

THE RELATIONSHIP BETWEEN STUDENT LEARNING STYLE AND INTENSITY OF MATHEMATICS LEARNING WITH MATHEMATICS LEARNING OUTCOMES IN CLASS VIII

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ABSTRACT

Based on observations and interviews in Junior High School (SMP) Muhammadiyah Piyungan known that students have not known the learning style according to each student and student learns mathematics if the test will be held only. This study aims to determine whether or not a positive and significant relationship between student learning styles and intense mathematics learning with the results of learning Mathematics Students in Class VIII SMP Muhammadiyah Piyungan the second semester in the Year 2017/2018. This study's population was all class VIII students, even semester classes SMP Muhammadiyah Piyungan excellent school year 2017/2018, which consisted of class VIII A, VIII B and VIII C which 69 students in total. The sample was taken with a random sampling technique and derived class VIII A. Technique of data collection is done by using questionnaires to the learning style and intense of mathematic learning. While the result of learning mathematics using test instruments. Test of research instrument includes a validity test, a test of different power, and reliability test. The prerequisite analysis test includes the normality test, linearity test, and independence test. Data analysis using product moment analysis and multiple linear regression analysis. The results showed a positive and significant relationship between students' learning style with the results of learning Mathematics Students in Class VIII grade high school student at SMP Muhammadiyah Piyungan in the second semester in the year of 2017/2018. It is announced by $t_{count} > t_{table}$ or $3,1057 > 2,0796$. Simple correlation coefficient (r) between student learning styles with mathematics learning result of 0,5610 with $\hat{Y} = -98,742 + 2,2306 X_1$. There was a positive and significant relationship between mathematics learning's intence with the results of learning Mathematics Students in Class VIII grade high school student at SMP Muhammadiyah Piyungan in the second semester in the year of 2017/2018. It is announced by $t_{count} > t_{table}$ or $3,9954 > 2,0796$. The simple correlation coefficient (r) between the intence of mathematics learning with mathematics learning result of 0,6571 with $\hat{Y} = -18,32 + 1,121 X_2$. There was a positive and significant relationship between students' learning style and the intensity of mathematics learning with the results of learning Mathematics Students in Class VIII grade high school student St SMP Muhammadiyah Piyungan in the second semester of the year of 2017/2018. It is announced by $F_{count} > F_{table}$ that is $11,228 > 3,4900$ with $R = 0,727278723$ and $R^2 = 0,528934340$ with $\hat{Y} = -93,430838784 + 1,368097961 X_1 + 0,872373868 X_2$ with $RC_1 = 36,49\%$ and $RC_2 = 63,50\%$. While for $EC_1 = 19,30\%$ and $EC_2 = 33,58\%$.

Keywords: learning style, intense mathematic learning, the result of learning

INTRODUCTION

Education is one of the references used to see the progress of a nation. A nation is said to advance if education is successfully implemented. In the opening of the 1945 Constitution, the fourth paragraph stated that one of the Government of the State of Indonesia's objectives is to educate the nation's life. The implementation of education can be carried out in the form of a learning activity process that implements the school curriculum.

Mathematics is one of the subjects contained in every level of education. It is a basic science that has an important role in everyday life. One important role in everyday life, mathematics, is needed to master and create future technology. Although it is known that mathematics is important science, in reality, there are still many students who consider mathematics a difficult subject. This has an impact on mathematics learning outcomes that are still low and not as expected.

Table 1. Mid-Semester Grades VIII SMP Muhammadiyah Piyungan Even Semester 2017/2018 Academic Year

Score	Class		
	VIII A	VIII B	VIII C
Average	51,91	48,86	40,52
Max	74,00	70,00	50,00
Min	40,00	33,00	0,00
MCC	75,00	75,00	75,00
< MCC	23	22	21
≥ MCC	-	-	-

Based on the above sources in Table 1, it appears that the Middle Semester Assessment of mathematics subjects in class VIII of SMP Muhammadiyah Piyungan is still low. Several factors may cause poor learning outcomes.

One factor that has an impact on mathematics learning outcomes is student learning styles. According to Winkel, learning style is a unique way of learning for students. There are three types of learning styles, namely visual, auditory, and kinesthetic learning styles. Student learning styles will influence learning outcomes, such as the results of research conducted by Citra and Anista. Based on students' observations, they do not recognize learning styles that fit each student's characteristics.

The intensity of learning is also one factor that has a role in the learning process of students. The word intensity comes from intense English, which means spirit, enterprising, and healthy. In simple terms, the intensity can be interpreted as an effort made by someone with enthusiasm to achieve a goal. At the same time, Susena revealed some things included in student learning intensity indicators are learning motivation, learning duration, learning frequency, learning presentations, the direction of learning attitude, learning attitude, and learning activities such as the research results Janah and Rachman. Based on interviews with some students, it was found that students did not re-study the material that the teacher had given in class. They only studied at the time of the exam.

In this study, the following problems were formulated: (1) Is there a positive and significant relationship between students' learning styles and mathematics learning outcomes of Grade VIII students of SMP Muhammadiyah Piyungan in the even semester of the academic year 2017/2018? (2) Is there a positive and significant relationship between mathematics learning intensity with the mathematics learning outcomes of students of class VIII at SMP Muhammadiyah Piyungan in the even semester of the academic year 2017/2018? (3) Is there a positive and significant relationship between student learning styles and the intensity of mathematics learning with mathematics learning outcomes of students of class VIII of SMP Muhammadiyah Piyungan Even Semester Academic Year 2017/2018?

From the main problems that have been formulated above, the purpose of this study is to determine whether there is a positive and significant relationship between student learning styles and the intensity of mathematics learning with mathematics learning outcomes for students of class VIII of SMP Muhammadiyah Piyungan. Even Semester Academic Year 2017/2018.

METHODS

This research was conducted in class VIII of SMP Muhammadiyah Piyungan in the even semester of the academic year 2017/2018, with the test class being class VIII B and the sample class being VIII A, where class VIII A and class VIII B consisted of 23 students and 22 students respectively. In this study, three variables are consisting of two independent variables, namely student learning styles (X_1), the intensity of learning mathematics (X_2), and one dependent variable, namely the learning outcomes of mathematics (Y).

Based on the research variables above, the scheme of the relationship between the independent variable and the dependent variable can be arranged as follows in Figure 1.

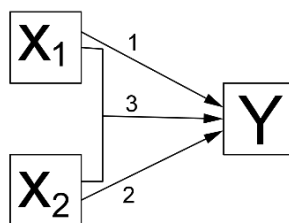


Figure 1. Schema of the Relationship between Independent Variables and Bound Variables

Information:

X_1 : Student Learning Styles

X_2 : Intensity of Learning Mathematics

Y : Mathematics Learning Outcomes

Data collection techniques used a questionnaire method to obtain data on student learning styles and the intensity of mathematics learning, and test methods to obtain data on mathematics learning outcomes. The research instrument tests conducted were validity, different power tests, and reliability tests. Analysis prerequisite tests include normality test, linearity test, and independent test. Data analysis uses product moment analysis and multiple linear regression analysis.

RESULTS AND DISCUSSION

Learning style scores obtained from the learning style questionnaire given to students numbering 24, with the highest score of 72 and the lowest score of 56, obtained an average value of 65.48 and a standard deviation of 4.305. From these criteria, the grouping of reasoning ability scores is obtained as follows Table 2.

Table 2. Distribution of Number of Students by Category Learning Style Score

Category	Score	<i>F</i>	%
High	$X > 69,78$	6	26,09
Medium	$61,73 \leq X \leq 69,78$	13	56,52
Low	$X < 61,73$	4	17,39
	Total	23	100

From the results of the categorization in the table above, it can be seen that the majority of class VIII A SMP Muhammadiyah Piyungan Even Semester for the Academic Year 2017/2018 has a frequency of learning styles located at intervals of $61.73 \leq X \leq 69.78$ with the moderate category of 13 students or 56.52%.

The score of mathematics learning intensity was obtained from a questionnaire given to students, which totaled 24 items, with the highest score of 77 and the lowest score of 42, an average value of 59.36, and a standard deviation of 10.53. From this criterion, a grouping of mathematics learning intensity scores is obtained as follows:

Table 3. Distribution of Number of Students Based on Mathematics Intensity Score Categories

Category	Score	<i>F</i>	%
High	$X > 69,90$	4	17,39
Medium	$48,84 \leq X \leq 69,90$	12	52,17
Low	$X < 48,84$	7	30,43
	Total	23	100

From the results of the categorization in the table 3 above, it can be seen that the majority of class VIII A SMP Muhammadiyah Piyungan Even Semester 2017/2018 Academic Year has a frequency level of mathematics learning intensity which is located at intervals of $48.84 \leq X \leq 69.90$ with moderate categories, namely as many as 12 students or 52.17%.

The value of mathematics learning outcomes is obtained from a test of learning outcomes, amounting to 20 multiple choice questions with the highest value of 85 and the lowest value of 15. It obtained an average value of 47.63 and a standard deviation of 18.53. From these criteria, the grouping of mathematics learning outcomes is obtained as follows:

Table 4. Distribution of Number of Students by Students' Mathematical Learning Outcomes Categories

Category	Score	F	%
High	$X > 66,16$	3	13,04
Medium	$29,10 \leq X \leq 66,16$	17	73,91
Low	$X < 29,10$	3	13,04
	Total	23	100

From the results of the categorization in the above table 4, it can be seen that the majority of class VIII A of SMP Muhammadiyah Piyungan Even Semester for Academic Year 2017/2018 is included in the medium category because the highest frequency is located at intervals of $29.10 \leq X \leq 66.16$, i.e., as many as 17 students or 73.91%.

The analysis prerequisite tests are carried out to provide an overview of how the data's planned technical analysis can meet the prerequisites' assumptions. This study's prerequisite test analysis is the normality test, linearity test, and independence test.

A normality test is used to test the distribution of data obtained on each variable that is customarily distributed. The normality test in this study uses the chi-square formula (χ^2). The decision making criteria is the distribution of data obtained on each variable with normal distribution if $\chi^2_{count} \leq \chi^2_{table}$ with a significant level of 5% and the degree of freedom $k-1$. Where k is the number of interval classes. The normality test results are presented in the following table 5.

Table 5. Summary of Test Results for Research Variables Normality

No	Variable	χ^2_{count}	χ^2_{table}	df	Info.
1	Student Learning Styles (X_1)	1,1185	5,991	2	Normal
2	The Intensity of Learning Mathematics (X_1)	4,7759	5,991	2	Normal
3	Mathematical Learning Outcomes (Y)	1,1003	5,991	2	Normal

After the normality test, the linearity test is performed. The linearity test is used to determine whether the independent variable and the dependent variable have a linear relationship or not by using the linear regression formula (Test F). The decision making criteria is the relationship between variables X and Y linear if $F_{count} \leq F_{table}$ is 5% significant and df numerator = $k - 2$ and denominator $db = n - k$. In this study, a summary of the linearity test results of the independent variables and the dependent variable can be seen in the following table:

Table 6. Summary of Linearity Test Results

No.	Variable	F_{count}	F_{table}	Info.
1	X_1 with Y	1,35	2,4226	Linear
2	X_2 with Y	1,15	2,6850	Linear

The independent test was used to determine the presence or absence of a relationship between the independent variables, namely the student learning style variable (X_1) and the mathematics learning intensity variable (X_2), using the chi-square formula. The decision making criteria are variable X_1 and variable X_2 are independent if $\chi^2_{count} \leq \chi^2_{table}$, at 5% and degrees of freedom $df = (B - 1)(K - 1)$. Where B is the number of rows, and K is the number of columns. The independent test results are presented in the following table:

Table 7. Summary of Independent Test Results

No	Variable	χ^2_{count}	χ^2_{table}	Info.
1	X_1 with X_2	24,2869	37,6225	Independent

The purpose of the discussion of the results of this study was to determine the relationship between student learning styles (X_1) and Mathematics Learning Intensity (X_2) with Mathematical Learning Outcomes (Y) of Class VIII students of SMP Muhammadiyah Piyungan Even Semester Academic Year 2017/2018. In this section, further discussion of the results of the research analyzed in correlation.

In the first hypothesis test, a simple correlation coefficient (r) of 0.5610 was obtained. The coefficient of determination (r^2) is obtained by 0.3147, which can be explained that students' learning styles influence 31.47% of learning outcomes. In contrast, the rest is influenced by other factors. There are variations in mathematics learning outcomes (Y), explained by student learning styles (X_1) through linear lines $\hat{Y} = -98,742 + 2,2306 X_1$, with a regression coefficient of 2.2306. The first hypothesis test results are accepted that there is a positive and significant relationship between student learning styles with mathematics learning outcomes. In other words, the higher the student's learning style, the better the student's learning outcomes.

In the second hypothesis test, a correlation coefficient (r) of 0.6571 is obtained. The coefficient of determination (r^2) is obtained for 0.4318, which can explain 43.18% of learning outcomes influenced by learning mathematics intensity. In contrast, the rest is influenced by other factors. There is a variation in mathematics learning outcomes (Y), which is explained by the intensity of learning (X_2) through a linear line $\hat{Y} = -18.32 + 1,121 X_2$ with a regression coefficient of 1.121. The second hypothesis test result is accepted that there is a positive relationship between learning intensity with mathematics learning outcomes.

The multiple correlation analysis obtained the value of the multiple correlation coefficient (R) of 0.7272. This study also obtained a coefficient of determination (R^2) of 0.5289, meaning that student learning styles and learning intensity influence 52.89% of learning outcomes. In contrast, the rest is influenced by other factors. There is a variance in mathematics learning outcomes (Y), which can be explained by reasoning ability (X_1) and learning intensity (X_2) through linear lines $\hat{Y} = 93,4308 + 1,3680 X_1 + 0,8723 X_2$. As for the relative contribution of X_1 of 36.49% and X_2 of 63.50% and the effective contribution of X_1 of 19.30% and X_2 of 33.58%, it can be concluded that the variable of mathematics learning intensity gives the most significant contribution to the learning outcomes of on student learning style variables. The third hypothesis test results are accepted that there is a positive and significant relationship between student learning styles and learning intensity with mathematics learning outcomes.

CONCLUSION

Based on the research and discussion results described above, it can be concluded that: (1) there is a positive and significant relationship between student learning styles and student mathematics learning outcomes. This is indicated by the t-test that is $t_{count} > t_{table}$ or $3.1057 > 2.0796$. Simple correlation coefficient (r) between student learning styles with mathematics learning outcomes of 0.5610 with a linear regression equation $\hat{Y} = -98,742 + 2,2306 X_1$. (2) There is a positive and significant relationship between the intensity of mathematics learning and student mathematics learning outcomes. This is indicated by the t-test that is $t_{count} > t_{table}$ or $3.9954 > 2.0796$. The simple correlation coefficient (r) between student learning styles with mathematics learning outcomes of 0.6571 with a linear regression equation $\hat{Y} = -18.32 + 1.121 X_2$. (3) There is a positive and significant relationship between learning styles and learning intensity with the mathematics learning outcomes of VIII grade students of SMP Muhammadiyah Piyungan Even Semester 2017/2018 Academic Year. This is indicated by the F-test that is $F_{count} > F_{table}$ or $11.22284 > 3.4900$. The multiple correlation coefficient (R) between student learning styles and learning intensity with mathematics learning outcomes is 0.7272, and (R^2) is 0.5289 with a double linear regression equation $\hat{Y} = -93,4308 + 1,3680 X_1 + 0,8723 X_2$. The relative contribution of X_1 is 36.49%, and the relative

contribution of X_2 is 63.50%. The effective contribution of X_1 is 19.30%, and the effective contribution of X_2 is 33.58%.

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