THE RELATIONSHIP BETWEEN CLASSMATES INTERACTION, MATHEMATICS LEARNING MOTIVATION, AND NUMERICAL ABILITY WITH MATHEMATICS LEARNING OUTCOMES IN STUDENTS CLASS VIII

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ABSTRACT

The lack of classmates interaction, lack of motivation to learn mathematics, and low numerical ability in SMP Muhammadiyah 9 Yogyakarta were supposed to influence students' mathematics learning. This research aims to know if there is a positive and significant relationship between classmate's interaction, mathematics learning motivation, and numerical ability with mathematics learning outcomes in student class VIII of even semester at SMP Muhammadiyah 9 Yogyakarta academic year 2016/2017. This study population is all eighth-grade students of SMP Muhammadiyah 9 Yogyakarta academic year 2016/2017, which consists of 5 classes with a total of 160 students. Sampling using a random sampling technique to obtained class VIIIC as a sample of a total of 34 students. Data collection instruments using questionnaires technique and test. Test instrument using validity, different test test, and reliability test. Analysis prerequisite test including normality test, linearity test, and independent test. Data analysis for hypothesis testing using simple correlation analysis and multiple regression analysis. The results showed that itive and significant relationships between classmates' interaction, mathematics learning motivation, and numerical ability with mathematics learning outcomes. The significant level of 5%, $v_1 = 3$ and $v_2 = 30$ it shows that F_{hitung} = 20,5505 and F_{tabel} = 2,9223 so $F_{hitung} > F_{tabel}$, with multiple correlation coefficient of 0,8279 and the regression equation $\hat{Y} = -7{,}8262 + 0{,}2759\,X_1 + 0{,}2246\,X_2 + 0{,}5560\,X_3$. The result of determination coefficient of 0,6855 and relative contribution (X_1) = 13,8625%, (X_2) = 8,8713%, (X_3) = 77,2662% and effective contribution (X_1) = 9,3250%, (X_2) = 5,9675%, (X_3) = 51,9749% .

Keywords: classmates interaction, mathematics learning motivation, numerical ability, and mathematics learning outcomes.

INTRODUCTION

Education is very important for humans because every human being has the right to get a proper education. Education takes place continuously for a lifetime and is obtained not only through formal institutions but obtained through non-formal institutions both within the family and community. Understanding education, according to Mudyaharjo in Binti Maunah (2009: 1). Education is all learning experiences that take place in all environments and throughout life. Education is all life situations that affect individual growth. Each country has its own educational goals, especially Indonesia. According to Law Number 20 of 2003 concerning the National Education System. Education aims to develop students' potential to become human beings who believe and devote to God Almighty, have good character, be healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens.

In the era of globalization, the development of advanced technology is increasingly rapid so that the progress and development of technology will influence the field of education. In the field of education, mathematics has an important role in daily life both directly and indirectly, but for some students, consider mathematics is a complicated and boring subject. Hence, students who have difficulty learning mathematics need extra thinking to understand math.

One that affects student learning activities is the interaction between students and classmates or often referred to as classmates interaction. Many activities carried out by students with classmates start

from positive and harmful activities. Positive activities can be done by learning together or discussing lessons that are not yet understood, while harmful activities such as having fun talking with classmates while the teacher is explaining mathematics lessons. Even when teachers give assignments to work in groups, they are less interested in doing the assignment because only a few do it seriously, even if some students discuss other chats outside of mathematics or are preoccupied with their activities.

Based on the results of an interview conducted at Muhammadiyah 9 Yogyakarta Middle School with Margiyati, S.Pd, M.Pd, one of the mathematics teachers on October 27, 2016. Student interactions with classmates occurred during group discussions, even though during group discussions, there was talk that deviates from the material being discussed. When the process of learning mathematics, some students have not had a good interaction with classmates. They are still embarrassed to ask their friends if they have difficulty in mathematics, even they are just silent and tend to let it go if they do not understand mathematics. Besides that, some students bothered their friends who were watching and listening to the teacher's explanation.

Learning motivation is very important in learning mathematics because motivation plays a role in fostering the enthusiasm and willingness of students to learn mathematics and continue learning mathematics. Based on the results of interviews with Ms. Margiyati S.Pd, M.Pd. said that she motivated students to be happy to learn mathematics by motivating students at the beginning of lessons, linking lessons in daily life it looks more exciting and reminiscent of previous lessons. When learning activities are taking place, and some students are getting bored or are no longer concentrating during mathematics lessons, they will invite students to focus on the subject matter and learning objectives. He increased students' motivation to learn mathematics by various activities including, direct learning of mathematics, using teaching aids, and fun games.

Numerical ability is very important in learning mathematics because the numerical ability is needed in solving mathematical problems. According to Ms. Margiyati S.Pd, M.Pd. said that many students still get less than optimal scores. That is because students still have difficulty in the concept of operating numbers and still making mistakes in operating numbers. The result is an impact on low mathematics learning outcomes. Indicators of low mathematics learning outcomes can be seen from the value of Odd Semester Midterm odd semester that is achieved by students is still low. This is indicated by the students' numerical scores, which are still below the Minimum Mastery Criteria (MMC), which is 70.

Table 1. Value of Middle Repeat Mathematics Semester Even Semester Muhammadiyah 9 Yogyakarta Middle School 2016/2017 Academic Year

Class	VIIIA	VIIIB	VIIIC	VIIID	VIIIE
Highest score	65	85	95	71	70
Lowest score	50	50	65	61	60
Mean	56,7333	57,5000	76,1765	65,0571	63,3103
Complete	0	1	25	1	1
Not Complete	30	31	9	34	28
Total students	30	32	34	35	29

(Source: SMP Muhammadiyah 9 Yogyakarta)

Based on the description above, the problems in this study can be formulated as follows:

1. Is there a positive and significant relationship between classmate's interaction with mathematics learning outcomes for students of class VIII in the even semester of SMP Muhammadiyah 9 Yogyakarta 2016/2017 school year?

2. Is there a positive and significant relationship between mathematics learning motivation and mathematics learning outcomes for students of class VIII in the even semester of SMP Muhammadiyah 9 Yogyakarta 2016/2017 school year?
3. Is there a positive and significant relationship between numerical ability and mathematics learning outcomes for students of class VIII in the even semester of SMP Muhammadiyah 9 Yogyakarta 2016/2017 school year?
4. Is there a positive and significant relationship between classmates' interaction and motivation to learn mathematics with mathematics learning outcomes of class VIII students in the even semester of SMP Muhammadiyah 9 Yogyakarta 2016/2017 school year?
5. Is there a positive and significant relationship between classmate interaction and numerical ability with mathematics learning outcomes for students of class VIII in the even semester of SMP Muhammadiyah 9 Yogyakarta 2016/2017 school year?
6. Is there a positive and significant relationship between mathematics learning motivation and numerical ability with mathematics learning outcomes for students of class VIII in the even semester of SMP Muhammadiyah 9 Yogyakarta 2016/2017 school year?
7. Is there a positive and significant relationship between classmates' interaction, learning motivation, and numerical ability with mathematics learning outcomes for students of class VIII in the even semester of SMP Muhammadiyah 9 Yogyakarta 2016/2017 school year?

Based on the problem formulation above, the objectives of this study are as follows:

1. To determine whether there is a positive and significant relationship between classmates' interaction with mathematics learning outcomes of students of class VIII in the even semester of SMP Muhammadiyah 9 Yogyakarta 2016/2017 school year.
2. To determine whether or not there is a positive and significant relationship between mathematics learning motivation and mathematics learning outcomes of eighth-grade students of the even semester of SMP Muhammadiyah 9 Yogyakarta 2016/2017 school year.
3. To determine whether or not there is a positive and significant relationship between numerical ability and mathematics learning outcomes of eighth-grade students of the even semester of SMP Muhammadiyah 9 Yogyakarta 2016/2017 school year.
4. To find out whether or not there is a positive and significant relationship between classmates' interaction and mathematics learning motivation with mathematics learning outcomes for eighth-grade students of the even semester of SMP Muhammadiyah 9 Yogyakarta 2016/2017 school year.
5. To determine whether or not there is a positive and significant relationship between classmate's interaction and numerical ability with mathematics learning outcomes for students of class VIII in the even semester of SMP Muhammadiyah 9 Yogyakarta 2016/2017 school year.
6. To find out whether or not there is a positive and significant relationship between mathematics learning motivation and numerical ability with mathematics learning outcomes of students of class VIII in the even semester of SMP Muhammadiyah 9 Yogyakarta 2016/2017 school year.
7. To find out whether or not there is a positive and significant relationship between classmates' interaction, learning motivation, and numerical ability with mathematics learning outcomes for students of class VIII even semester of SMP Muhammadiyah 9 Yogyakarta 2016/2017 school year.

METHODS

This research is quantitative. The research site was conducted at Muhammadiyah 9 Junior High School in Yogyakarta, while the research was conducted in the even semester of the 2016/2017 school year. The population in this study were all eighth-grade students of SMP Muhammadiyah 9 Yogyakarta, even semester 2016/2017 academic year, totaling 160 students divided into five classes, namely VIIIA, VIIIB, VIIIC, VIIID, VIIIE. In this study, the sampling technique using random sampling techniques. Sampling was carried out using random sampling techniques by drawing five classes and choosing one

class, VIII C, as the research sample. In this study, there are two types of research variables, namely the independent variable (Independent) and the dependent variable (dependent). The independent variables in this study consisted of classmates' interactions (X_1), mathematics learning motivation (X_2), and numerical ability (X_3), while the dependent variable in this study consisted of mathematics learning outcomes (Y). Data collection techniques used a questionnaire technique to obtain data on classmates' interaction and motivation to learn mathematics. The test technique was to obtain data on numerical abilities and mathematics learning outcomes of Grade VIII students of SMP Muhammadiyah 9 Yogyakarta.

Analysis of the questionnaire trial and test uses content validity tests by reviewers and product-moment correlation techniques. According to (Arikunto, Suharsimi, 2013: 213) product-moment correlation techniques with the formula:

$$r_{xy} = \frac{n\sum_{i=1}^{n} x_i y_i - (\sum_{i=1}^{n} x_i)(\sum_{i=1}^{n} y_i)}{\sqrt{\{n\sum_{i=1}^{n} {x_i}^2 - (\sum_{i=1}^{n} x_i)^2\}}\sqrt{\{n\sum_{i=1}^{n} {y_i}^2 - (\sum_{i=1}^{n} y_i)^2\}}}$$

The difference power test uses the discrimination index formula, while for the reliability test, the questionnaire instrument uses the Alpha Cronbach formula and for the test instrument uses the KR-20 formula. After the data has been collected, an analysis prerequisite test will be carried out, including the normality test, linearity test, and independence test. To test the hypothesis using the t-test and F-test. For the t-test according to (Sudjana, 2001: 380) using the formula:

$$t_{count} = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$$

With r: correlation coefficient

n: number of samples

for the F-test according to (Sugiyono, 2015: 266) using the formula:

$$F = \frac{R^2/k}{(1-R^2)/(n-k-1)}$$

With F: Price F of the regression line

R^2: Coefficient of multiple correlations

n: Sample size

k: The number of independent variables

RESULTS AND DISCUSSION

Based on the discussion of this research obtained:

1. The first hypothesis test result is that there is a positive and significant relationship between classmates interaction with mathematics learning outcomes obtained by a simple correlation coefficient (r) of 0.3943 at a significant level of 5%, df = 32 shows that $t_{count} = 2{,}4272$ so $t_{count} > t_{table}$, with the regression equation is $\hat{Y}$ = 33,1765 + 0,4600 X_1. This means that each increase in one unit X_1 results in a 0.4600 increase in Y. The results of these calculations indicate that with increasing classmate interaction, mathematics learning results will increase.
2. The results of the second hypothesis test are that there is a positive and significant relationship between mathematics learning motivation with mathematics learning outcomes obtained by a simple correlation coefficient (r) of 0.3281 at a significant level of 5%, df = 32 shows that $t_{count} = 1{,}9648$ so $t_{count} > t_{table}$, the regression equation is $\hat{Y} = 39{,}5976 + 0{,}4052X_1$. This means that every increase of one unit X_1 results in 0.4052 an increase in Y. These calculations indicate that with increased motivation to learn mathematics, mathematics learning outcomes will increase.
3. The results of the third hypothesis test are that there is a positive and significant relationship between numerical ability and mathematics learning outcomes obtained a simple correlation coefficient (r) of 0.7347 at a significant level of 5% df = 32 shows that $t_{count} = 6{,}1266$ so $t_{count} > t_{table}$, with the regression equation is $\hat{Y} = 35{,}3274 + 0{,}5774X_3$. This means that every

increase of one unit X_1 results in a 0.5774 increase in Y. The results of these calculations indicate that with the increase in numerical ability, mathematics learning outcomes will increase.

4. The fourth hypothesis test results are that there is a positive and significant relationship between classmates interaction and mathematics learning motivation with mathematics learning outcomes obtained by a multiple correlation coefficient (*R*) of 0.4200 at a significant level of 5%, $v_1 = 2$ and $v_2 = 31$ shows that Fcount = 3.3189 so $F_{count} > F_{table}$, with the regression equation $\hat{Y}$ = 24,2606 + 0,3577 X_1 + 0,2087 X_2. While the relative contribution of X_1 is 68.5551%, and the relative contribution of X_2 is 31.44449%, and the effective contribution X_1 is 12.0904%, and the effective contribution X_2 is 5.5456%. This means that every increase in one unit X_1 results in 0.3577 increase in Y, and every increase in one unit X_2 results in a 0.2087 increase in Y. The results of these calculations indicate that with increasing classmate's interactions and motivation to learn mathematics, the mathematics learning outcomes will increase.
5. The fifth hypothesis test results are that there is a positive and significant relationship between classmates interaction and numerical ability with mathematics learning outcomes obtained by a multiple correlation coefficient (*R*) of 0.8053 at a significant level of 5%, $v_1 = 2$ and $v_2 = 31$ shows that $F_{count} = 28{,}5978$ so $F_{count} > F_{table}$, with the regression equation $\hat{Y}$ = 1,8748 + 0,3862 X_1 + 0,5541 X_3. While the relative contribution of X_1 was 20.1284%, and the relative contribution of X_3 was 79.8716%, and the effective contribution was 13.0534%, and the effective contribution was 51.7974%. This means that every increase in one unit X_1 results in 0.3862 increase in Y, and every increase in one unit X_3 results in a 0.5541 increase in Y. The results of these calculations indicate that with increasing classmates' interactions and numerical abilities, the mathematics learning outcomes will increase.
6. The sixth hypothesis test results are that there is a positive and significant relationship between mathematics learning motivation and numerical ability with mathematics learning outcomes obtained by a multiple correlation coefficient (*R*) of 0.7950 at a significant level of 5%, $v_1 = 2$ and $v_2 = 31$ shows that $F_{count} = 26{,}6310$ so $F_{count} > F_{table}$, the regression equation is $\hat{Y}$ = 3,1388+ 0,3754 X_2 + 0,5695 X_3. While the relative contribution of X_2 was 15.7783%, and the relative contribution of X_3 was 84.2217%, and the effective contribution of X_2 was 9.9735%, and the effective contribution of X_3 was 53.2365%. This means that every increase in one unit X_2 results in 0.3754 increase in Y, and every increase in one unit X_3 results in a 0.5695 increase in Y. The results of these calculations indicate that with increased motivation to learn mathematics and numerical ability, the results of learning mathematics will increase.
7. The seventh hypothesis test results are that there is a positive and significant relationship between mathematics learning motivation, mathematics learning motivation and numerical ability with mathematics learning outcomes obtained by a multiple correlation coefficient (R) of 0.8202 at a significant level of 5%, $v_1 = 3$ and $v_2 = 30$ shows that $F_{count} = 20{,}5505$ so $F_{count} > F_{table}$, with the regression equation is $\hat{Y}$ = − 7,8262 + 0,2759X_1 + 0,2246X_2 + 0,5560X_3. While X_1 relative contribution is 13.8625%, X_2 relative contribution is 8.8713%, and X_3 relative contribution is 77.2662% and X_1 effective contribution is 9.33250%, X_2 effective contribution is 5.9675%, and effective contribution X_3 of 51.9749%. In this study also obtained a coefficient of determination (R^2) of 0.6727. The numerical ability variable (X_3) gives the biggest contribution compared to classmates interaction variable (X_1) and mathematics learning motivation (X_2), namely the relative contribution of X_3 by 77.2662% and the effective contribution of X_3 51.9749%. The results of this study are the results of research conducted by Putri and Rahmawati (2015), which is the variable of numerical ability giving the biggest contribution to the variables of parents' attention and motivation to learn mathematics. This means that each increase of one unit X_1 results in 0.2549 increase in Y, each increase in one unit X_2 results in 0.2360 increase in Y, and each increase in one unit X_3 results in 0.5871 increase in Y. The results of these calculations indicate that with increasing interaction of classmates, motivation to learn mathematics, and numerical ability, the results of learning mathematics will increase.

CONCLUSION

Based on the research results and discussion described in Chapter IV, the following conclusions can be obtained:

1. There is a positive and significant relationship between classmates interaction with mathematics learning outcomes of VIII grade even semester of SMP Muhammadiyah 9 Yogyakarta 2016/2017 academic year obtained a simple correlation coefficient (r) of 0.3943 at a significant level of 5% with the regression equation is $\hat{Y}$ = 33,1765 + 0,4600 X_1.
2. There is a positive and significant relationship between mathematics learning motivation with mathematics learning outcomes for VIII grade even semester of SMP Muhammadiyah 9 Yogyakarta 2016/2017 academic year obtained a simple correlation coefficient (r) of 0.3281 at a significant level of 5% with the regression equation is $\hat{Y}$ = 39,5976 + 0,4052 X_1.
3. There is a positive and significant relationship between numerical ability and mathematics learning outcomes of class VIII even semester of SMP Muhammadiyah 9 Yogyakarta 2016/2017 academic year obtained a simple correlation coefficient (r) of 0.7347 at a significant level of 5% with the regression equation is $\hat{Y}$ =35,3274 + 0,5774X_3.
4. There is a positive and significant relationship between classmates interaction and mathematics learning motivation with mathematics learning outcomes of VIII grade even semester of SMP Muhammadiyah 9 Yogyakarta 2016/2017 academic year obtained a double correlation coefficient (R) of 0.4200 at a significant level of 5% with the regression equation is $\hat{Y}$ = 24,2606 + 0,3577 X_1 + 0,2087 X_2. While the relative contribution of X_1 amounted to 68.5551% and the relative contribution of X_2 31.4449% and the effective contribution of X_1 amounted to 12.0904% and the effective contribution of X_2 amounted to 5.5456%.
5. There is a positive and significant relationship between classmates interaction and numerical ability with mathematics learning outcomes of class VIII even semester of SMP Muhammadiyah 9 Yogyakarta 2016/2017 academic year obtained a double correlation coefficient (R) of 0.8053 at a significant level of 5% with the regression equation being $\hat{Y}$ = 1,8748 + 0,3862 X_1 + 0,5541 X_3. While the relative contribution of X_1 was 20.1284%, and the relative contribution of X3 was 79.8716%, and the effective contribution was 13.0534%, and the effective contribution was 51.7974%.
6. There is a positive and significant relationship between mathematics learning motivation and numerical ability with mathematics learning outcomes of class VIII even semester of SMP Muhammadiyah 9 Yogyakarta 2016/2017 academic year obtained a double correlation coefficient (R) of 0.7950 at a significant level of 5% with the regression equation is $\hat{Y}$ = 3,1388+ 0,3754 X_2 + 0,5695 X_3. While the relative contribution of X_2 was 15.3166%, while the relative contribution of X_2 was 15.77783%, and the relative contribution of X_3 was 84.2217%, and the effective contribution of X_2 was 9.99735%, and the effective contribution of X_3 was 53.2365%.
7. There is a positive and significant relationship between mathematics learning motivation, mathematics learning motivation and numerical ability with mathematics learning outcomes of class VIII even semester of SMP Muhammadiyah 9 Yogyakarta 2016/2017 academic year obtained a double correlation coefficient (R) of 0.8202 at a significant level of 5% the regression equation is $\hat{Y}$ = -7,8262 + 0,2759X_1 + 0,2246X_2 + 0,5560X_3. In this study also obtained a coefficient of determination (R^2) of 0.6727. While X_1 relative contribution is 13.8625%, X_2 relative contribution is 8.8713%, and X3's relative contribution is 77.2662% and X_1 effective contribution is 9.33250%, X_2 effective contribution is 5.9675%, and effective contribution X_3 of 51.9749%. Based on the results of this calculation shows that the numerical ability variable (X_3) provides the most dominant relationship to learning outcomes (Y) compared to classmates interaction variables (X_1) and mathematics learning motivation (X_2).

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