

## THE RELATION BETWEEN LEARNING STYLE, INDEPENDENCE LEARNING, PARENTS' ATTENTION AND MATHEMATICS LEARNING OUTCOMES OF GRADE X VISUAL COMMUNICATION DESIGN STUDENTS OF SMK

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### ABSTRACT

Mathematics students are learning outcomes associated with many factors. Learning style, independence learning, and parents' attention are some of the factors allegedly related to learning outcomes. The researches are intended to know about is there any positive correlation and significance or not between learning style, independence learning, parents' attention and mathematics learning outcomes of grade X Visual Communication Design students of State Vocational High School 5 Yogyakarta (SMK Negeri 5 Yogyakarta) in the even semester of the academic year of 2016/2017. The population in this research was the student's grade X Visual Communication Design of SMK Negeri 5 Yogyakarta of 2016/2017, consisting of class X Visual Communication Design A and class X Visual Communication Design B, totaling 62 students. Samples were taken from X Visual Communication Design B as the research sample class and random sampling technique. The writer uses a questionnaire method to collect the learning style, independence learning, parents' attention, and test method to get the resulting learning of math. The research instrument: validity test, different power test, and reliability test. Test requirement analysis includes a test of normality, a test of linearity, and independence. The writer uses product-moment correlation analysis and multiple linear regression analysis to analyze the data. The results showed a positive and significant relationship between learning style, independence learning, parents' attention with mathematics learning outcomes of grade X Visual Communication Design students of SMK Negeri 5 Yogyakarta in the even semester of the academic year of 2016/2017. It is showed by  $F_{count} > F_{table}$  is  $6,2085 > 2,9500$  with  $R = 0,6320$  and  $R^2 = 0,3994$  with  $\hat{Y} = -86,6041 + 0,8951 X_1 + 0,5661 X_2 + 0,3232 X_3$ , with  $RC X_1 = 48,9852\%$ ,  $RC X_2 = 31,0964\%$  and  $RC X_3 = 19,9183\%$ ,  $EC X_1 = 19,5680\%$ ,  $EC X_2 = 12,4221\%$  and  $EC X_3 = 7,9568\%$ .

**Keywords:** Learning Style, Independence Learning and Parents' Attention, Mathematics Learning Outcomes

### INTRODUCTION

According to Law Number 20 of 2003 concerning the National Education System article 1, paragraph 20 states that learning is the interaction of students with educators and learning resources in a learning environment. The process of interaction is an effort made by students to get good results. The intended results are learning outcomes. This was done by direct observation and interviews with several students at SMK Negeri 5 Yogyakarta as a preliminary study. Based on observations and interviews with several students at SMK Negeri 5 Yogyakarta in the learning process, students follow the learning well. However, there are still some students who pay less attention when the teacher is explaining mathematics. Also, when given homework, students have difficulty in solving mathematical problems. Difficulties experienced by students resulted in many students getting grades under the MCC. Attention from parents at home is also very minimal so that students lack motivation and encouragement to learn.

The low mathematics learning outcomes of students of SMK Negeri 5 Yogyakarta 2016/2017 Academic Year, can be seen from the pure value of Even Semester Mathematics UAS obtained from class X Visual Communication Design A and Class X Visual Communication Design B. The MCC for the specified mathematics subject is 75 Of the 62 students 37 students had not yet reached the MCC score. This shows that the results of student mathematics learning are still low. Several factors can affect the low percentage of completeness in learning. According to Slameto (2013: 54), factors that

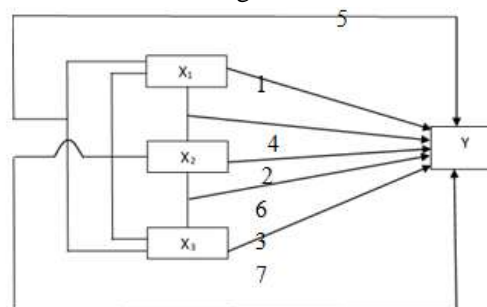
influence learning outcomes are internal and external. Internal factors originate from within, classified as physical factors, psychological factors, and fatigue factors. While external factors, namely, factors originating from outside the student, are classified as family factors, school factors, and community factors.

Learning style is one of the important factors in supporting students' success in learning. If the learning activities are by the learning style, students will find it easier to understand the material. But if students must follow ways of learning that are not by their learning styles, it can result in students not being able to achieve maximum learning outcomes. For example, a student who prefers to study in a calm state is likely to find it difficult to learn while in noisy classrooms so that these students cannot achieve maximum learning outcomes. Some students say the teacher's assignment is too difficult, so the student prefers to imitate the results of other students' assignments. That is certainly not a good thing. Students who only mimic other students' assignments without understanding the results of the assignment will make these students become less understanding and reduce their sense of independence because these students are accustomed to imitating assignments from other students without trying to do the task themselves.

Environmental factors also affect student learning outcomes. These environmental factors include friends at school, friends at home, and parents. Among these environmental factors, parents have a role that is no less important for students in the learning process. Students stated that while at home, there are still many parents who do not pay attention to student learning activities. So some students feel they do not get enough support to study. Parents are the first center of education for students. Before entering school, a child first gets a lesson from parents. When entering school, parents must be able to give their attention to increasing student motivation in learning.

## METHODS

This research is quantitative. The research design used is as follows:



**Figure 1.** Research Design

Information :

X<sub>1</sub>: Learning Style

X<sub>2</sub>: Learning Independence

X<sub>3</sub>: Attention Parents

Y: Mathematics Learning Outcomes.

This research was conducted at SMK Negeri 5 Yogyakarta. The research time is in the even semester of the 2016/2017 school year. The population in this study were students of class X Visual Communication Design 2016/2017 school year consisting of 2 classes with a total of 62 students. Samples were carried out using class random sampling techniques. The sample of this study was students of class X Visual Communication Design B, with a total of 32 students. Data collection techniques using non-test instruments and test instruments. Non-test instruments in the form of a questionnaire are used to determine learning styles, independence, and parents' attention. Test instrument to find out the results of learning mathematics with Trigonometry material. A validity test using item analysis is done using the product-moment formula. Reliability test using the Cronbach Alpha formula. Analysis prerequisite test with normality test and independence test using Chi-Square

formula, and linearity test using the F-Test formula. The research hypothesis testing uses a simple correlation test, multiple regression analysis tests, and multiple linear regression test with three independent variables.

## RESULTS AND DISCUSSION

A normality test is used to test the distribution of data obtained on each variable normally distributed or not. The normality test in this study uses the chi-square formula. 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 a degree of freedom  $k-1$ . Where  $k$  is the number of interval classes. The normality test results for the four variables can be seen in Table 2 as follows:

**Table 2.** Normality Test Results

Variable	$\chi^2_{count}$	$\chi^2_{table}$	df	Info.
Learning Style ( $X_1$ )	5,1522	7,815	3	Normal
Independence Learning ( $X_2$ )	6,8738	7,815	3	Normal
Parents attention ( $X_3$ )	0,5331	5,591	2	Normal
Mathematical Learning Outcomes (Y)	4,3654	5,591	2	Normal

In table 2, you can see  $\chi^2_{count} \leq \chi^2_{table}$ ; this means that the data distribution obtained for each variable is normally distributed.

The independent test is used to determine the presence or absence of a relationship between the independent variable of learning styles ( $X_1$ ) with the independent variable of learning independence ( $X_2$ ), the relationship between the independent variables of learning styles ( $X_1$ ) and the independent variables of parents' attention ( $X_3$ ), and the relationship between variables free learning independence ( $X_2$ ) with the parent's free variable of attention ( $X_3$ ) using the Chi-squared formula. The decision-making criteria are that the two variables are independent if  $\chi^2_{count} \leq \chi^2_{table}$ , at  $\alpha = 5\%$ , and degrees of freedom  $(dk) = (B - 1)(K - 1)$ . Where  $B$  is the number of rows, and  $K$  is the number of columns. The summary of the independence test results can be seen in Table 3 as follows:

**Table 3.** Independent Test Results

Variable	$\chi^2_{count}$	$\chi^2_{table}$	df	Conclusion
$X_1$ and $X_2$	32,096	37,652	25	Independent
$X_1$ and $X_3$	27,579	37,652	25	Independent
$X_2$ and $X_3$	25,889	37,652	25	Independent

In table 3 you can see  $\chi^2_{count} \leq \chi^2_{table}$ , this means that the variable is the learning style variable ( $X_1$ ) with the learning independence variable ( $X_2$ ), the learning style variable ( $X_1$ ) with the parent's attention variable ( $X_3$ ) and the learning independence variable ( $X_2$ ) with the parent's concern variable ( $X_3$ ) are independent.

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 the variables  $X$  and  $Y$  linear if  $F_{count} \leq F_{table}$ , with a significant level of 5% and a degree of freedom numerator  $(v_1) = k - 2$  and the denominator's degree of freedom  $(v_2) = n - k$ . This study for  $X_1$  for  $Y$  with  $v_1 = 16$  and  $v_2 = 14$ , for  $X_2$  for  $Y$  with  $v_1 = 19$  and  $v_2 = 11$ , and for  $X_3$  against  $Y$  with  $v_1 = 16$  and  $v_2 = 14$ . The summary of linearity test results can be seen in Table 4 as follows:

**Table 4.** Linearity Test Results

Variable	$F_{count}$	$F_{table}$	Conclusion
$X_1$ and $Y$	0,6393	2,4446	Linear
$X_2$ and $Y$	-0,0067	2,6581	Linear
$X_3$ and $Y$	1,2493	2,4446	Linear

Table 4 shows  $F_{count} \leq F_{table}$ ; this means that learning styles with linear learning outcomes, learning independence with linear learning outcomes, and parents' attention with linear learning outcomes.

- a. **First Hypothesis.** A simple correlation analysis obtained a simple correlation coefficient ( $r$ ) between learning styles with mathematics learning outcomes of 0.5331. Furthermore, testing the significance of the correlation coefficient by using the t-test obtained  $t_{count} = 3,4514$  while  $t_{table} = 1,6973$  at a significant level of 5% and  $= n - 2 = 32 - 2 = 30$ . The rejection area used is  $t_{count} > t_{table}$ . Then obtained  $3,4514 > 1,6973$ , so  $H_{0,1}$  was rejected, and  $H_{1,1}$  was accepted, so there is a positive and significant relationship between learning styles with mathematics learning outcomes of class X students of SMK Negeri 5 Yogyakarta even semester 2016/2017 academic year. Also, we also obtained a simple regression equation for Y over  $X_1$  is  $\hat{Y} = -49,1413 + 1,3000 X_1$ .
- b. **Second Hypothesis.** With a simple correlation analysis obtained by the simple correlation coefficient ( $r$ ) between learning independence with mathematics learning outcomes of 0.4775. Furthermore, testing the significance of the correlation coefficient by using the t-test obtained  $t_{count} = 2,9770$  while  $t_{table} = 1,6973$  at a significant level of 5% and  $= n - 2 = 32 - 2 = 30$ . The rejection area used is  $t_{count} > t_{table}$ . Then obtained  $2,9770 > 1,6973$ , so that  $H_{0,1}$  was rejected, and  $H_{1,1}$  was accepted, so there is a positive and significant relationship between learning independence and mathematics learning outcomes of class X students of SMK Negeri 5 Yogyakarta even semester 2016/2017 academic year. A simple regression equation of Y for  $X_2$  is also obtained as  $\hat{Y} = -30,3297 + 1,0393 X_2$ .
- c. **Third Hypothesis.** With a simple correlation analysis obtained by the simple correlation coefficient ( $r$ ) between parents' attention and mathematics learning outcomes of 0.3912. Furthermore, in testing the significance of the correlation coefficient by using the t-test obtained  $t_{count} = 2,3281$  while  $t_{table} = 1,6973$  at a significant level of 5% and  $v = n - 2 = 32 - 2 = 30$ . The rejection area used is  $t_{count} > t_{table}$ . Then obtained  $2,3281 > 1,6973$ , so  $H_{0,1}$  is rejected, and  $H_{1,1}$  is accepted. So there is a positive and significant relationship between parents' attention and mathematics learning outcomes of class X students of SMK Negeri 5 Yogyakarta even semester 2016/2017 academic year. Also, a simple regression equation of Y over  $X_3$  is  $\hat{Y} = 1,1007 + 0,6216 X_3$ .
- d. **Hipotesis Keempat.** With a simple correlation analysis obtained by the value of the correlation coefficient ( $R$ ) between learning styles and learning independence with mathematics learning outcomes of 0.6029. Furthermore, in testing the significance of the correlation coefficient by using the - F test obtained  $F_{count} = 8.2802$  while  $F_{table} = 3.3277$  at a significant level of 5% and  $v_1 =$  two and  $v_2 = 29$  so that  $F_{count} > F_{table}$  is obtained. Thus  $H_{0,4}$  rejected, and  $H_{1,4}$  accepted, so there is a positive and significant relationship between learning style and learning independence with mathematics learning outcomes of students of class X SMK Negeri 5 Yogyakarta even semester 2016/2017 academic year. Also obtained a double linear regression equation over  $X_1$  and  $X_2$  is  $\hat{Y} = -76,8440 + 0,9865X_1 + 0,6736X_2$ .
- e. **Fifth Hypothesis.** A simple correlation analysis was obtained by the value of the correlation coefficient ( $R$ ) between learning styles and parental attention with mathematics learning outcomes of 0.5886. Furthermore, in testing the significance of the correlation coefficient by using the - F test obtained  $F_{count} = 7.6867$  while  $F_{table} = 3.3277$  at a significant level of 5% and  $v_1 = 2$  and  $v_2 = 29$  so that obtained  $F_{count} > F_{table}$ . Thus  $H_{0,4}$  rejected, and  $H_{1,4}$  accepted, so there is a positive and significant relationship between learning styles and parents' attention with mathematics learning outcomes of class X students of SMK Negeri 5 Yogyakarta even semester 2016/2017 academic year. Also obtained a double linear regression equation over  $X_1$  and  $X_3$  are  $\hat{Y} = -62,32306 + 1,1190X_1 + 0,4136X_3$ .
- f. **Sixth Hypothesis.** With a simple correlation analysis obtained by the value of the correlation coefficient ( $R$ ) between learning independence and the attention of parents with mathematics

learning outcomes of 0.5399. Furthermore, in testing the significance of the correlation coefficient by using the - F test,  $F_{count} = 5.9653$  while  $F_{table} = 3.3277$  at a significant level of 5% and  $v_1 = 2$  and  $v_2 = 29$  so that  $F_{count} > F_{table}$  is obtained. Thus  $H_{0,6}$  was rejected, and  $H_{1,6}$  was accepted, so there is a positive and significant relationship between learning independence and parents' attention with mathematics learning outcomes of class X students of SMK Negeri 5 Yogyakarta even semester 2016/2017 academic year. Also obtained multiple linear regression equations above  $X_2$  and  $X_3$  is  $\hat{Y} = -48,7184 + 0,8546X_2 + 0,4224X_3$ .

- g. Seventh Hypothesis.** With a double analysis obtained the value of the correlation coefficient ( $R$ ) between learning styles, learning independence and attention of parents with mathematics learning outcomes of 0.6320. Furthermore, in testing the significance of the correlation coefficient using the F-test obtained  $F_{count} = 6.2085$  while  $F_{table} = 2.95$  at a significant level of 5% and  $v_1 = 3$  and  $v_2 = n - m - 1 = 32 - 3 - 1 = 28$  so that it is obtained  $F_{count} > F_{table}$ . Thus  $H_{0,7}$  is rejected, and  $H_{1,7}$  is accepted so there is a positive and significant relationship between learning styles, learning independence and parents' attention with mathematics learning outcomes of class X students of SMK Negeri 5 Yogyakarta even semester 2016/2017 school year Also, also obtained a double linear regression equation for  $X_1$ ,  $X_2$ , and  $X_3$  is  $\hat{Y} = -86,6041 + 0,8951 X_1 + 0,5661 X_2 + 0,3232X_3$ .

## CONCLUSION

1. There is a positive and significant relationship between learning styles with mathematics learning outcomes of class X students of SMK Negeri 5 Yogyakarta, even semester 2016/2017 academic year. This is indicated by the t-test that is  $t_{count} > t_{table}$  or  $3.4514 > 1.6973$ . The simple correlation coefficient ( $r$ ) between learning styles with mathematics learning outcomes of 0.5331. And the simple regression equation Y for  $X_1$  is  $\hat{Y} = -49,1413 + 1,3000X_1$ .
2. There is a positive and significant relationship between learning independence and mathematics learning outcomes of class X students of SMK Negeri 5 Yogyakarta, even semester 2016/2017 academic year. This is indicated by the t-test that is  $t_{count} > t_{table}$  or  $2.9770 > 1.6973$ . The simple correlation coefficient ( $r$ ) between learning independence with mathematics learning outcomes of 0.4775. And the simple regression equation Y for  $X_2$  is  $\hat{Y} = -30,3297 + 1,0393 X_2$ .
3. There is a positive and significant relationship between parents' attention and mathematics learning outcomes of class X students of SMK Negeri 5 Yogyakarta, even semester 2016/2017 academic year. This is indicated by the t-test that is  $t_{count} > t_{table}$  or  $2.3281 > 1.6973$ . The simple correlation coefficient ( $r$ ) between learning independence and mathematics learning outcomes is 0.3912. Moreover, the simple regression equation for Y over  $X_3$  is  $\hat{Y} = 1,1007 + 0,6216 X_3$ .
4. There is a positive and significant relationship between learning styles and learning independence with student mathematics learning outcomes X SMK Negeri 5 Yogyakarta, even semester 2016/2017 academic year. This is indicated by the F test, which is  $F_{count} > F_{table}$  or  $8.2802 > 3.3277$ . The multiple correlation coefficient ( $R$ ) between learning styles and learning independence with mathematics learning outcomes is 0.6029 with a linear line equation  $\hat{Y} = -76,8440 + 0,9865X_1 + 0,6736 X_2$ . The relative contribution of  $X_1$  is 59.33376%, and  $X_2$  is 40.6624%, and the effective contribution of  $X_1$  is 21.5681%, and  $X_2$  is 14.7800%.
5. There is a positive and significant relationship between learning styles and parents' attention with the mathematics learning outcomes of class X students of SMK Negeri 5 Yogyakarta, even semester 2016/2017 academic year. This is indicated by the F test that is  $F_{count} > F_{table}$  or  $7.6867 > 3.3277$ . The correlation coefficient ( $R$ ) between learning styles and parents' attention to mathematics learning outcomes is 0.5886 with a linear line equation  $\hat{Y} = -62,3231 + 1,1190X_1 + 0,4136X_3$ . The relative contribution of  $X_1$  was 70.6114%, and  $X_3$  was 29.3886%, and the effective contribution of  $X_1$  was 24.4636%, and  $X_3$  was 10.1818%.

6. There is a positive and significant relationship between learning independence and parents' attention with the mathematics learning outcomes of class X students of SMK Negeri 5 Yogyakarta, even semester 2016/2017 academic year. This is indicated by the F test, which is  $F_{count} > F_{table}$  or  $5.9653 > 3.3277$ . The correlation coefficient ( $R$ ) between parents' attention and learning environment in schools with mathematics learning outcomes is 0.5399 with a linear line equation  $\hat{Y} = -48,7184 + 0,8546X_2 + 0,4224X_3$ . The relative contribution of  $X_2$  was 64.3318%, and  $X_3$  was 35.6682%, and the effective contribution of  $X_2$  was 18.7517%, and  $X_3$  was 10.3967%.
7. There is a positive and significant relationship between learning styles, learning independence, and parents' attention with the mathematics learning outcomes of class X students of SMK Negeri 5 Yogyakarta, even semester 2016/2017 academic year. This is indicated by the F test that is  $F_{count} > F_{table}$  or  $6.2085 > 2.9500$ . The correlation coefficient ( $R$ ) between learning styles, learning independence, and parents' attention with mathematics learning outcomes of 0.6320 and the coefficient of determination ( $R^2$ ) of 0.3994 with a linear line equation  $\hat{Y} = -86,6041 + 0,8951 X_1 + 0,5661 X_2 + 0,3232 X_3$ . The relative contribution of  $X_1$  is 48.9852%,  $X_2$  is 31.0964%, and  $X_3$  is 19.9183%, and the effective contribution is  $X_1$  is 19.5680  $X_2$  is 12.4221 %, and  $X_3$  is 7.9568%.

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