students tended to believe they were capable of solving problems, understanding the material, completing assignments, and facing challenges in mathematics learning without fear. This is in line with (Fardani and Surya 2018) who argues that self-confidence can encourage students to have motivation and success in understanding, finding, and

fighting for the mathematics learning problems given until they find the expected solution. However, it was still found that students chose the categories of disagree and strongly disagree, which shows that there are some students who do not yet have optimal self-confidence in facing mathematics learning.

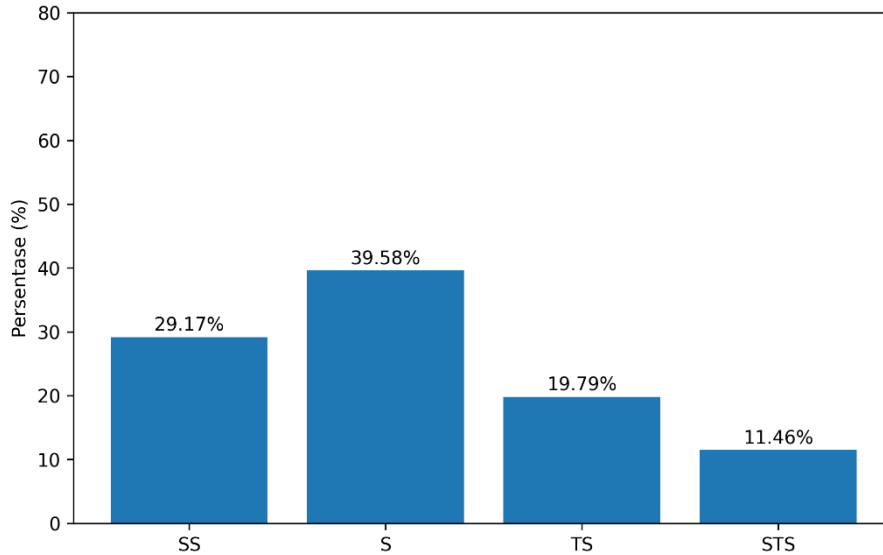


Figure 3.Independence in decision making

Analysis of the results of the student questionnaire based on indicators of independent action in making decisions in learning mathematics. Based on the results of the questionnaire on the indicator, most students act independently in making decisions when learning mathematics. Therefore, by having an attitude of acting independently in making decisions, students will be able to make decisions that are carried out by themselves without the help of others. One of the students who has self-confidence will be able to act in making decisions for themselves that are carried out independently without the help of others and are able to trust the actions that have been taken. In this analysis, it shows that students are able to make decisions as a form of independence in acting accompanied by no coercion or orders and desires from others.

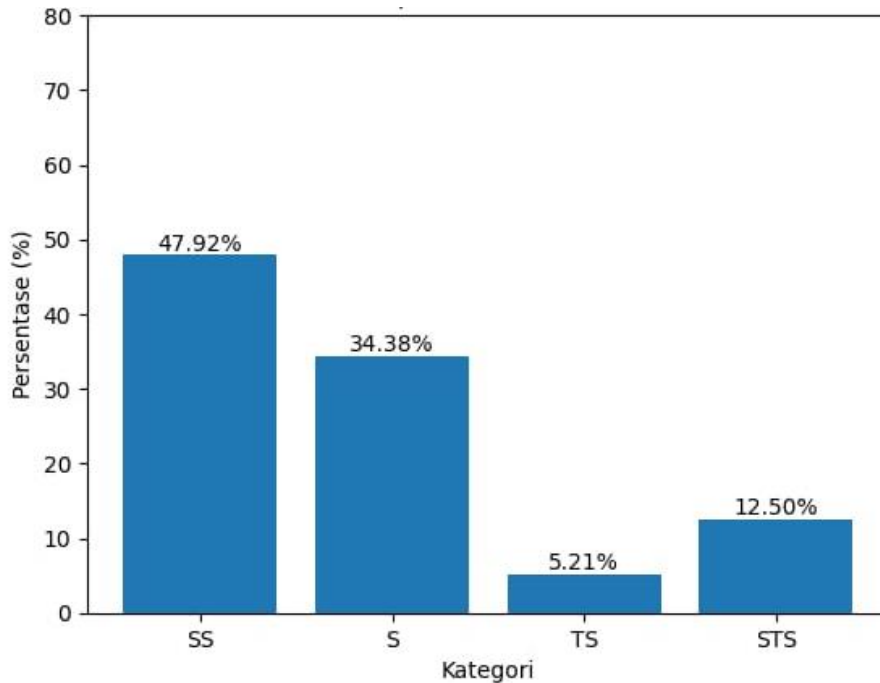


Figure 4. Have a positive self-concept

Analysis of the questionnaire results on the indicator of having a positive self-concept, obtained the majority of students have a positive self-concept in learning mathematics. This indicates that students view themselves positively in the sense of believing they are able to follow mathematics learning well, do not give up easily, and have confidence that the efforts made can produce good results. This is in line with the opinion of (Haque et al. 2022) which states that a positive self-concept will encourage students to have high self-confidence, believe in their abilities, and dare to face challenges. Therefore, students with a positive self-concept tend to be more confident, active, and persistent in learning mathematics. However, some students still responded with disagree and strongly disagree responses, indicating that some students still have a less positive self-concept in learning mathematics.

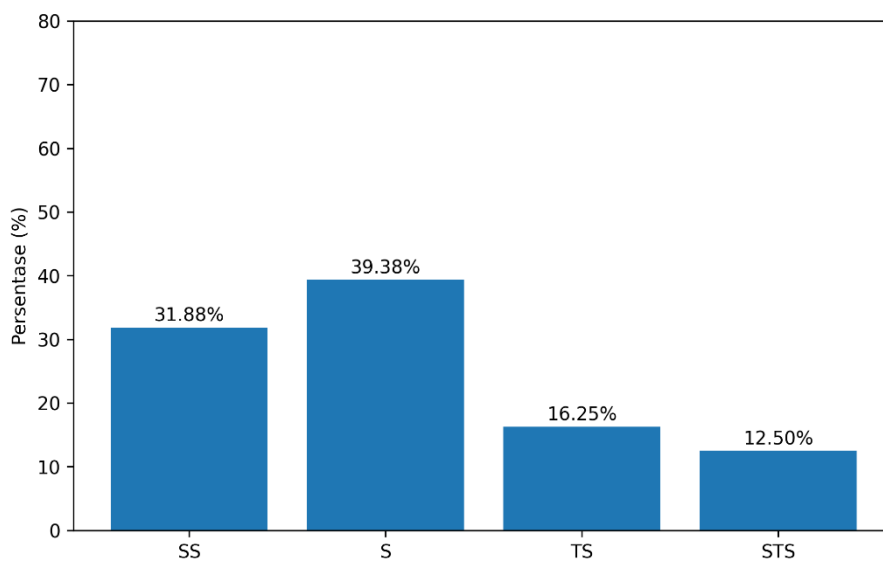


Figure 5. Courage in expressing opinions

Analysis of the results of the student questionnaire based on the indicator of courage to express opinions in learning mathematics. Based on the results of the questionnaire on this indicator, most students dare to express their opinions in learning mathematics. Therefore, by daring to express their opinions, students will have the courage to ask teachers about the mathematics problems being studied. The actions of students who are brave in making decisions that are carried out independently in expressing opinions are the right steps for themselves. One of the students who has self-confidence will be able to act in making decisions for themselves that are carried out independently without assistance from others and are able to trust the actions that have been taken. In this analysis, it shows that students are able to express their own opinions boldly without coercion or orders or desires from others.

CONCLUSION

Based on the research results, it can be concluded that the level of student self-confidence in learning mathematics is quite good. This is evident from the percentage of student responses on each self-confidence indicator, which shows a value above half of the assessment scale. The indicator of having a positive self-concept shows a relatively lower percentage, but still in the sufficient category. This finding indicates that most students have a positive attitude towards themselves in learning mathematics, although not yet fully evenly distributed across all aspects of self-confidence. The percentages for each indicator reflect students' learning experiences in class. Students tend to more easily build a positive self-concept, but still need encouragement in terms of confidence in their abilities and courage in expressing opinions. Thus, the difference in percentages of the four indicators indicates that the development of students' mathematics self-confidence is not formed evenly.

Although the results of this study indicate self-confidence (*self-confidence*) While students' mathematics learning performance is in the fairly good category, this study still has limitations. The study was conducted on a limited sample size, so the results cannot be generalized comprehensively. Therefore, further research is recommended to involve a larger sample size and a wider range of schools to obtain a more comprehensive picture. Furthermore, future researchers can also link self-confidence with students' learning outcomes or motivation to learn mathematics.

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