

THE RELATIONSHIP BETWEEN LEARNING MOTIVATION, LEARNING FACILITIES AND LEARNING INDEPENDENCE WITH STUDENT RESULT IN MATHEMATIC LEARNING IN CLASS VIII SMP MUHAMMADIYAH PAKEM

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ABSTRACT

Low students, the results of learning, are associated with many factors. Learning motivation, learning facilities, and learning independence are factors that have a relationship with the learning results. This study aims to determine whether or not a positive and significant relationship between learning motivation, learning facilities, and independence of learning with the results of learning mathematic students of class VIII SMP Muhammadiyah Pakem Sleman second Semester Teaching Year 2016/2017. The population in this study comprises students of class VIII SMP Muhammadiyah Pakem Sleman District second Semester of the academic year 2016/2017 consisting of 4 classes with a total of 151 students. Random sampling techniques took the experimental class and the sample class to the class. They obtained the trial class VIII A and VIII D as the sample class. The test and questionnaire method do the technique of collecting data. Test the instrument using the validity test, the test of different power, and reliability test. Test prerequisite analysis that is normality test, independent test, and linearity test. Data analysis for hypothesis testing using correlation analysis and linear regression analysis. The results showed that there is a positive and significant relationship between learning motivation, learning facilities, and learning independence with mathematics learning results with $F_{\text{count}} = 6,7209$ and $F_{\text{table}} = 2,8826$, so that obtained $F_{\text{count}} > F_{\text{table}}$. Coefficient of double correlation (R) equal to 0,6102 and coefficient of determination (R^2) equal to 0,3723 with linear regression equation that is $\hat{Y} = 10,1472 + 0,3886X_1 + 0,2961X_2 + 0,1626X_3$. Relative contribution X_1 that is equal to 59,0770%, X_2 equal to 29,3821% and X_3 equal to 11,5409% and effective contribution X_1 equal to 21,9921%, X_2 that is equal to 10,9379% and X_3 that is equal to 4,2962%.

Keywords: Learning motivation, learning facilities, learning independence, the results of learning mathematic.

INTRODUCTION

The rapid development of Information and Technology and the increasingly intense current of globalization as demanded by high-quality human resources. The quality of human resources can be improved through education. Education is a cultural process to enhance human dignity. Education is a shared responsibility between family, government, and human beings. It takes an active role to be improved and encouraged at all levels of education. Based on the results of an interview with Mr. Maryanto S. Pd as a teacher in the field of mathematics studies conducted on Tuesday, 18 October 2016, at 13:00 at Muhammadiyah Middle School, Pakem showed a shallow learning motivation. This can be seen from several problems, namely the number of students who are often late for school when there are math assignments that must be collected on time there are still some students who do not receive them on time, when the teacher explains the lesson there are still some students who tell stories with their peers and do not pay attention explanation from the teacher, and when the class changes, the teacher has entered the class. Still, some students leave and do not permit the teacher. The midterm results are only about two students whose grades are above the CCM. From some of these things, it can be concluded that some students are not motivated to take mathematics. Students should get better motivation to continue learning, both from the teacher and from parents. Many children's talents do not develop because they don't get the right motivation. If a person gets the right motivation, then he will

achieve better learning outcomes. Appreciation for learning outcomes is also one way for students to continue to be motivated to become better at learning.

Based on interviews with teachers, information was also obtained. Not all the facilities owned by students were complete due to different economic factors. The distance between home to school is far. Books in schools such as the 2006 curriculum books are not sufficient for the number of students. LCDs in schools are also limited to only 3 out of 12 classes. If there are teachers who use LCDs, other teachers who want to apply must budge and only use the blackboard. The teaching aids in the school are already damaged, so it is impossible to use the teaching aids. It can be concluded that learning facilities are inadequate to affect student learning outcomes in learning and understanding mathematics.

Further found the fact that the independence of student learning is low. This can be seen when following the teaching and learning process of many passive students. Then students are reluctant to open books on their own, and some students do homework while at school, and some even cheat their friends. It can be concluded that the independence of students is low so that it will affect student learning outcomes in learning and understanding mathematics.

Based on interviews with the teacher also obtained information about the results of learning mathematics in class VIII, found the facts are still shallow.

The objectives of this research are:

- 1) To determine whether there is a positive and significant relationship between learning motivation and learning outcomes in eighth-grade students of SMP Muhammadiyah Pakem, Sleman Regency in the even semester of the 2016/2017 school year.
- 2) To determine whether there is a positive and significant relationship between learning facilities and learning outcomes in eighth-grade students of SMP Muhammadiyah Pakem, Sleman Regency in the even semester of the 2016/2017 school year.
- 3) To determine whether there is a positive and significant relationship between learning independence with learning outcomes in eighth-grade students of SMP Muhammadiyah Pakem, Sleman Regency in the even semester of the 2016/2017 school year.
- 4) To determine whether there is a positive and significant relationship between learning motivation and learning facilities with learning outcomes in eighth-grade students of SMP Muhammadiyah Pakem, Sleman Regency in the even semester of the 2016/2017 school year.
- 5) To determine whether there is a positive and significant relationship between learning motivation and learning independence with mathematics learning outcomes in eighth-grade students of SMP Muhammadiyah Pakem, Sleman Regency in the even semester of the 2016/2017 school year.
- 6) To determine whether there is a positive and significant relationship between learning facilities and learning independence with mathematics learning outcomes in eighth-grade students of SMP Muhammadiyah Pakem, Sleman Regency in the even semester of the 2016/2017 school year.
- 7) To determine whether there is a positive and significant relationship between learning motivation, learning facilities, and learning independence with mathematics learning outcomes in eighth-grade students of SMP Muhammadiyah Pakem Sleman Regency in the even semester of the 2016/2017 school year.

RESEARCH METHODE

This research is a correlation study with four variables consisting of three independent variables and one dependent variable. These variables are learning motivation (X_1), teaching facilities (X_2), and learning independence (X_3). At the same time, the dependent variable is the achievement of mathematics learning outcomes (Y). Systematically the research design thinking flowchart can be described as shown in the figure below:

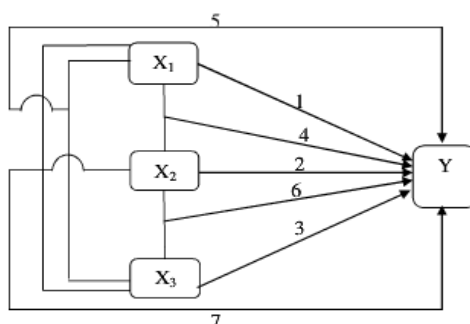


Figure I. Research Design X_1 , X_2 , X_3 and Y

Information :

X_1 : Motivation to learn

X_2 : Learning Facilities

X_3 : Independence Learning

Y : Mathematical Learning Outcomes

(Sugiyono:2010)

This research was conducted at Muhammadiyah Pakem Middle School in Sleman Regency 2016/2017 academic year because it was through an interview on 18 October 2016. Based on the interview results on that date, the researchers decided to take research data at the school, namely Muhammadiyah Pakem Middle School, Sleman Regency. The population is a general area consisting of objects or subjects with specific qualities and characteristics determined by research to be studied and conclusions drawn (Sugiyono:2015). The people in this study were students of class VIII even semester of SMP Muhammadiyah Pakem, Sleman Regency in the 2016/2017 school year, amounting to 151 students. The research sample is part of the number and characteristics possessed by the population (Sugiyono: 2015). In this study, sample selection is made using a random sampling technique that takes casual sample classes obtained by lottery class. After the draw from the population, 38 students were selected for the research sample class VIII D. For the test class VIII A were 37 students. The independent variable (independent) is often referred to as the stimulus variable, predictor, antecedent. In Indonesian, it is often called the independent variable. The independent variable is the variable that influences or is the cause of the change or the occurrence of the dependent variable (bound) (Sugiyono: 2015). X_1 : Motivation to learn, X_2 : Learning Facilities, X_3 : Independence Learning. According to Sugiyono (2015: 4), the dependent variable is a variable that is affected, or that is due, because of the independent variables. The dependent variable of this study is mathematics learning outcomes (Y). Data Collection Techniques and Instruments:

1. Data Collection Techniques
 - a. Questionnaire
 - b. Tes Techniques
2. Data Collection Instruments
 - a. Learning Motivation Questionnaire

Table 1. Student Learning Motivation Questionnaire Grid

No	Indicator	Item Question		Total
		Positive	Negative	
1	Persevering in the task	10,13,17	7,19	5
2	Resilient in the face of difficulties	2,16	6,25	4
3	Prefer to study independently	20,21	14,22	4
4	Feel bored with routine tasks	12	4,8	3
5	Happy to find and solve problems	3,18,23	5,9	5
6	It's not easy to let go of that thing believed	11,24	1,15	4
	Total	13	12	25

b. Learning Facility Questionnaire

Table 2. Learning Facility Questionnaire Grid

No	Indicator	Item Question		Total
		Positive	Negative	
1	Learning Room	1,25	2,8	4
2	Stationery or learning tools	7,13,17	9,20	5
3	Study furniture	3,16	18	3
4	Teaching media	5,11,15,21	6,19,24	7
5	Lighting	23	4	2
6	Props	10,12	14,22	4
	Total	13	12	25

c. Learning Independence Questionnaire

Table 3. Questionnaire Grid Independence Learning students

No	Indikator	Item Question		Total
		Positive	Negative	
1	Able to think critically, creatively and innovatively	5,6,23	2,11	5
2	Not easily influenced by others	9	1	2
3	Don't avoid problems	24	17,20	3
4	Solve problems by thinking deeply	25	14	2
5	When you encounter a problem, it is solved by yourself without asking for help from others	15	18,22	3
6	Don't feel inferior if you have to be different from other people	19	4	2
7	Trying to work with full perseverance and discipline	8,12	3,21	4
9	Take responsibility for his actions	10,13	7,16	4
	Total	12	13	25

d. Learning Outcomes Test

To determine the mathematics learning outcomes of eighth-grade students of the even semester of SMP Muhammadiyah Pakem, 30 multiple choice questions were used with four alternative answers: a, b, c, or d with the correct score answer being one and for the wrong answer is 0. This test score is used as a student's ability to learn. These questions involve material about building space.

3. Instrument Validity

Based on the results of the analysis of the validity test with a significance level of 5%, it is known that of the 30 items of the mathematics learning achievement test given, there are 12 invalid questions. The following summarizes the validity of the research instrument.

Table 4. Summary of Test Results of Research Instrument Validity

Variable	Number of items	Number of drop items	Item number dropped	Number of questions is valid
Mathematical learning outcomes	30	12	7,8,12,13,15,16,22,24,26,27,29,30	18

Table 5. Summary of Instrument Distinction Power Test Results

Research instrument	Kriteria soal				
	Very Good	Good	Enough	Bad	Very Bad
Problem number	0	1	17	0	0

Table 6. Summary of Instrument Reliability Test Results

No	Variable	r_{count}	r_{table}	Number of items	Status
1	Motivation to learn	0,752	0,325	25	Reliable
2	Learning facilities	0,662	0,325	25	Reliable
3	Learning independence	0,814	0,325	25	Reliable
4	Mathematical learning outcomes	1,058	0,325	18	Reliable

Descriptive data analysis is presented in the form of the lowest score, highest score, mean, median, mode, the standard deviation of each variable after it is converted to a scale reference calculation.

A normality test is carried out, aiming to determine whether the distribution is normal or not. The formula used for the Chi-Square Test, as follows:

$$\chi^2 = \sum_{i=1}^k \frac{(f_o - f_h)^2}{f_h}$$

(Sugiyono:2010)

This independence test is used to determine the relationship between students' perceptions of learning motivation (X_1), learning facilities (X_2), and independence of learning (X_3) independent or dependent. The formula used is the Chi-Square Test (χ^2) as follows:

$$\chi^2 = \sum_{i=1}^B \sum_{j=1}^K \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

(Sudjana:2002)

The linearity test is used to determine whether the relationship between independent and dependent variables is linear. The formula used is:

$$F_{count} = \frac{S^2_{TC}}{S^2_G}$$

(Sugiyono, 2015: 265-274)

In this study, using simple regression analysis and multiple regression analysis.

RESULTS AND DISCUSSION

Learning motivation data was obtained from learning motivation questionnaire scores. Totaling 25 statements so that the lowest score was 64, and the highest score was 120.

Table 7. Distribution of Learning Motivation Frequencies

Interval class	f_i	X_i	X_i^2	$f_i X_i$	$f_i X_i^2$
64-72	3	68	4624	204	13872
73-81	8	77	5929	616	47432
82-90	7	86	7396	602	51772
91-99	10	95	9025	950	90250
100-108	4	104	10816	416	43264
109-117	3	113	12769	339	38307
118-126	3	122	14884	366	44652
Total	38	665	65443	3493	329549

From the table above, obtained an average value of 91.9211 and a standard deviation of 15.1290.

To interpret the scores obtained, students are divided into three groups: good, medium, and low. From these criteria, the grouping of motivation scores is derived as follows.

Table 8. Distribution of Number of Students by Student Motivation Category

No	Criteria	Score	F ₀	%
1	Good	$X_1 > 107,0500$	6	15,7895
2	Medium	$76,7921 \leq X_1 \leq 107,0500$	27	71,0526
3	Low	$X_1 < 76,7921$	5	13,1579
	Total		38	100

From the results of the categorization, as shown in Table 8, it can be seen that the learning motivation of eighth-grade students of Even Semester SMP Muhammadiyah Pakem Sleman Regency 2016/2017 is included in the medium category because the highest frequency lies in the interval of $76.7921 \leq X \leq 107.0500$ namely as many as 27 students or 71.0526%.

Learning facilities data were obtained from learning facility questionnaire scores totaling 25 statements, so the lowest score was 60, and the highest score was 103.

Table 9. Frequency Distribution of Learning Facilities

Interval class	f _i	X _i	X _i ²	f _i X _i	f _i X _i ²
60-66	2	63	3969	126	7938
67-73	9	70	4900	630	44100
74-80	6	77	5929	462	35574
81-87	7	84	7056	588	49392
88-94	6	91	8281	546	49686
95-101	5	98	9604	490	48020
102-108	3	105	11025	315	33075
Total	38	588	50764	3157	267785

From the table above, obtained an average value of 83.0789 and a standard deviation of 12.174.

To interpret the scores obtained, students are divided into three groups: good, medium, and low. From this criterion, a grouping of learning facility scores is obtained as follows:

Table 10. Distribution of Number of Students by Student Facility Category

No	Criteria	Score	F ₀	%
1	Good	$X_2 > 95,2764$	8	21,0526
2	Medium	$70,8815 \leq X_2 \leq 95,2764$	19	50
3	Low	$X_2 < 70,8815$	11	28,9474
	Total		38	100

From the results of the categorization, as shown in Table 10, it can be seen that the learning facilities for VIII grade students of Even Semester SMP Muhammadiyah Pakem Sleman Regency 2016/2017 are included in the medium category because the highest frequency is located at intervals of $70.8815 \leq X \leq 95.2764$ namely as many as 19 students or 50%.

The learning independence data was obtained from the learning independence questionnaire score, which totaled 25 statements so that the lowest score was 68, and the highest score was 101.

Table 11. Distribution of Learning Independence Frequencies

Interval class	f _i	X _i	X _i ²	f _i X _i	f _i X _i ²
68-72	3	70	4900	210	14700
73-77	5	75	5625	375	28125
78-82	3	80	6400	240	19200
83-87	5	85	7225	425	36125
88-92	10	90	8100	900	81000
93-97	6	95	9025	570	54150
98-102	6	100	10000	600	60000

Interval class	f_i	X_i	X_i^2	$f_i X_i$	$f_i X_i^2$
Total	38	595	51275	3320	293300

From the table above, obtained an average value of 87.33684 and a standard deviation of 9.3532.

To interpret the scores obtained, students are divided into three groups: good, medium, and low. From these criteria, the grouping of motivation scores is derived as follows:

Table 12. Distribution of Number of Students by Student Independence Category

No	Criteria	Score	F_0	%
1	Good	$X_3 > 96,7216$	7	18,4211
2	Medium	$78,0152 \leq X_3 \leq 96,7216$	23	60,5263
3	Low	$X_3 < 78,0152$	8	21,0526
	Total		38	100

From the results of the categorization, as shown in Table 12, it can be seen that the learning independence of the eighth-grade students of the Even Semester of SMP Muhammadiyah Pakem Sleman in the 2016/2017 Academic Year is included in the medium category because the highest frequency lies in the interval $78,0152 \leq X \leq 96,7216$ namely as many as 23 students or 60.5263%.

Learning outcomes data obtained from the score of learning outcomes, which amounted to 30 items, so the lowest score obtained is 55.6, and the highest score is 100.

Table 13. Distribution of Learning Outcomes

Interval class	f_i	X_i	X_i^2	$f_i X_i$	$f_i X_i^2$
55,6-62,5	2	59,05	3486,903	118,1	6973,805
62,6-69,5	0	66,05	4362,603	0	0
69,6-76,5	6	73,05	5336,303	438,3	32017,82
76,6-83,5	14	80,05	6408,003	1120,7	89712,04
83,6-90,5	4	87,05	7577,703	348,2	30310,81
90,6-97,5	2	94,05	8845,403	188,1	17690,81
97,6-104,5	10	101,05	10211,1	1010,5	102111
Total	38	560,05	46228,02	3223,9	278816,3

From the table above, obtained an average value of 84.8395 and a standard deviation of 11.9710.

To interpret the scores obtained, students are divided into three groups: good, medium, and low. From these criteria, the grouping of motivation scores is derived as follows:

Table 14. Distribution of Number of Students by Learning Outcomes Category

No	Criteria	Score	F_0	%
1	Good	$Y > 96,8105$	10	26,3158
2	Medium	$72,8684 \leq Y \leq 96,8105$	20	52,6316
3	Low	$Y < 72,8684$	8	21,0526
	Total		38	100

From the results of the categorization, as shown in Table 14, it can be seen that the learning outcomes of Grade VIII students in the Even Semester of SMP Muhammadiyah Pakem Sleman in the 2016/2017 Academic Year are included in the medium category because the highest frequency lies in the interval $72,8684 \leq Y_i \leq 96,8105$ namely as many as 20 students or 52.6316%.

Table 15. Summary of Instrument Normality Test Results

No	Variable	X_{count}^2	X_{table}^2	df	Information
1	Motivation to learn	1,5546	7,8147	3	Normal
2	Learning facilities	3,6349	9,4877	4	Normal

No	Variable	X_{count}^2	X_{table}^2	df	Information
3	Learning independence	5,7796	9,4877	4	Normal
4	Mathematical learning outcomes	0,4731	5,9915	2	Normal

Table 16. Summary of Independent Test Results

No	Variable	X_{count}^2	X_{table}^2	dk	Information
1	X ₁ and X ₂	39,3765	50,9985	25	Independent
2	X ₁ and X ₃	43,8930	50,9985	25	Independent
3	X ₂ and X ₃	48,3746	50,9985	25	Independent

Table 17. Summary of Linearity Test Results

No	Variable	F_{count}	F_{table}	v ₁	v ₂	Information
1	X ₁ with Y	0,7575	2,7229	26	10	Linear
2	X ₂ with Y	1,1859	2,2756	20	16	Linear
3	X ₃ with Y	0,5362	2,2756	20	16	Linear

The purpose of this study was to determine whether or not there was a relationship between learning motivation, learning facilities, and learning independence with mathematics learning outcomes of Grade VIII students of SMP Muhammadiyah Pakem, Sleman Regency, Even Semester Academic Year 2016/2017. Based on the results of research that have been obtained and then analyzed obtained the coefficient of determination (R^2) of 0.3723, (R) of 0.6102 and the F-test obtained $F_{count} = 6,7209$ $F_{table} = 2,8826$ so $F_{count} > F_{table}$ at the 5% significance level, with numerator dk = 3 and denominator dk = 34. This can be explained through linear relationships $\hat{Y} = 10,1472 + 0,3886X_1 + 0,2961X_2 + 0,1626X_3$ with a regression direction coefficient of 0.3886 means that each increase of one unit X₁ results in 0.3886 increase in Y, each increase in one unit X₂ results in 0.2961 increase in Y and every increase in one unit X₃ results in 0.1626 increase in Y. While for relative contributions X₁ that is 59.0770%, X₂ is 29.3821% and X₃ is 11.5409% and the effective contribution is 21.9921%, X₂ is 10.9379% and X₃ is 4.2962%. With the coefficient of determination (R^2) of 0.3723, it means that the ability of the independent variables of learning motivation, learning facilities, and learning independence have a relationship of 37.23% with learning outcomes. There is a 62.77% relationship that is explained by other factors not discussed in the study. From the results of this calculation, it can be seen that the higher the motivation of learning, learning facilities, and learning independence, the learning outcomes of mathematics obtained will be better too. Thus, if students have strong motivation from within themselves to learn and are accompanied by the school or parents' complete facilities and always learn independently, the learning outcomes obtained by students will be maximized. Thus the seventh hypothesis test results are obtained that there is a positive and significant relationship between learning motivation, learning facilities, and learning independence with mathematics learning outcomes.

CONCLUSION

1. There is a positive and significant relationship between learning motivation and student mathematics learning outcomes. This is indicated by the t-test obtained $t_{count} = 3,2125$ while $t_{table} = 2.0281$ with a significant level of 5% and $dk = n-2 = 38-2 = 36$. The linear regression equation is $\hat{Y} = 48.4157 + 0.3937X_1$. This shows the higher the motivation to learn, the higher the mathematics learning outcomes of students.
2. There is a positive and significant relationship between learning facilities with student mathematics learning outcomes. This is indicated by the t-test obtained $t_{count} = 2.22664$ while $t_{table} = 2.0281$ with a significant level of 5% and $dk = n-2 = 38-2 = 36$. The linear regression equation is $\hat{Y} = 56.4359 + 0.3380 X_2$. This shows that the higher the learning facilities, the higher the mathematics learning outcomes of students.

3. There is a positive and significant relationship between learning independence and student mathematics learning outcomes. This is indicated by the t-test obtained $t_{\text{count}} = 2.2083$ while $t_{\text{table}} = 2.0281$ with a significant level of 5% and $dk = n-2 = 38-2 = 36$. The linear regression equation is $\hat{Y} = 45.2065 + 0.4515X_3$. This shows the higher the independence of learning, the higher the mathematics learning outcomes of students.
4. There is a positive and significant relationship between learning motivation and learning facilities with student mathematics learning outcomes. This is indicated by the F-test obtained $F_{\text{count}} = 9.8885$ while $F_{\text{table}} = 3.2674$ with a significance level of 5% for numerator = 2 and for denominator = 35. The linear regression equation is $\hat{Y} = 17.7678 + 0.4056X_1 + 0.3559X_2$. This shows that the higher the motivation of learning and learning facilities, the higher the mathematics learning outcomes.
5. There is a positive and significant relationship between learning motivation and learning independence with student mathematics learning outcomes. This is indicated by the F-test obtained $F_{\text{count}} = 7.5444$ while $F_{\text{table}} = 3.2674$ with a 5% significance level for the numerator = 2 and for the denominator = 35. The linear regression equation is $\hat{Y} = 19.3442 + 0.3559X_1 + 0.3700X_3$. This shows the higher motivation to learn, and the independence of learning, the higher the mathematics learning outcomes of students.
6. There is a positive and significant relationship between learning facilities and learning independence with student mathematics learning outcomes. This is indicated by the F-test obtained $F_{\text{count}} = 3.4131$ while $F_{\text{table}} = 3.2674$ with a 5% significance level for numerator = 2 and denominator $dk = 35$. The linear regression equation is $\hat{Y} = 39.6683 + 0.2309X_2 + 0.2949X_3$. This shows the higher learning facilities and learning independence, the higher the mathematics learning outcomes of students.
7. There is a positive and significant relationship between learning motivation, learning facilities, and learning independence with student mathematics learning outcomes. This is indicated by the F-test obtained $F_{\text{count}} = 6.7209$ while $F_{\text{table}} = 2.8826$ with a significant level of 5% dk numerator = 3 and denominator $dk = 34$. The correlation coefficient is (R) 6.102, while the coefficient of determination (R²) is 3723, and the linear regression equation is $\hat{Y} = 10,1472 + 0,3886X_1 + 0,2961X_2 + 0,1626X_3$. This shows that the higher the motivation of learning, learning facilities, and learning independence, the higher the mathematics learning outcomes of students.

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