THE RELATIONSHIP BETWEEN NUMERICAL ABILITY, PARENTAL CONCERN, AND LEARNING MOTIVATION WITH MATHEMATICS LEARNING OUTCOMES IN STUDENTS CLASS VII OF SMP

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ABSTRACT

This research is motivated by students' numerical abilities, which are getting low, parental concern, and learning motivation. The purpose of this research was to know that there is a positive connection that significant or not numerical ability, parental concern, and the learning motivation to mathematics learning outcomes in students class VII of SMP Muhammadiyah 9 Yogyakarta Second Semester Year of Academic 2016/2017. This research is classified as quantitative research with the population entire in students class VII of SMP Muhammadiyah 9 Yogyakarta Second Semester Year of Academic 2016/2017 consisting of 5 classes as many as 161 students. The sample was taken by a random sampling technique to the class and obtained class VII A of 32 students sample. Data collection techniques used tests and questionnaires. Data analysis used multiple linear regression and correlation analysis. The results showed there is a positive and significant relationship among numerical ability, parental concern, and learning motivation the results of learning mathematics with $F_{count} = 10,210$ dan $F_{table} = 2,95$ so that obtained $F_{count} > F_{table}$ with $R^2 = 0,522432068$ and $\hat{Y} = -91,97803087 + 0,24612655X_1 + 0,647302764X_2 + 0,85573043X_3$ as well as Relative Contribution$(RC)\%_{X_1} =17,274\%$, RC $\%_{X_2} =42,307\%$, RC $\%_{X_3} =40,419\%$, Effective Contribution(EC) $\%_{X_1} =9,025\%$,EC $\%_{X_2} =22,102\%$, EC $\%_{X_3} =21,116\%$.

Keywords: Numerical Ability, Parental Concern, and Learning Motivation.

INTRODUCTION

Humans need education in their lives. In the presence of a nation, the school has a vital role in ensuring the development and survival of the country concerned (Wahyudin Dinn, Supriadi, and Abduhak Ishak, 2007: 32). Education is an effort so that humans can develop their potential through a learning process that is known and recognized by the community (National Education System Law Number 20 of 2003). Thus every human being needs the education to ensure the development and survival of a nation by developing their potential through the learning process.

Education is an education service group that organizes knowledge on precise lines, namely primary education, secondary education, and higher education; non-formal channels, namely education outside formal education; and informal, namely education obtained through family and environment (Law on National Education System Number 20 of 2003). Arikunto S and Yuliana L (2012: 15) state that educational institutions are bodies or institutions, both public and private that carry out educational activities. While Wahyudin Dinn, Supriadi, and Abduhak Ishak, (2007: 39) stated that education guides students towards maturity, through school education programs or non-school education. Therefore, educational institutions are formal, non-formal, and informal institutions that conduct and educate people towards maturity.

Suherman E, et al. (2003: 25) state that mathematics is the queen or mother of knowledge, meaning that mathematics is the source of other sciences. Many sciences whose discovery and development depend on mathematics. Kline in Tombokan, J and Kandou, S (2014: 28) states that mathematics is the knowledge that does not stand alone, but can help humans to understand and solve

social, economic, and natural problems. Therefore, mathematics is essential to be studied in educational institutions because of the queen of knowledge and helps humans understand and solve problems.

Learning success is influenced by many factors, but can be classified into two groups, namely internal factors and external factors (Slameto, 2010: 54). Internal factors are factors found in students, including intelligence, attention, interests, talents, motivation, and others. In contrast, external factors are factors outside the student's self, including environment, facilities and infrastructure, weather, and others (Syah M, 2013). Therefore, the success or failure of student learning is influenced by factors from students and outside students.

Numerical ability is an essential mathematical ability also, subtraction, multiplication, and division (Uno B, 2007A: 136). Whereas Barrett, J, and Williams, G (1996: 67) state that numerical ability is the ability to think with numbers (numbers), rather than manipulate it. Therefore, mathematical knowledge is beneficial for learning mathematics because almost all material learned in mathematics uses numbers and requires a lot of completion of calculations.

Syah, M (2013:135) reveals that external factors in the form of a social environment are more affecting the learning activities are parents. Parents are the first and foremost environment for the education and development of children who have an essential role in education (Slameto, 2010:61). Chira in Santrock, J (2012:106) stated that in a survey, the teachers mentioned the involvement of people tau as the number one priority to improve the quality of education. While Myers-Walls and Frias in Santrock J (2012:107) stated that lack of parental involvement led educators to worry about the lack of students ' achievements so that parents who are not or lacking are involved in His children's education is likely to below. Therefore, as the number one priority, parents have an essential role in improving student learning outcomes.

Syah, M (2013:134) states that one of the internal factors affecting student learning's success is Shiva's motivation. Kompri (2015:4) States that motivation is an encouragement from within an individual to act with a planned purpose. Uno, B (2007B: 23) states that motivation is an internal and external urge for students to conduct behavioral changes. While Hamalik, (2005:161) said that without motivation to learn, there would be no such thing as learning. Therefore, the motivation to learn is essential because as a driver to take action with planned objectives, conduct behavioral changes, and will arise something of learning that can affect the success of Learn.

Here is the data that can give a detailed description of student Mathematics study results shown in the value Middle exam semester II students grade VII in SMP Muhammadiyah 9 Yogyakarta school year 2016/2017.

Table 1. Middle exam rate of Semester Mathematics class VII Semester II SMP Muhammadiyah 9 Yogyakarta school year 2016/2017

Class	Score			
	Average value	Complete	Incomplete	Total students
A	49,125	2	30	32
B	56,875	8	24	32
C	49,250	2	30	32
D	49,656	6	26	32
E	42,788	5	28	33
Total	-	23	138	161
Percentage	-	14,286	85,714	100

Data Source: Muhammadiyah 9 Yogyakarta Middle School, FY 2016/2017

From the above data, it can be concluded that students' mathematics learning outcomes are still below the Minimum Mastery Criteria (KKM) in mathematics class VII in SMP Muhammadiyah 9 Yogyakarta is 70. The percentage of students whose grades are below CCM= 85.714%. This shows that the mathematics learning outcomes of Grade VII students are still low.

The results of the midterm II academic year 2016/2017 and interviews conducted from teachers and some students at SMP Muhammadiyah 9 Yogyakarta on November 17, 2017, and December 9,

2017. Based on student interviews, students consider mathematics to be a difficult subject and boring, even scary. Students have difficulty solving math problems and still feel confused in understanding the meaning of the issues so they do not follow the steps that must be taken to solve mathematical problems. Also, students sometimes ask the teacher about solving math problems when learning. When students work on math problems, they are confused by the operation results, such as questions -25 - (-5). Students are sometimes confused about working on the issue, and some students answer -30, others answer -20. So from the results of student interviews, it can be concluded that students' numerical ability is still lacking.

In addition to numerical ability, there is a factor that allegedly affects student mathematics learning results of parents ' attention. Parents ' attention is still lacking. This can be seen from several students ' interviews that the provision of student learning facilities has not all met, such as a ruler, Bow, and term. Also, not yet fully parents pay attention to students in learning their children, such as asking for school assignments, accompanying them in learning, organizing learning time, providing motivation and appreciation, and assisting in learning difficulties by Guiding learning directly or providing tutoring to their children in the form of training.

In addition to the numerical ability and attention of parents, there is a factor that allegedly affects student mathematics learning results, i.e., learning motivation. Based on teacher interviews, some students' motivation is still less and less active in learning, such as working on questions and asking teachers about math lessons. Whereas based on the results of interviews, several students studying the environment in class are not conducive and lazy students in solving math problems. So from the effects of interviews, teachers and students can be concluded that the motivation to learn students less.

RESEARCH METHOD

This research is classified as quantitative research. Based on the research variables, the model linkage between the free and bound variables is compiled as follows.
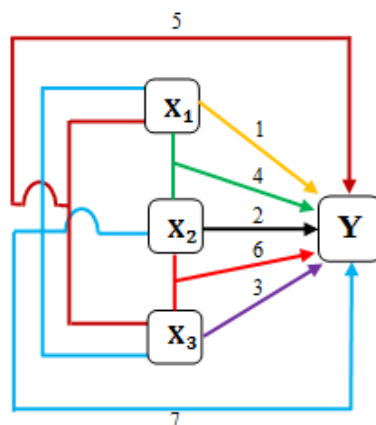
Figure 1. Schema relations between variables in research

(Sugiyono:2015)

Model interconnectedness between free variables with bound variables

Description:

X_1 = Numerical ability

X_2 = Parents attention

X_3 = Learning Motivation

Y = Mathematics Learning Results

This study was conducted in SMP Muhammadiyah 9 Yogyakarta in the even semester of the 2016/2017 school year. The population in this study was a total of 161 students in grade VII. The sampling in this study used random sampling techniques for the class, taken randomly by class draw and captured as class VII A as many as 32 students.

The variables used in this study consist of three free variables, i.e., numerical ability (X_1), parental attention (X_2), and learning motivation (X_3), and one bound variable that is the result of learning Mathematics (Y). The data collection techniques in this study used to poll and test procedures—data collection instrument in the form of a test of numerical ability and learning results of mathematics. The device of data collection in the form of a poll is the attention of parents and learning motivation. Before testing on sample classes, survey and test instruments must first be checked for validity, different power, and reliability unless a poll instrument is not verified for control. At the validity of the poll, there are tests of non-test devices that have been tested by expert lecturers and reliability tests using the formula coefficient of Cronbach Alpha. The validity test of experiments using a double-choice item study test has been verified by expert lecturers and validity tests using the correlation formula of product-moment, then tested different power and tested for reliability using the Kuder-Richardson formula (K-R-20).

In the data analysis technique, the poll and test data were first converted by calculation of scale reference, then carried out the prerequisite analysis test, namely the normality test, Linieritas test, and the independence test. Afterward, it is followed by test the correlation coefficient and simple linear regression to test the first, second, and third hypothesis with the T-test analysis, namely:

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

Description:

    r = Correlation coefficient

    n = Total samples

(Sudjana: 2002)

With the criteria of the correlation decision means (significant) if $t_{count} > t_{table}$. This at the level of the status of 5% and the degree of freedom $dk = n-2$, then the H_0 rejected, and H_1 accepted. While test the correlation coefficient and double linear regression to test the fourth, fifth, sixth, and seventh hypothesis with the F test, namely:

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

(Khasanah U: 2014)

Description:

    F: F Price regression line

    R^2: Coefficient of determination double

    n: Number of samples

    p: the number of independent variables

With the correlation decision criteria meaningful (significant) if $F_{count} > F_{table}$ at a significant level of 5%, the degree of freedom of numerator ($v_1 = p$), and the degree of denominator freedom ($v_1 = n - p - 1$) then H0 is rejected, and H1 is accepted.

After being fulfilled, a calculation of the relative contribution is made for the fourth, fifth, sixth, and seventh hypotheses to show the magnitude of the contribution of each independent variable for prediction seen in JKR.

$$RC\%_{X_1} = \frac{b_1 \sum_{=1}^{n} x_1 y}{JKR} \times 100\%$$

$$RC\%_{X_2} = \frac{b_2 \sum_{=1}^{n} x_2 y}{JKR} \times 100\%$$

$$RC\%_{X_3} = \frac{b_3 \sum_{=1}^{n} x_3 y}{JKR} \times 100\%$$

For:

    $RC\%_{X_1}$: Relative contribution of X_1

    $RC\%_{X_2}$: Relative contribution of X_2

    $RC\%_{X_3}$: Relative contribution of X_3

(Khasanah U:2014)

While the useful contribution for the fourth, fifth, sixth, and seventh hypotheses is to determine the magnitude of the contribution of each independent variable to the effectiveness of the regression line for the overall prediction.

$$EC_{X_1} = RC\%_{X_1} \times R^2$$
$$EC_{X_2} = RC_{X_2} \times R^2$$
$$EC_{X_3} = RC\%_{X_3} \times R^2$$

(Khasanah U: 2014)

Description:

EC_{X_1}: Effective contribution of X_1

EC_{X_2}: Effective participation of X_2

EC_{X_3}: Effective contribution of X_3

RESULTS AND DISCUCCION

Before the questionnaire was given to the sample class, the quiz as many as 25 items were tested beforehand in class VII E as many as 33 students to find out its reliability, for the questionnaire attention to reliable parents with sufficient criteria at a significant level of 5% was obtained r_{table} 0.344 amounting to and r_{count} of 0.742. In contrast, for the reliable learning motivation questionnaire, the requirements are sufficient at a significant level of 5% obtained r_{table} of 0.344 and r_{count} of 0.622. Before the test was given to the sample, the numerical ability test instrument and mathematics learning outcomes with each of the 25 items were trialed in class VII E as many as 33 students to find out their validity, different power, and reliability. Test the validity of numerical ability tests at a significant level of 5% with a r_{table} of 0.33 obtained the number of items that fall as many as eight questions and things that are valid as many as 17 questions, while for tests of mathematics learning outcomes at a significant level of 5% with r_{table} of 0.33 obtained the number of items that fall as many as seven questions and as many as 18 topics valid questions. Different power tests of numerical ability tests and learning outcomes were obtained with excellent and sufficient criteria for mathematics learning achievement tests that had as many right standards as 1 question and adequate measures as many as 17 items. After testing the validity and different power, reliability is proved. For the reliable numerical ability test with a high criterion at a significant level of 5%, r_{table} is obtained at 0.344 and r_{count} by 0.955. In comparison, for the mathematics learning achievement test, the reliability criteria are sufficient at a substantial degree of 5% obtained r_{table} of 0.344 and r_{count} by 0.657.

After the questionnaire and test are tested, the quiz and examination are given to the sample class to determine the data in the form of values, before the data is converted first by calculating the scale reference. Then the prerequisite tests are analyzed for normality test, linearity test, and independence test. The normality test in this study uses the *chi-square formula* (χ^2). The decision-making criteria are the distribution of data obtained on each variable normally distributed if $\chi^2_{count} \leq \chi^2_{table}$ with a significant level of 5% and degrees of freedom, namely $dk = k - 1$. The normality test results for the four variables are typical and can be seen in Table 2.

Table 2. Summary of Normality Test Results

No	Variable	χ^2_{count}	χ^2_{table}	df
1	Numerical Ability	1,761	5,99915	2
2	Parents attention	2,535	7,8147	3
3	Motivation Learning	1,492	7,8147	3
4	Mathematics Learning Results	5,456	9,48147	4

Linearity test in this study uses a linear regression formula (F-Test), the decision making criteria is the relationship between the variable X and Y direct if $F_{count} \leq F_{table}$ with a 5% significance level and degrees of freedom namely df numerator $(v_1) = k - 2$ and dk denominator $(v_2) = n - k$. The

results of the free variable linearity test with the dependent variable are linear and can be seen in Table 3.

Table 3. Summary of Linearity Test Results

No	Variable	F_{count}	F_{table}	v_1	v_2
1	X_1 with Y	1,761	5,99915	6	24
2	X_2 $with$ Y	2,535	7,8147	21	9
3	X_3 with Y	1,492	7,8147	18	12

Independent test in this study using Chi-squared formula (χ^2), the decision-making criterion is that both of the free variables are independent if $\chi^2_{count} \leq \chi^2_{table}$ with a significant level of 5% degree of freedom is $dk = (B-1)(K-1)$. Independent test results between free variables are independent and can be seen in table 4.

Table 4. Summary of independent test results

No	Variable	χ^2_{count}	χ^2_{table}	df
1	X_1 with X_2	34,444	37,6525	25
2	X_1 with X_3	27,389	37,6525	25
3	X_2 with X_3	28,778	37,6525	25

Afterward, test the correlation coefficient and simple linear regression, correlation and double linear regression, relative donations, and effective donations. With the analysis of the double linear correlation and test-F, it was obtained a second correlation coefficient (R) between the numerical ability (X_1), the attention of the elderly (X_2) and the motivation to learn (X_3) with the results of Learning Mathematics (Y) amounting to 0.722794624 while the coefficient Determination (R^2) 0.522432068 means that the 52.2432068% of learning outcomes are influenced by numerical ability, parental attention, and motivational learning. In contrast, the remaining 47.7567932% of the learning outcomes are influenced by other factors not examined in This research. This study acquired F_{count}= 10.210, whereas F_{table} at a significant level of 5% and df numerator $v_1 = 3$ and df denominator $v_2 = 28$ by 2.95. Thus obtained $F_{count} \leq F_{table}$, as such, has been tested with H_0 rejected, and H_1 accepted. There is a positive and significant relationship between numerical ability, parental attention, and motivation to learn with the results of learning mathematics. It can be seen from the dual linear regression equations of the three predictors, i.e., $\hat{Y} = -91,9780308 + 0,246126556X_1 + 0,647302764X_2 + 0,85573043X_3$, meaning each increment of one unit X_1 increased 0.246126556 Y, each unit increments X_2 resulted in 0.647302764 Y increase and each increase in one unit X_3 resulted in 0.85573043 increase of Y. Its relative donation of X_1 17.274%, X_2 of 42.307% and X_3 of 40.419%, and the effective donation X_1 of 9.025%, X_2 of 22.102% and X_3 of 21.116%. From the results of this calculation, the higher the numerical ability, the attention of parents, and the motivation to learn that the learning results will also be better, and vice versa.

CONCLUSION

Based on research that has been carried out at Yogyakarta Muhammadiyah 9 Middle School 2016/2017 Academic Year, it can be concluded that "There is a positive and significant relationship between numerical ability, parent's attention and motivation to learn with mathematics learning outcomes of VII grade students of SMP Muhammmadiyah 9 Yogyakarta even semester. 2016/2017 teaching ". With multiple linear correlation analysis and F-test, the multiple correlation coefficient (R) is obtained at 0.722794624. The ratio of determination (R^2) 0.522432068 means that 52.2242068% of learning outcomes are influenced by numerical ability, parents' attention, and learning motivation. In contrast, the remaining 47,7567932% learning outcomes are influenced by other factors not examined in this study. In this study, the F_{count} of 10.210 was obtained while the F_{table} at a significant level of 5% and the numerator dk $v_1 = 3$ and the denominator $v_2 = 28$ was 2.95, so the $F_{count} > F_{table}$ with a

double linear regression equation of three predictors is $\hat{Y} = -91{,}9780308 + 0{,}246126556X_1 + 0{,}647302764X_2 + 0{,}85573043X_3$, means that every increase of one unit X_1 results in 0.246126556 an increase in Y, every increase in one unit X_2 results in a rise in Y 647302764 Y and every increase in one group X_3 results in an increase in 0.85573043 Y Whereas the relative contribution of X_1 is 17,274%, X_2 is 42,307%, and X_3 is 40,419%, and the effective contribution X_1 is 9,025%, X_2 is 22,102% and X_3 is 21,116%.

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