Jurnal Theorems (*The Original Reasearch Of Mathematics*)
Volume 9, Nomor 2, Januari 2025
URL: http://ejournal.unma.ac.id/index.php/th

e-ISSN: 2528-102X
p-ISSN: 2541-4321

ANALYSIS OF THE INFLUENCE OF LEARNING STYLES ON MATHEMATICS LEARNING OUTCOMES IN JUNIOR HIGH SCHOOL IN ACEH JAYA REGENCY

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Article Info:
Received 2024-12-01
Revised 2024-12-07
Accepted 2025-01-03

How to Cite:
Mursalina., Anzora., & Rahmi. (2025). Analysis Of The Influence Of Learning Styles On Mathematics Learning Outcomes In Junior High School In Aceh Jaya Regency. *Jurnal Theorems (The Original Research of Mathematics*, *9*(2), 310-318.

ABSTRACT

The purpose of this research is: To determine the effect of learning styles on students' learning outcomes in mathematics education at the junior high school level in Krueng Sabee District, Aceh Jaya Regency. This type of research is quantitative. This quantitative research can be conducted through correlational, experimental, or descriptive studies (Deni Dermawan, 2013). This study is a correlational quantitative research that involves a variable related to another variable. Correlation here is a number that indicates the direction and strength of the relationship between two or more variables; direction can be interpreted as a positive or negative relationship, and the strength of the relationship can be interpreted by its correlation coefficient. It can be understood that correlational quantitative research is conducted to find the influence of two variables being studied and then determine how strong their relationship is. Learning outcomes are not solely based on grades; rather, the results depend on what is learned. The results of the study on the influence of learning styles on the mathematics learning outcomes of junior high school students in Aceh Jaya show that among visual, auditory, and kinesthetic learning styles, the dominant style possessed by students is kinesthetic learning. This is evidenced by the questionnaire results distributed by the author, which indicate that the percentage of visual learning style is 29.2% with 18 students, auditory learning style is 24.1% with 15 students, and kinesthetic learning style is 32.2% with 20 students. The hypothesis test result show that pearson's correlation between learning styles and learning outcomes is 0,159 with a significance value of 0,218. Since the the significance value is greater than 0,05, it indicates an insignificant effect; thus , it can be concluded that: a. Ha is rejected; there is no effect of learning style on the mathematics learning outcomes of junior high school student in krueng sabee district, aceh jaya regency. b. Ho is accepted; there is no effect of learning styles on the mathematics learning outcomes of junior high school students in Krueng Sabee District, Aceh Jaya Regency. The study indicates that learning styles do not significantly influence students' mathematics learning outcomes. The correlation test results show an insignificant value between learning styles and learning outcomes (significance value 0.218 greater than 0.05). With a very small contribution effect of only 2.5%, it means there is no influence of learning style (X) on learning outcomes (Y).

Keywords: Learning Styles, Learning Outcomes

e-ISSN: 2528-102X
p-ISSN: 2541-4321

INTRODUCTION

Education is a crucial aspect of human life. It is an effort to nurture and develop the potentials inherent in individuals. Through education, people undergo a process of guidance, training, and self-direction to escape or avoid ignorance and misinformation. In the educational process, learning occurs when educators and learners engage in two-way communication. The occurrence of learning is a process where educators implement teaching in the classroom, and this teaching process certainly has specific goals to achieve (Pardede et al., 2021).

In today's educational landscape, we are confronted with more complex issues where quality human resources capable of facing the challenges of the times are essential for survival. In reality, all fields of knowledge and sectors of life continually present us with problems that require mathematics as a solution (Sarfa Wassahua, 2016).

Learning styles are the easiest ways individuals have to absorb, organize, and process the information they receive. An appropriate learning style is the key to student success in learning. By recognizing this, students are able to absorb and process information, making learning easier with their own learning style. Limiting the use of learning styles to just one form, especially verbal or auditory methods, can lead to an imbalance in absorbing information. Therefore, in learning activities, students need to be assisted and guided in recognizing the learning styles that suit them so that learning objectives can be achieved effectively (Rambe & Yarni, 2019).

There are three modalities (types) in learning styles: visual, auditory, and kinesthetic (Deporter & Hernacki, 2000). Many other experts categorize learning styles based on cognitive preferences, intelligence profiles, and sensory preferences. In this study, sensory preferences are used, specifically visual, auditory, and kinesthetic learning styles. The reason for using sensory preferences is that during the learning process, students can be observed through their senses. According to sensory preferences, visual learners learn through what they see, auditory learners learn by listening, and kinesthetic learners learn through movement, working, and touching. Every student possesses all three learning styles; however, one style usually dominates. Learning achievement is a final assessment of the processes and experiences that have been repeated over time and will be retained for a long duration because learning outcomes contribute to shaping an individual's character, who always strives to achieve better results, thereby changing their way of thinking and producing better work behavior (Hamalih, 2001).

Based on the observations made during the learning activities at school, several issues have emerged, including low student engagement in mathematics lessons, a mismatch between students' learning styles and their abilities, and students experiencing difficulties in following lessons, which ultimately impacts their learning outcomes. Students often struggle to align their learning methods with the teaching style of teachers who still use traditional methods such as lectures and rely solely on textbooks as learning resources. As a result, when teachers use lecture methods, some students listen

e-ISSN: 2528-102X
p-ISSN: 2541-4321

while others do not, become distracted, or even wander around. From these observations, the author contemplates the significant impact that learning styles have on students' learning outcomes. Although this has not yet been empirically tested, theoretically, learning styles play an important role in relation to learning outcomes.

Every human has different ways of absorbing and processing the information they receive, which is closely related to each individual's learning style. Learning styles are the easiest methods individuals have to absorb, organize, and process the information received. An appropriate learning style is the key to student success in learning (Bire, 2014:169).Students' learning outcomes are influenced by several factors. According to Ruseffendi (as cited in Sutrisno, 2013), there are two factors that can affect learning outcomes:

a) **Internal Factors**, which include:

1. Child's intelligence
2. Child's readiness (mental development is prepared and prerequisite knowledge has been acquired)
3. Child's talent
4. Willingness to learn
5. Interest in learning.

b) **External Factors** that can influence students' learning outcomes include:

1. The model of material presentation
2. The personality and attitude of the teacher
3. The teaching environment
4. Teacher competence
5. Conditions of the external community

This research aims to determine how the learning styles of secondary school students in Bandung manifest, whether there are students who have only one dominant learning style, which learning style is most prevalent among the students in this study, whether more students possess more than one dominant learning style, and if there are students who do not have any dominant learning style at all. This research is important because previous studies have shown that students' learning styles influence their learning outcomes (Apipah, 2017; Syukur & Misu, 2016; Ovez, 2016; Nurhidayah, 2015; Wilson, 2012; Jhaish, 2010). Furthermore, Syukur and Misu (2016) found that students with more than one dominant learning style achieve better learning outcomes than those who only have one dominant learning style.The results of this study are expected to contribute to secondary school teachers in determining the teaching strategies they will use because learning styles significantly affect the interaction between how students learn and how teachers teach (Zuberu, 2019). Additionally, it will be beneficial for future researchers in investigating the influence of learning styles on learning outcomes.

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METHODS

This type of research is quantitative research. Quantitative research is conducted using data in the form of numbers as tools for analysis to find results from what has been studied. This quantitative research can be carried out through correlational, experimental, or descriptive studies (Deni Dermawan, 2013).

The population in this study consists of all seventh-grade students in Aceh Jaya Regency. This selection is made because

a. **Uniform Characteristics**: Seventh-grade students have the same age and education level, making analysis easier.

b. **Representativeness**: Selecting all students provides a comprehensive picture of the educational conditions in the area.Purposive sampling is a technique for selecting data source samples based on certain considerations (Sutrisno et al., 2022). These specific considerations are based on the guidance of the mathematics subject teacher.Data collection methods are techniques or ways that researchers can use to gather data, whether quantitative or qualitative (Riduwan, 2014). The techniques used during data collection include:

1. **Questionnaire**: The researcher distributes a questionnaire containing written questions to respondents. The questionnaire can consist of open or closed questions, allowing for efficient data collection from many respondents.
2. **Observation**: The researcher conducts direct observations of phenomena or behaviors occurring in the field.
3. **Documentation**: Data is also obtained from written sources such as reports, archives, or other documents relevant to the research.

The validity of the instruments in this study is measured by ensuring that the questionnaires and observation tools are systematically designed and aligned with the research objectives. Validity testing is conducted through validity and reliability tests.

FINDINGS

To determine the learning styles of students, a treatment was given by distributing a questionnaire to each student. Based on the students' answers while filling out the questionnaire, the classification of students' learning styles was determined from the highest scores of each student in each sub-variable. For example, if Student A obtained a score of 26 in visual, 20 in auditory, and 22 in kinesthetic, then Student A can be classified as having a visual learning style.The number of students classified as using the visual learning style is 18, those using the auditory learning style is 15, and those using the kinesthetic learning style is 20. This data is presented in Table 1 below.

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Table 1. This is Description of Learning Style Data Results

Learning style	Amount
Visual	18
Auditory	15
Kinesthetic	20
Visual and Kinesthetic	2
Auditori and Kinesthetic	3
Visual and Auditory	4
Total	62

Next, based on Table 1, the percentage calculations for each learning style are made. The following presents the method for calculating the percentages of learning styles of junior high school students in Krueng Sabee:

- **Percentage of visual learning style** = 1853×100%=33.96%5318×100%=33.96% rounded to 34%
- **Percentage of auditory learning style** = 1553×100%=28.30%5315×100%=28.30% rounded to 28%
- **Percentage of kinesthetic learning style** = 2053×100%=37.73%5320×100%=37.73% rounded to 38%

Table 2. This is Results of Normality Test for Learning Styles

Calculation of Survey Data				KET
	V	A	K	
Learning style	0.200	0,200	0,200	Normally Distributed

Based on the table above, the results of the normality test show a significance value of 0.200 > 0.05, thus it can be concluded that the results of the learning style questionnaire data are normally distributed. Based on the results of the linearity test, the following results were obtained:

Table 3. Results of the Learning Style Linearity Test

Variabel	N	*Sig. deviation linearity*	a
Visual Learning Styles and Learning Outcomes	72	0,572	0,05

e-ISSN: 2528-102X
p-ISSN: 2541-4321

Auditory Learning Styles and Learning Outcomes	72	0,889	0,05
Kinesthetic Learning Styles and Learning Outcomes	72	0,257	0,05

Based on the table above, the results of the linearity test indicate that the independent variables—visual, auditory, and kinesthetic learning styles—have a linear relationship with the dependent variable. The significance value of deviation from linearity for the visual learning style is 0.572 > α = 0.05. Additionally, the significance value of deviation from linearity for the auditory learning style is 0.844 > α = 0.05, and for the kinesthetic learning style, it is 0.257 > α = 0.05. Based on the results of the multicollinearity test, the following findings were obtained:

Table 4. Multicollinearity Test Results

Independent Variable	Tolerance	VIF	KET
Visual	0,744	1,344	Multicollinearity Free
Auditory	0,891	1,122	Multicollinearity Free
Kinesthetic	0,823	0,823	Multicollinearity Free

Based on the table above, the results of the multicollinearity test show that the three variables—visual, auditory, and kinesthetic learning styles—are free from multicollinearity. This is evidenced by the tolerance value for the visual learning style of 0.744 > 0.10 and a VIF value of 1.344 < 10. Similarly, the tolerance value for the auditory learning style is 0.891 > 0.10, with a VIF value of 1.122 < 10. Lastly, the tolerance value for the kinesthetic learning style is 0.823 > 0.10, and the VIF value is 1.215 < 10. Based on the hypothesis test results, the following findings were obtained:

Table 5. Regression Test Results

Independen Variabel	F_{hitung}	Sig	R_{square}	R	KET
Visual	0,962	0,331	0,016	0,126	There is no influence.

e-ISSN: 2528-102X
p-ISSN: 2541-4321

Auditory	0,251	0,681	0,004	0,065	There is no influence.
Kinesthetic	1,134	0,291	0,019	0,136	There is no influence.

From the table above, it can be observed that the calculated F-value for the visual learning style is 0.962 with a significance level of 0.331 > 0.05, indicating that there is no influence of learning style (X) on learning outcomes (Y).

Similarly, the calculated F-value for the auditory learning style is **0.251** with a significance level of **0.618 > 0.05**, meaning there is no influence of learning style (X) on learning outcomes (Y).

Finally, the calculated F-value for the kinesthetic learning style is **1.134** with a significance level of **0.291 > 0.05**, also showing no influence of learning style (X) on learning outcomes (Y). By recognizing and applying learning strategies that align with each individual learning style, teachers can make a significant contribution to the academic development of their students. Implementing strategies that are oriented toward individual learning styles will not only enhance students' motivation to learn but also strengthen their ability to understand and apply the knowledge they acquire.

CONCLUSION

The Learning Styles and Learning Outcomes: Students' learning styles vary, with the kinesthetic learning style being the most dominant among junior high school students in Aceh Jaya. The research indicates that learning styles do not influence students' mathematics learning outcomes.

The results of a simple linear regression test show that the F-value for learning styles is 1.550, with a significance level of 0.218 > 0.05, indicating a very small contribution of 2.5%. This means there is no effect of learning styles (X) on learning outcomes (Y).

SUGGESTION

Advice for Teachers:

Personalize Learning: Identify each student's learning style and adjust teaching methods to be more effective, such as using visual aids for visual learners or conducting practical activities for kinesthetic learners.

Variety in Teaching Methods: Implement various teaching strategies to encompass different learning styles. For example, combine lectures with group activities or experiments.

e-ISSN: 2528-102X
p-ISSN: 2541-4321

Suggestions for Researchers:

Further Research: Conduct further studies to explore the relationship between learning styles and learning outcomes across various subjects and educational contexts. This will help provide a more comprehensive picture.

Additional Variables: Consider including additional variables that may influence learning outcomes, such as motivation, metacognitive skills, or the learning environment.

Advice for Readers:

Understand Learning Styles: Recognize each individual's learning style and how it can affect the learning process and outcomes. This is important for students, parents, and educators alike.

Support Diverse Approaches: Support the use of various teaching methods and strategies that align with students' learning styles to achieve better educational outcomes.

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