

RELATIONSHIP BETWEEN LEARNING CREATIVITY, LEARNING MOTIVATION, AND SOCIAL ENVIRONMENT WITH MATHEMATICS LEARNING OUTCOMES OF CLASS XI

Oktaviani^a, Nur Arina Hidayati^b

Program Studi Pendidikan Matematika Universitas Ahmad Dahlan
Jalan Ring Road Selatan, Tamanan, Banguntapan, Bantul, Yogyakarta
^aoktavianiyani2@gmail.com, ^bnurarinahidayati@gmail.com

ABSTRACT

Mathematics is one of lesson favored by students because it seems difficult to learn math. Difficulties of student learning result in a lack of learning outcomes. With the presence of a student's creative spirit, high learning motivation, and a conducive social environment are expected to improve students' mathematics learning outcomes. This study aims to determine whether there is a relationship between learning creativity, learning motivation, and social environment with mathematics learning outcomes in students class XI Science (IPA) of State Senior High School 9 Yogyakarta (SMA Negeri 9 Yogyakarta) Year of 2016/2017. The population in this research was the students of class XI IPA grade in SMA Negeri 9 Yogyakarta in the academic year of 2016/2017, consisted of class XI IPA, XI IPA II, XI IPA III, XI IPA IV, XI IPA V, totaling 148 students. Samples were taken from XI IPA III as the research sample class and with the random sampling technique. The writer uses a questionnaire method to collect the data of learning creativity, learning motivation, and social environment 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 creativity, learning motivation, and social environment with mathematics learning outcomes in students class XI IPA of SMA Negeri 9 Yogyakarta Year of 2016/2017. It is showed by $F_{count} > F_{table}$ is $9,226 > 2,98$ with $R = 0,718$ and $R^2 = 0,516$ with $\hat{Y} = -78,786 + 0,562 X_1 + 0,389 X_2 + 0,946 X_3$, with $RC X_1 = 27,558\%$, $RC X_2 = 14,863\%$ and $RC X_3 = 57,578\%$, $EC X_1 = 14,210\%$, $EC X_2 = 7,664\%$ and $EC X_3 = 29,690\%$.

Keywords: Learning Creativity, Learning Motivation, Social Environment, Mathematics Learning Outcomes.

INTRODUCTION

Education is part of the determinant of the success of national development. Through education can be created advanced and higher quality human resources. The quality of education is related to students' quality because the central point in the learning process is students. Students are expected to gain knowledge and insight as much as possible, which will hopefully be useful. The way to measure students' ability, knowledge, and understanding about a subject in school is to look at student learning outcomes. Learning outcomes are a reflection of the learning process achieved by students after making an effort. High and low learning outcomes will contribute to achieving future success.

Based on interviews with some SMA Negeri 9 Yogyakarta students on January 10, 2017, most students considered learning mathematics difficult. The thing that makes students feel difficulty learning mathematics is because the mathematical object is abstract. Also, in certain materials, students have difficulty understanding so many formulas; it is difficult for them to understand because they consist of symbols or symbols. Difficulties in student learning outcomes will result in a lack of learning outcomes. Student learning outcomes in mathematics from the cognitive aspects of class XI IPA in SMA Negeri 9 Yogyakarta can be seen from the list of mastery learning outcomes in mathematics.

Table 1. Complete List of Mathematics Values of Grade XI Science students
SMA Negeri 9 Yogyakarta 2015/2016 Academic Year

MCC	Criteria	Class XI IPA					Percentage
		I	II	III	IV	V	
78	Complete	12	12	18	15	14	47,97%
	No Complete	18	18	12	15	14	52,02%
Total students		30	30	30	30	28	148

Mathematics is considered a complicated subject, but with the presence of a spirit of creativity, students will more easily get good learning outcomes, in line with what was stated by Wahyuningsih, Tri (2014: 942) that one of the factors that come from within students who play a role in the learning process is the child's creativity. The creative soul is where a person can be open to new experiences, and this is why student creativity is the basic capital to solve problems. In this case, creativity is a process of thinking where students can analyze problems uniquely, especially problems in the field of mathematics.

In today's world of education, it is necessary to increase students who have high learning creativity driven by self-motivation to achieve optimal learning outcomes. Learning motivation is important in the learning process of students. Because its function is to encourage, move, and direct learning activities. In line with the opinion of Jatmiko (2015: 205) which states that Active students in learning can help him find, develop, solve problems and communicate ideas that he has at the same time can foster interests and positive attitudes and foster high motivation when learning takes place. The strength of one's learning motivation also influences his success. As revealed by Jatmiko (2015: 205-206), learning conducted by teachers will undoubtedly succeed if supported by students who have positive attitudes and motivation to learn.

The environment is also the most effective and efficient learning resource. Learning can occur in the family, community, and school. The family is the most influential social environment on student learning outcomes. A child raised in a harmonious family environment, an atmosphere that provides an outpouring of affection, attention, and guidance in learning, then positively impacts the child's personality. The atmosphere of the family environment influences children's learning outcomes, the atmosphere of a noisy and chaotic home environment makes children unable to learn well at home, reinforced by the opinions of Maryati, Fitria Akhyar, and Sugiyanto (2015: 8) that The conducive learning environment will create peace and comfort for students in learning so that it can support learning activities and students will more easily achieve maximum achievement.

Based on the results of interviews with several students and mathematics teacher Mrs. Dra. Ari Winarti SMA Negeri 9 Yogyakarta on January 10, 2017, most of the creativity of students learning in class is not good. This can be seen from some students not responding to the questions asked and tend to be lazy to ask if there are things that are not understood, students do not like to analyze the questions before answering the questions. Also, in working on math problems, students only answer questions from rote learning. Students rarely use their way of doing math problems. Low motivation to learn was also seen for some students at SMA Negeri 9 Yogyakarta because students lacked the tenacious nature of facing difficulties with various problems, seen from their responses when given assignments. Then, students are not motivated to solve problems independently with a higher level of difficulty than the examples of questions that have been given so that it can be concluded that some students are not tenacious in facing difficulties and are not diligent in facing assignments.

Some students express the social environment in families that are less conducive because of the lack of comfort in studying at home and often bored at home. As for some students who do not live with parents due to migrating, there is a lack of good relations between students and parents. The relation in question is the attention of parents. This can result in children's learning development tends to below. Because according to mathematics teacher Mrs. Dra. Ari Winarti SMA Negeri 9 Yogyakarta very

important thing is the relationship between families and students, especially parents, in monitoring children's learning at home.

Based on the background description above, the researcher is motivated to research The Relationship between Learning Creativity, Learning Motivation, and the Social Environment With Mathematics Learning Outcomes of Class XI Science Students at SMA Negeri 9 Yogyakarta 2016/2017 Academic Year. The objectives to be achieved from the results of research conducted to find out whether or not there is a positive and significant relationship between learning creativity, learning motivation, and the social environment with the mathematics learning outcomes of students of class XI IPA SMA Negeri 9 Yogyakarta 2016/2017 academic year.

METHODS

Research is included in quantitative research, so the type of research is quantitative research. This study aims to determine whether there is a positive or negative and significant relationship between learning creativity, motivation to learn, and the social environment with mathematics learning outcomes of students of class XI IPA even semester SMA Negeri 9 Yogyakarta, then systematically the flow of thinking design research can be described as a picture below this:

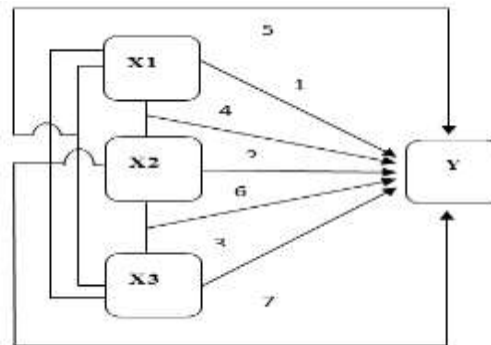


Figure I. Research design

This research was conducted in class XI IPA SMA Negeri 9 Yogyakarta in 2015/2016, namely, in May 2017. The population in this study were students of class XI IPA of SMA Negeri 9 Yogyakarta in the 2016/2017 school year, amounting to 148 students and consisted of 5 classes. The sampling technique in this study is a random sampling technique for class. Sampling is done by lottery class. The class taken as a sample class is class XI IPA III. In this study, four variables are consisting of 3 independent variables, namely learning creativity (X_1), learning motivation (X_2), social environment (X_3), and one dependent variable, namely mathematics learning outcomes (Y). Data collection techniques in this study were the non-test method and the test method. Simultaneously, the data collection instruments in this study were questionnaires and mathematics achievement test questions. In this study, the class taken as a test class is Class XI Natural Science I. The test instrument used in this study is the validity test. Data analysis technique are:

1. Descriptive Data Analysis
2. Testing the Analysis Prerequisites
 - a. Normality test
 - b. Independent Test
 - c. Linearity Test
3. Hypothesis Test

RESULTS AND DISCUSSION

- Learning Creativity Data. Student learning creativity class XI IPA III SMA Negeri 9 Yogyakarta Academic Year 2016/2017 is included in the medium category because the greatest frequency lies in the interval $66.311 \leq X \leq 87.355$, namely as many as 22 students or 73,333%.
- Learning Motivation Data. The learning motivation of students of class XI IPA III of SMA Negeri 9 Yogyakarta in the 2016/2017 Academic Year is included in the medium category because the greatest frequency lies in the interval of $60.903 \leq X \leq 82.897$ namely as many as 18 students or 60%.
- Social Environmental Data. Social Environment class XI IPA III students of SMA Negeri 9 Yogyakarta Academic Year 2016/2017 are included in the medium category because the greatest frequency is located at an interval of $61.741 \leq X \leq 87.459$ namely 23 students or 76.667%.
- Mathematics Learning Outcomes Data. Mathematics learning outcomes of students of class XI IPA III of SMA Negeri 9 Yogyakarta in the 2016/2017 Academic Year are included in the low category because the greatest frequency lies in the X interval < 78 , as many as 23 students or 76.667%.

Based on the normality test results, it was found that the variables of learning creativity, learning motivation variables, social environment variables, mathematics learning outcomes variables were normally distributed. The normality test results for the four variables can be seen in Table 2

Table 2. Normality Test Results

Variable	χ^2_{count}	χ^2_{table}	Df	Conclusion
Learning Creativity (X_1)	1,098	5,992	2	Normal
Motivation to learn (X_2)	1,184	7,815	3	Normal
Social environment (X_3)	3,363	7,815	3	Normal
Mathematical Learning Outcomes (Y)	1,753	7,815	3	Normal

Based on the results of the independence test results show that the learning creativity variable (X_1) with learning motivation variable (X_2), learning creativity variable (X_1) with social environment variable (X_3), learning motivation variable (X_2) with social environment variable (X_3) are independent. Independent test results can be seen in Table 3.

Table 3. Independent Test Results

Variable	χ^2_{hit}	χ^2_{tab}	df	Conclusion
X_1 and X_2	32,438	37,652	25	Independent
X_1 and X_3	31,951	37,652	25	Independent
X_2 and X_3	29,236	37,652	25	Independent

Based on the results of the linearity test, it is found that the creativity of learning with the results of learning mathematics is linearly related, the motivation to learn with the results of learning mathematics is linearly related, the social environment with the results of learning mathematics is linearly related. The results of the linearity test can be seen in Table 4.

Table 4. Linearity Test Results

Variable	F_{count}	F_{table}	Conclusion
X_1 with Y	0,768	2,60	Linear
X_2 with Y	0,625	2,69	Linear
X_3 with Y	1,375	2,69	Linear

Hypothesis Test Results:

- Testing the first hypothesis. $t_{count} = 2.800 > t_{table} = 1.701$, then $H_{0,1}$ is rejected, and $H_{1,1}$ is accepted, so there is a positive and significant relationship between learning creativity and mathematics learning outcomes of students of class XI IPA in SMA Negeri 9 Yogyakarta 2016/2017 school year.

- b. Testing the second hypothesis. $t_{count} = 1.931 > t_{table} = 1.701$, then $H_{0,2}$ is rejected, and $H_{1,2}$ is accepted. There is a positive and significant relationship between learning motivation and mathematics learning outcomes of students of class XI IPA in the SMA Negeri 9 Yogyakarta 2016/2017 school year.
- c. Third hypothesis testing. $t_{count} = 3.060 > t_{table} = 1.701$, then $H_{0,3}$ is rejected, and $H_{1,3}$ is accepted, so there is a positive and significant relationship between the social environment and mathematics learning outcomes of students of class XI IPA SMA Negeri 9 Yogyakarta in 2016/2017 school year.
- d. Testing the fourth hypothesis. $F_{count} = 4.476 > F_{table} = 3.35$, then $H_{0,4}$ is rejected, and $H_{1,4}$ is accepted, so there is a positive and significant relationship between learning creativity and learning motivation with mathematics learning outcomes of students of grade XI IPA of SMA Negeri 9 Yogyakarta 2016/2017 school year.
- e. Testing the fifth hypothesis. $F_{count} = 9.607 > F_{table} = 3.35$, then $H_{0,5}$ was rejected, and $H_{1,5}$ was accepted, so there is a positive and significant relationship between learning creativity and the social environment with the mathematics learning outcomes of students of class XI IPA in SMA Negeri 9 Yogyakarta 2016/2017 school year.
- f. Testing the sixth hypothesis. $F_{count} = 7.850 > F_{table} = 3.35$, then $H_{0,6}$ was rejected, and $H_{1,6}$ was accepted, so there is a positive and significant relationship between learning motivation and social environment with the mathematics learning outcomes of students of class XI IPA SMA, Negeri 9 Yogyakarta 2016/2017.
- g. Testing the seventh hypothesis. $F_{count} = 9.226 > F_{table} = 2.98$, then $H_{0,7}$ is rejected, and $H_{1,7}$ is accepted, so there is a positive and significant relationship between learning creativity, learning motivation, and social environment with mathematics learning outcomes of students of class XI IPA of SMA Negeri 9 Yogyakarta in the school year 2016/2017.

After the research data has been collected and analyzed, further discussion of the study results is carried out, based on the hypothesis test, this study finds that:

1. The first hypothesis test result is that there is a positive and significant relationship between learning creativity with mathematics learning outcomes, in the test results obtained that the simple correlation coefficient (r) of 0.468 which can be interpreted that the relationship of learning creativity with learning outcomes in mathematics is strong enough at a significant level of 5%. So we get the determinant coefficient (r^2) of 0.219, which can be explained that 21.9% of learning outcomes are influenced by learning creativity. There is a variation in mathematics learning outcomes (Y) explained by learning creativity (X_1) through a linear line $\hat{Y} = -3,818 + 0,866 X_1$, with a regression coefficient of 0.866. This means that each increase of one unit X_1 results in a 0.866 increase in Y .
2. The second hypothesis test result is that there is a positive and significant relationship between learning motivation and mathematics learning outcomes. In the hypothesis testing results obtained correlation coefficient (r) 0.343, which can be interpreted that the relationship of learning motivation with mathematics learning outcomes is low at a significant level of 5%. To obtain a determinant coefficient (r^2) of 0.117, which can be explained that 11.7% of learning outcomes are influenced by learning motivation. There is a variation in mathematics learning outcomes (Y) explained by learning motivation (X_2) through a linear line $\hat{Y} = 19,040 + 0,596 X_2$, with a coefficient of regression direction of 0.596. This means that every increase of one unit X_2 results in a 0.596 increase in Y .
3. The third hypothesis test result is that there is a positive and significant relationship between the social environment and mathematics learning outcomes. In the hypothesis testing results obtained correlation coefficient (r) of 0.501, which can be interpreted that the relationship of the social environment with mathematics learning outcomes is quite strong—so obtained (r^2) of 0.251, which can be explained that the social environment influences 25.1% of learning outcomes. There is a variation in mathematics learning outcomes (Y) explained by the social environment (X_3)

through a linear line $\hat{Y} = 3,281 + 0,798 X_3$ with a coefficient of regression direction of 0.798. This means that every increase of one unit X_3 results in a 0.798 increase in Y .

4. The fourth hypothesis test result is that there is a positive and significant relationship between learning creativity and learning motivation with mathematics learning outcomes. The multiple correlation analysis obtained the value of the multiple correlation coefficient (R) of 0.499, which can be interpreted that the relationship of learning creativity and learning motivation with mathematics learning outcomes is quite strong. This study also obtained a coefficient of determination (R^2) of 0.249, meaning that 24.9% of learning outcomes are influenced by learning creativity and learning motivation. There are variations in mathematics learning outcomes (Y) that can be explained by learning creativity (X_1) and learning motivation (X_2) through linear lines $\hat{Y} = -17,242 + 0,729 X_1 + 0,329 X_2$. This means an increase in one unit (X_1) resulted in a 0.729 increase in Y , and an increase in one unit (X_2) resulted in a 0,329 increase in Y . While for relative contributions X_1 amounted to 73,974% and X_2 amounted to 26,025% and effective contribution of X_1 amounted to 18,421% and X_2 amounted to 6,481%.
5. The fifth hypothesis test results are that there is a positive and significant relationship between learning creativity and the social environment with learning outcomes in mathematics. From the multiple correlation analysis, it is obtained the value of the multiple correlation coefficient (R) of 0.645, which can be interpreted that the relationship of learning creativity and social environment with mathematics learning outcomes is strong. This study also obtained a coefficient of determination (R^2) of 0.416, which means that 41.6% of learning outcomes are influenced by learning creativity and the social environment. There are variations in mathematics learning outcomes (Y) that can be explained by learning creativity (X_1) and social environment (X_3) through linear lines $\hat{Y} = -48,415 + 0,759 X_1 + 0,714 X_3$. This means an increase in one unit (X_1) results in a 0.759 increase in Y , and an increase in one unit (X_3) resulted in a 0.714 increase in Y . The relative contribution of X_1 by 46,106% and X_3 by 53,894% and the effective contribution of X_1 by 19.1690% and X_3 by 22.407%.
6. The sixth hypothesis test results are that there is a positive and significant relationship between learning motivation and the social environment with mathematics learning outcomes. From the multiple correlation analysis, it is obtained the value of the multiple correlation coefficient (R) of 0.606, which can be interpreted that the relationship of learning motivation and social environment with mathematics learning outcomes is strong. This study also obtained a coefficient of determination (R^2) of 0.368, meaning 36.8% of learning outcomes are influenced by learning motivation and social environment. There are variations in mathematics learning outcomes (Y), which can be explained by learning motivation (X_2) and social environment (X_3) through linear lines $\hat{Y} = -39,853 + 0,596 X_2 + 0,797 X_3$. This means an increase in one unit (X_2) resulted in a 0.596 increase in Y , and an increase in one unit (X_3) resulted in a 0.797 increase in Y . While for relative contributions X_2 amounted to 31,907% and X_3 amounted to 68,093% and effective contributions of X_2 amounted to 11,732% and X_3 by 25,037%.
7. The seventh hypothesis test results are that there is a positive and significant relationship between learning creativity, learning motivation, and social environment with learning outcomes in mathematics. From the multiple correlation analysis, it is obtained the value of the multiple correlation coefficient (R) of 0.718, which can be interpreted that the relationship of learning creativity, learning motivation, and social environment with mathematics learning outcomes is strong. This study also obtained a coefficient of determination (R^2) of 0.516, meaning 51.6% influenced by learning creativity, learning motivation, and social environment. Variations in mathematics learning outcomes (Y) can be explained by learning creativity (X_1), learning motivation (X_2), and social environment (X_3) through a linear line $\hat{Y} = -78,786 + 0,562 X_1 + 0,389 X_2 + 0,946 X_3$. This means an increase in one unit (X_1) resulted in a 0.562 increase in Y , an increase in one unit (X_2) resulted in 0,389 increase in Y , and an increase in one unit (X_3) resulted in

a 0,946 increase in Y. While for the relative contribution of X_1 by 27,558%, X_2 amounted to 14,863% and X_3 amounted to 57.578% and effective contribution X_1 amounted to 14.210%, X_2 amounted to 7.664% and X_3 amounted to 29.690%, where the contribution of relative and effective contributions between independent variables can be seen in Figure 2, as follows:

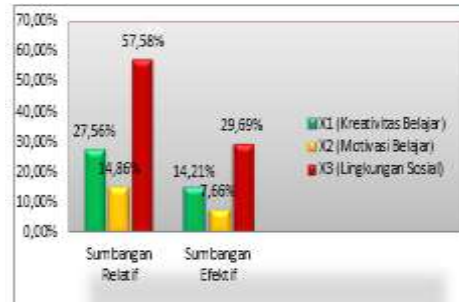


Figure 2. Graph of Relative and Effective Donations between Independent Variables

The above shows that the social environment provides the most significant contribution to learning outcomes in mathematics than learning creativity and learning motivation. With a value (R^2) of 0.516, it can be concluded that 51.6% of mathematics learning outcomes are influenced by learning creativity, learning motivation, and social environment. In comparison, the remaining 48.4% is influenced by other factors not examined in the study.

CONCLUSION

Based on the results of the study, it can be concluded that there is a positive and significant relationship between learning creativity, learning motivation, and social environment with the learning outcomes of students of class XI IPA SMA Negeri 9 Yogyakarta Academic Year 2016/2017.

REFERENCES

- Arikunto, Suharsimi. 2012. *Dasar-dasar Evaluasi Pendidikan*. Jakarta: PT Bumi Aksara.
- Jatmiko. 2015. *Hubungan Motivasi Belajar dengan Hasil Belajar Matematika Siswa Kelas X SMK Nahdatul Ulama Pace Nganjuk*. Jurnal Math Educator Nusantara. Vol.1, No.2. <http://download.portalgaruda.org/article.php?article=400325&val=6717&title=HUBUNGAN%20MOTIVASI%20BELAJAR%20DENGAN%20HASIL%20BELAJAR%20MATEMATIKA%20%20SISWA%20KELAS%20X%20SMK%20NAHDHATUL%20ULAMA%20PACE%20NGANJUK>. Diunduh pada tanggal 1 Juli 2017. Pukul 19.15
- Maryati, Fitria Akhyar, dan Sugiyanto. 2015. *Hubungan antara Lingkungan Belajar dan Minat Belajar dengan Hasil Belajar Matematika Siswa*. Jurnal Padagogik. Vol.3, No.6. <http://download.portalgaruda.org/article.php?article=373248&val=7239&title=HUBUNGAN%20ANTARA%20LINGKUNGAN%20DAN%20MINAT%20BELAJAR%20DENGAN%20HASIL%20BELAJAR%20MATEMATIKA%20SISWA>. Diunduh pada tanggal 1 Juli 2017. Pukul 23.21
- Riduwan dan Sunarto. 2011. *Pengantar Statistika Untuk Penelitian: Pendidikan, Sosial, Komunikasi, Ekonomi, dan Bisnis*. Bandung: Alfabeta
- Wahyuningsih, Tri. 2014. *Hubungan antara Kreativitas Siswa, Kemandirian Belajar, dan Lingkungan Belajar di Rumah dengan Hasil Belajar Matematika Siswa Kelas VIII Semester Genap SMP Muhammadiyah 8 Yogyakarta Tahun Ajaran 2013/2014*. Jurnal Pendidikan Matematika, Ilmu Matematika dan Matematika Terapan. Vol.1, No.4.