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The Relationship between Students' Learning Styles and Mathematic Learning Outcomes

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Abstract

Every student has a different learning style. The aim of this research is to obtain empirical data about the relationship between student learning styles and learning outcomes in class VII set material at SMPN 05 Cibarusah, Bekasi Regency. This research uses a quantitative approach through correlational techniques and documentation survey methods. The population of this study were all class VII students of SMPN 05 Cibarusah, Bekasi Regency, with a sample of 30 students obtained through random sampling techniques. Data collection used a questionnaire for the learning style variable (X) and a multiple choice test for the mathematics learning outcomes variable subject set (Y). The results of the study showed that there was a positive correlation between Learning Styles (Variable X) and Student Learning Outcomes (Variable Y) in Mathematics Lesson Material for Class VII SMPN 05 Cibarusah, Bekasi Regency.

Keywords: Learning outcomes, Learning styles, Mathematic learning outcomes.

1 INTRODUCTION

Education is an effort made by individuals to acquire knowledge and thinking abilities (Muenks & Miele, 2017). One of the important things in education is not only providing understanding but also being able to provide changes in a person's behavior according to their needs. Most of us learn in many styles and ways. However, there is definitely one way that we really like. Likewise with the students in class. Whatever method is chosen, the differences in learning styles indicate the fastest and best way for each individual to absorb information from outside themselves (Darmayanti et al., 2022; Komala & Afrida, 2020; Ardiyanto, 'Adna, & Chasanah, 2022).

From the results of initial observations in class VII of SMPN 5 Cibarusah, it can be seen that there are still many students who experience difficulties in understanding Mathematics lessons. Based on the results of daily tests and odd mid-semester tests for the 2022/2023 class VII academic year at SMPN 5 Cibarusah obtained by the author through analysis of student data which states that the average student learning outcome score is still low from the KKM, namely 70, while there are still many students who got a score below the KKM, namely with a score of 60 or less than 60. Of the 30 class VII students of SMPN 5 Cibarusah, there were around 33.33% or 10 students who had not been able to solve the mathematics problems on the set material, while there were around 50% or 15 students who were able to reach the KKM score and 5 students around 16.67% who got around the KKM.

This shows that the grades of class VII students at SMPN 5 Cibarusah in mathematics are still low. The low level of success achieved by students is caused by two factors that influence student learning outcomes, namely internal factors (factors that come from within the student) and external factors (factors that come from outside the student). Internal factors that influence student learning outcomes are students' inability to do mathematics problems which is caused by students not applying their own learning styles

(Rigusti, Pujiastuti, & Mutaqin, 2020). Due to ignorance or not being aware of the learning style that suits his potential. During learning activities, each student certainly has a different learning style from one student to another to make it easier for them to absorb, organize and process information known through their five senses (Suharto et al., 2021).

Based on the background above, the author considers it necessary to conduct research and write it in a scientific work with the title "The Relationship between Student Learning Styles and Mathematics Learning Outcomes in Set Material".

2 RESEARCH METHODS

This research is a type of quantitative correlation research, namely a method to determine whether there is a relationship between learning styles and student learning outcomes in set material in class VII SMPN 05 Cibarusah. The data collection method uses a questionnaire method to search for data on learning readiness and the form of questions is used to obtain data on student learning outcomes. The sampling technique used in this research was chosen using a random cluster technique, those selected as the correlation research group were class VII A with a total of 30 students. According to the number of variables studied, researchers used two types of data sources. The data used are scores obtained from a learning style questionnaire with a test of mathematics learning outcomes on the set material that students work on. A questionnaire is a data collection technique that is carried out by giving respondents a set of questions or written statements to answer. The questionnaire used in this research is a closed questionnaire, namely a questionnaire that is equipped with answers so that the respondent just has to choose the answer. Technical data analysis was carried out using regression and correlation tests.

3 RESULT AND DISCUSSION

Based on the results of the analysis, learning style is one that determines student learning outcomes. In this research, learning style has a significant influence on student learning outcomes. Of course, it is not only style that influences student learning outcomes, but there are other factors that have not been observed in this research. Learning style is very important for students because knowing the right learning style in learning can make it easier for students to want to understand learning optimally so that they can obtain the desired results. Of course, if students know their learning style, it will make it easier for students to learn and achieve good success.

The aim of this research is to prove whether there is a relationship between learning styles and mathematics learning outcomes in class VII material at SMPN 5 Cibarusah. The sample in this study was 30 people taken proportionally. Valid testing for variable Meanwhile, for variable Y (mathematics learning outcomes) using the Biserial Correlation (rpbis) formula, of the 30 questions tested it turned out that only 26 questions were valid, reliable, the level of favorability and differential power met the criteria. The reflection analysis test using the Liliefors test concluded that the data was normally distributed. The following is a frequency distribution table for creating histogram and polygon graphs for the variable X (Learning Style).

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Table 1. Variable Frequency Distribution X

Class	Midpoint (X_i)	Frequency (F_i)	$F_i.X_i$	X_i-X	$(X_i$-$X)^2$	F_i $(X_i$-$X)^2$	Real Limit
53 - 58	55,5	2	111	-14	196	392	52,5 - 58,5
59 - 64	61,5	9	553,5	-8	64	576	58,5 - 64,5
65 - 70	67,5	5	337,5	-2	4	20	64,5 - 70,5
71 - 76	73,5	8	588	4	16	128	70,5 - 76,5
77 - 82	79,5	4	318	10	100	400	76,5 - 82,5
83 - 88	85,5	2	171	16	256	512	82,5 - 88,5
Total		30	2079		636	2028	

The calculation results based on the Product moment table with N=30 and a significance level of 5%, show that the rtable value is 0.361 Decision rule: if $r_{count}>r_{table}$ then the question item is declared valid, whereas if $r_{count}<r_{table}$ then the question item is declared invalid. Of the 30 instrument questions, there were 4 questions that were invalid so they had to be discarded, namely question numbers (5, 18, 23 and 26). Thus, the total number of statement items that are ready to be used as scoring material is 26 valid question instruments. Complete calculation data can be seen in Appendix 14 for calculating instrument validity.

The calculation of the mathematics learning outcomes test using the KR-20 method shows that the reliability value obtained is 0.883, so the reliability criteria for this research instrument are included in the "high" category.

Judging from the discriminating power, the items used to measure students' mathematics learning outcomes are items that have sufficient discriminating power, namely with a discriminating power index $r_{pbis}>0.20$. The results of the discrimination index test of the reasoning ability test are presented in Table 2.

Table 2. Result of the discrimination index test of mathematics

Discrimination index criteria	Question Item	Interpretation discrimination index	Number Of Questions
D ≤ 0,00	0	Very Low	0
0,00 ≤ D ≤ 0,20	5,18,23,26	Low	4
0,20 < D ≤ 0,40	1,2,4,6,7,8,10,11,15,17,19,20,21,24,25,27,28,29,30	Average	19
0,40 < D ≤ 0,70	3,9,12,13,14,16,22	High	9
0,70 < D ≤ 1,00	0	Very high	0

Based on Table 2, the results of the calculation of the discrimination index test from 30 items, produced 4 questions whose criteria were poor, 19 sufficient and 9 good, so the questions had a discrimination index≥0.20 even with several interpretations. This means that all of these questions can be used as learning outcomes test instruments

The regression analysis used is simple linear regression, based on the functional relationship between the independent variable (learning style) and the dependent variable (mathematics learning outcomes). The formula used is $Y=a+bX$. The hypothesis proposed is: [H_0]: Y=ɑ+bX (linear regression model); [H_1]: Y≠ɑ+bx (non-linear regression model).

The constant value, a=-24.56, and the direction coefficient b=1.40, so the regression equation is $\hat{Y}$=-24.56+1.40X. To determine the significance of the regression model, variance analysis is used with the test criteria: $F_{count}<F_{table}$, then the data for variable X to Y is linear, and if $F_{count}>F_{table}$, then the data for variable X to Y is not linear. From the calculation results, it is obtained that F_{count}= -0.45 and F_{table}=2.70. Thus -0.45<2.70 or $F_{count}<F_{table}$. Conclusion variable X to variable Y is linear because $F_{count}<F_{table}$. Complete calculations are contained in appendix 30 linearity tests.

The regression significance test was carried out to determine whether the regression equation obtained was significant or not with a significance level of α=0.05. The test statistics use the analysis of variance (Anava) test with the test criteria being to reject H_0 if calculated $F_{count}>F_{table}$ with a significance level of α=0.05. From the test results, it is obtained that F_{count}=679.44 and F_{table}=4.20, so that H_0 is rejected and it can be concluded that the regression model is meaningful.

4 CONCLUSION

Based on the results of research conducted by the author, it can be concluded that there is a significant positive relationship between learning style and mathematics learning outcomes in class VII material at SMP Negeri 5 Cibarusah. The conclusion can be proven by the results of the correlation coefficient test with the product moment formula, obtained rcount of 0.979, then calculated with rtable for n=30 at the 95% confidence interval, namely 0.361, obtained $r_{count}>r_{table}$ (0.979>0.361), t-test results for significance obtained $t_{count}>t_{table}$ (25.273>2.048) which means it makes a significant contribution. The determination test results obtained were 0.958, which means that 95.8% of mathematics learning outcomes in set material are influenced by learning style.

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