

THE RELATIONSHIP BETWEEN SELF-CONFIDENCE, LEARNING STYLES, AND MATHEMATICS ACHIEVEMENT AMONG 10TH-GRADE STUDENTS IN THE HOTEL ACCOMMODATION PROGRAM AT SMK TUNAS WISATA

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Abstract

Keywords:

*Self-Confidence,
Learning Styles,
Mathematics Achievement,
Descriptive Statistical
Analysis*

This study analyzes the relationship between self-confidence, learning styles, and mathematics achievement among 10th-grade students in the Hospitality and Accommodation program at SMK Tunas Wisata. Using a quantitative method involving descriptive statistical analysis and multiple correlation analysis, data were collected via questionnaires. The results indicate that self-efficacy and learning styles account for 23.24% of mathematics achievement, while 76.76% is influenced by other factors. The conclusion is that improving mathematics achievement requires attention to self-efficacy, learning styles, and other external factors. Recommendations include developing programs to enhance self-confidence, adjusting teaching methods, improving the quality of instruction, and providing support from families and the community.

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INTRODUCTION

Education is a vital foundation for developing high-quality and competitive human resources. In this context, vocational education, such as that offered at Tunas Wisata Vocational High School (SMK), plays a strategic role in preparing a skilled and ready-to-work workforce that meets industry needs. One of the promising programs at SMK Tunas Wisata is Hospitality Accommodation, which requires mastery of various skills, including mathematical abilities that support operations in the hospitality sector. The introduction must be clear and outline the author's rationale for writing this article, including field observations, existing theories or regulations, and the reasons why this topic is worth researching. At the end of the introduction, briefly and clearly state the research problem and the benefits of the study.

Mathematics, as one of the core subjects, plays a crucial role in shaping students' logical



and analytical thinking. However, in reality, many students struggle to achieve satisfactory learning outcomes in mathematics. Various factors can influence mathematics learning outcomes. Among these are students' self-confidence and learning styles. Learning style refers to the approach students use to process information when completing academic tasks. There are various types of learning styles, such as visual, auditory, and kinesthetic, each of which has its own advantages.

Self-confidence is an individual's belief in their own ability to achieve academic goals. High self-confidence can boost students' motivation and courage in facing academic challenges, including in learning mathematics. Conversely, low self-confidence often acts as a barrier that hinders students from reaching their full potential.

This study aims to explore the relationship between self-confidence, learning styles, and mathematics learning outcomes among 10th-grade students majoring in Hospitality Accommodation at SMK Tunas Wisata. A deeper understanding of more effective and adaptive learning strategies is sought. By tailoring teaching methods to students' learning styles and strengthening their self-confidence, it is hoped that mathematics learning outcomes can be improved. Through this study, it is also hoped that various educational interventions can be identified and implemented to support students' learning success. Thus, this study is not only beneficial for improving mathematics learning outcomes but also contributes to creating a learning environment that supports students' holistic self-development and competency. This study is also expected to contribute to the development of a curriculum and teaching methods that are more adaptive to students' needs, thereby producing graduates who are competent and ready to compete in the hospitality industry.

LITERATURE REVIEW

Mathematics learning outcomes serve as an indicator of students' success in mastering concepts, thinking logically, and solving problems following the learning process. As a subject often perceived as abstract and challenging, these outcomes are influenced not only by cognitive factors but also by students' internal variables, namely *self-confidence* and learning styles. Self-confidence is an individual's belief in their ability to overcome academic challenges. In mathematics, students with high self-confidence tend to demonstrate strong perseverance, are willing to explore problem-solving strategies, and do not easily give up when encountering conceptual errors.

In addition to mindset, the effectiveness of learning depends heavily on students' learning styles—whether visual, auditory, or kinesthetic—which determine how individuals process information optimally. Simultaneously, self-confidence and learning style are strongly believed to make significant contributions to mathematics learning outcomes. Learning style functions as a modality or “pathway” that helps students understand abstract material, while self-confidence acts as an internal motivator that maintains mental stability during the problem-solving process. It is this synergy between a suitable learning style and high self-confidence that, in theory, can optimize students' mathematics learning outcomes.

RESEARCH METHOD

This study employs a quantitative descriptive method using a multiple regression analysis approach. The objective of this study is to identify the relationship between self-confidence, learning styles, and mathematics learning outcomes among 10th-grade students majoring in Hospitality Accommodation at SMK Tunas Wisata.

1. Population and Sample

The population in this study consists of all 10th-grade students in the Hospitality Accommodation program at Tunas Wisata Vocational High School, totaling 30 students. The sampling technique used was *purposive sampling*, which involves selecting a sample based on specific criteria relevant to the research objectives. In this case, the selected sample comprised students who had taken the Mid-Semester Assessment and completed the questionnaires on learning styles and self-confidence.

2. Research Instruments

- a) Self-Confidence Questionnaire: This instrument is used to assess students' levels of self-confidence in an academic context, specifically in mathematics. The questionnaire consists of 30 items covering aspects of self-confidence in tackling mathematical tasks and perceptions of one's own abilities.
- b) Learning Style Questionnaire: This instrument is used to identify students' learning styles. The questionnaire consists of 30 items that describe various aspects of visual, auditory, and kinesthetic learning styles. Respondents are asked to rate each statement according to how often they feel it applies to them.

3. Research Procedure

a) Data Collection

- Self-Confidence and Learning Style Questionnaires: The questionnaires were distributed to students to be completed. Before completing them, students were given an explanation of the research objectives and how to fill out the questionnaires.
- Midterm Assessment Results: The midterm assessments were conducted at a time aligned with the school's academic calendar. The midterm assessment results were obtained from the teachers.

b) Data Analysis

Data from the questionnaires and mid-semester assessment results were collected and analyzed using descriptive statistics and multiple regression analysis. Descriptive statistics were used to describe the distribution of students' learning styles and self-confidence. Meanwhile, multiple regression analysis was used to identify the relationship between learning style, self-confidence, and mathematics achievement.

c) Data Analysis

- Descriptive Statistical Analysis: This includes calculating the mean, median, mode, and standard deviation for each variable.
- Multiple Correlation Analysis: Used to test the relationship between learning styles and mathematics achievement, as well as between self-confidence and mathematics achievement.

d) Interpretation of Results

The results of the data analysis were interpreted to determine the extent to which learning styles and self-confidence influence students' mathematics learning outcomes. This interpretation was then used to formulate recommendations for improving learning strategies.

4. Validity and Reliability

To ensure the validity and reliability of the research instruments, a pilot test of the questionnaire and midterm assessment results was conducted on 30 students who were not included in the research sample.

RESULTS AND DISCUSSION

1.1 Research Results

Based on the results of descriptive statistical analysis and multiple correlation analysis, the following findings were obtained:

Table1 Results of Descriptive Statistical Analysis of Self-Confidence

STATISTICS	VARIABLE
Sample size	30
Mean	100.8
Standard Deviation	12.90

Liliefors Normality Test

Liliefors Calculated	0.066
Confidence Level	0.05
Liliefors Table	0.161
Conclusion	Normal

The results in Table 1 indicate that self-confidence influences students' mathematics learning outcomes, as supported by the normality test. Based on the results of the Liliefors normality test conducted at a 0.05 confidence level, the calculated Liliefors value (L_h) was 0.066. This value was then compared with the critical value from the Liliefors table (L_t), which is 0.161.

In this normality test, the null hypothesis (H_0) states that the data come from a normal distribution, while the alternative hypothesis (H_1) states that the data do not come from a normal distribution. The decision criterion used is that if the calculated Liliefors value (L_h) is less than or equal to the table Liliefors value (L_t), then we accept the null hypothesis (H_0). The comparison results show that $L_{Hitung} < L_{Tabel}$, or $0.066 < 0.161$. Therefore, the null hypothesis (H_0) is accepted. This means that the tested data are normally distributed.

Table2 Results of Descriptive Statistical Analysis of Learning Styles

STATISTICS	VARIABLE
Sample Size	30
Mean	111.43
Standard Deviation	11.79

Liliefors Normality Test

Liliefors Calculated	0.146
Confidence Level	0.05
Liliefors Table	0.161
Conclusion	Normal

Based on Table 2, the results of the normality test conducted at a 0.05 confidence level show a calculated Liliefors value (L_h) of 0.146. This value was then compared to the critical value from the Liliefors table (L_t) of 0.161.

In this normality test, the null hypothesis (H_0) states that the data come from a normal distribution, while the alternative hypothesis (H_1) states that the data do not come from a

normal distribution. The decision criterion used is that if the calculated Liliefors value (L_h) is less than or equal to the table Liliefors value (L_t), then we accept the null hypothesis (H_0).

The comparison results show that $L_{Hitung} < L_{Tabel}$, or $0.146 < 0.161$. Therefore, the null hypothesis (H_0) is accepted. This means that the data being tested is normally distributed. In other words, the learning style data analyzed is normally distributed.

Table3: Mathematics Learning Outcomes

STATISTICS	VARIABLE
Sample Size	30
Mean	60.87
Standard Deviation	44.32

Liliefors Normality Test

Liliefors Calculated	0.155
Confidence Level	0.05
Liliefors Table	0.161
Conclusion	Normal

Based on Table 3, the results of the normality test conducted at a confidence level of 0.05 show a calculated Liliefors value (L_h) of 0.155. This value was then compared to the critical value from the Liliefors table (L_t) of 0.161.

In this normality test, the null hypothesis (H_0) states that the data come from a normal distribution, while the alternative hypothesis (H_1) states that the data do not come from a normal distribution. The decision criterion used is that if the calculated Liliefors value (L_h) is less than or equal to the table Liliefors value (L_t), then we accept the null hypothesis (H_0).

The comparison results show that $L_{Hitung} < L_{Tabel}$, or $0.155 < 0.161$. Therefore, the null hypothesis (H_0) is accepted. This means that the tested data are normally distributed. In other words, the students' mathematics achievement data analyzed are normally distributed.

Table 4 Results of the Multiple Correlation Analysis of Self-Confidence and Learning Styles on Mathematics Achievement

ry1	-0.464130015	-0.4641
ry2	-0.099179747	-0.0991
r12	0.463177278	0.4631
Ry12	0.4821	0.4821

Based on the results in Table 4, the variable " X_1 " shows a negative relationship with Y. This means that in this study, as the value of " X_1 " increases, mathematics learning outcomes tend to decrease. Meanwhile, the variable " X_2 " shows a relationship with Y and also influences the variation in students' learning outcomes. Collectively, " X_1 " and " X_2 " also have a relationship with Y, so both variables continue to play a role in explaining mathematics learning outcomes. Thus, the results of this study indicate that the relationships between variables should not only be viewed individually but also simultaneously through a combined

model.

$$\begin{aligned}
 F_{hitung} &= \frac{R^2/k}{(1 - R^2)/(n - k - 1)} \\
 &= \frac{(0,4821)^2/2}{(1 - (0,4821^2))/(30 - 2 - 1)} \\
 &= \frac{0,2324/2}{1 - 0,2324/27} \\
 &= \frac{0,1162}{0,0284}
 \end{aligned}$$

$$F_{calculated} = 4.09$$

Based on the calculation of the $F_{hitung} > F_{tabel}$, or $4.09 > 3.35$, there is a correlation between self-confidence and learning style on student learning outcomes, with a contribution of 23.24%, while the remaining 76.76% is determined by other factors.

Table 5 Results of the Learning Style Analysis

$$Visual = \frac{161}{180} \times 100\% = 89,44\%$$

$$Auditori = \frac{159}{180} \times 100\% = 88,33\%$$

$$Kinestetik = \frac{365}{390} \times 100\% = 94,62\%$$

$$Mandiri = \frac{168}{180} \times 100\% = 93,2\%$$

Based on the results of the analysis of students' learning styles, the percentage of visual learners was 89.44%, auditory learners 88.33%, kinesthetic learners 94.62%, and independent learners 93.20%. Of these results, the highest percentage was found in the kinesthetic learning style, at 94.62%. This indicates that most students tend to understand material more easily through activities involving practice, movement, or direct experience.

1.2 Discussion

The results of this study show that self-confidence and learning styles have a significant but limited influence on students' mathematics learning outcomes. Students with high levels of self-confidence tend to be more confident when facing mathematics tasks, which can increase their motivation and effort in learning. This is consistent with Bandura's theory of self-efficacy, which states that an individual's self-confidence influences how they think and behave.

High self-confidence makes students feel more capable of overcoming academic challenges, including understanding complex mathematical concepts. They remain persistent when facing difficulties, try various problem-solving strategies, and do not give up easily. This positive attitude is crucial in subjects like mathematics, which are often perceived as difficult by many students.

In addition, learning styles play an important role in the learning process. Visual, auditory, kinesthetic, and independent learning styles each provide different ways for students to absorb and understand information. However, based on the learning style results obtained from 10th-grade students in the Hospitality Accommodation Department at SMK Tunas Wisata, 94.62% of them showed an interest in the kinesthetic learning style. The kinesthetic learning style involves physical activities or experiments—commonly known as hands-on practice. In fact, the kinesthetic learning style is frequently employed in vocational high school teaching methods.

However, although self-confidence and learning style contribute significantly, the combined contribution of these two variables is only 23.24%. This indicates that there are many other factors influencing mathematics learning outcomes. Some other factors that may influence these outcomes include teaching methods, teaching quality, the learning environment, family support, emotional state, and socioeconomic status.

From the results of this study, it can be concluded that self-efficacy and learning style contribute 23.24% to the mathematics learning outcomes of 10th-grade students majoring in Hotel Accommodation at SMK Tunas Wisata. Meanwhile, 76.76% of the variation in mathematics learning outcomes is influenced by other factors not examined in this study. This indicates that efforts to improve mathematics learning outcomes do not solely depend on enhancing learning confidence and adjusting learning styles but also require attention to other external factors.

CONCLUSION

Based on the results of this study, it can be concluded that learning confidence and learning style contribute 23.24% to the mathematics learning outcomes of 10th-grade students majoring in Hotel Accommodation at SMK Tunas Wisata. Meanwhile, 76.76% of the variation in mathematics learning outcomes is influenced by other factors not examined in this study. This indicates that efforts to improve mathematics learning outcomes do not solely depend on enhancing learning confidence and adjusting learning styles but also require attention to other external factors.

Recommendations

1. Schools can develop programs aimed at boosting students' self-confidence in learning, such as motivational training and learning strategies.
2. Teachers can adapt their teaching methods to students' various learning styles to help them better understand the subject matter.
3. Improving the quality of instruction and creating a supportive learning environment are also crucial for enhancing students' learning outcomes.
4. Providing emotional and social support to students through the involvement of families and the community can help improve their learning outcomes.

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