

THE RELATIONSHIP BETWEEN NUMERICAL ABILITY, VERBAL ABILITY, AND PEER IN SCHOOL WITH MATHEMATICS LEARNING OUTCOMES IN STUDENTS CLASS VIII OF SMP MUHAMMADIYAH 4 YOGYAKARTA

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ABSTRACT

Based on the observation that has done in SMP Muhammadiyah 4 Yogyakarta that some students are less conscientious in performing basic arithmetic operations. Numeric ability, verbal ability and peer are some of the factors that relate to student learning outcomes. This research aims to know about is there any positive correlation and significance or not between manner learning, mathematics communication, and learning tools with mathematics learning outcomes in students class VIII of SMP Muhammadiyah 4 Yogyakarta in even semester in the academic year of 2016/2017. The population in this research was the students of VIII grade in SMP Muhammadiyah 4 Yogyakarta in the academic year of 2016/2017, consisted of class VIIA, VIIIB, VIIC, VIID totaling 104 students. Samples were taken from VIIIB as the research sample class and with the random sampling technique. The writer uses the test method to collect the data of numeric ability, verbal ability and the resulting learning of math and questionnaire method to get peer interaction. The writer uses product-moment correlation analysis and multiple linear regression analysis to analyze the data. The results showed that there was a positive and significant relationship between manner learning, mathematics communication, and learning tools with mathematics learning outcomes in students class VIII in even Semester of SMP Muhammadiyah 4 Yogyakarta in the academic year of 2016/2017. It is showed by $F_{stat} > F_{table}$ is $10,491 > 3,05$ with $R = 0,767$ and $R^2 = 0,5886$ with $\hat{Y} = -1,4541 + 0,449 X_1 + 0,1745 X_2 + 0,3365 X_3$, with $SR X_1 = 47,160 \%$, $SR X_2 = 20,188\%$ and $SR X_3 = 32,651 \%$, $SE X_1 = 27,757 \%$, $SE X_2 = 11,882 \%$ and $SE X_3 = 19,217 \%$.

Keywords: Numeric ability, verbal ability, peer, mathematics learning outcomes

INTRODUCTION

Good quality education can be seen from the learning process that occurs as well as student mathematics learning outcomes. Educational goals are said to be achieved if student learning outcomes experience development and improvement. As for what is meant by learning outcomes are the results of learning efforts implemented by students. Informal education is always followed by measurement and assessment, as well as learning outcomes can be seen in the position of students who are fast, moderate or slow in receiving subject matter. Receive subject matter.

In the learning process, elements of the learning process play an important role. The core of educational activities is teaching and learning activities. The success of students in participating in educational programs in schools is seen based on the results of their learning. Learning outcomes are the maximum benchmarks achieved by students after doing the learning process. High and low student mathematics learning outcomes can be influenced by various factors, both factors that originate from within students (internal factors) or from outside themselves students (external factors). Internal factors are factors that exist in individuals who are doing the learning, including numerical abilities and verbal abilities. External factors are external factors that include peers.

From interviews with a number of eighth-grade students of Muhammadiyah 4 Yogyakarta Middle School, students still find it difficult to learn mathematics. Some students learn less about basic operations and are not careful in their calculations. This indicates students have less numerical ability. In addition, from the results of interviews with mathematics teachers in grade VIII, SMP Muhammadiyah 4 Yogyakarta, in general, the ability of students to understand a reading or vocabulary is still low, this is evidenced by some students who are still having difficulty understanding questions and statements in learning mathematics.

Based on the results of observations in class VIII Muhammadiyah 4 Yogyakarta Junior High School, not a few students were not serious when attending mathematics, it showed that students were late in class and many were still chatting with their peers outside the class. Some of their students even claimed to hang out with peers whom they considered suitable and comfortable so that they had their own other groups. They more often spend time with peers to gather and play rather than study. Some of these things are thought to result in low student learning outcomes.

Based on the Middle Semester Deuteronomy Test (UTS) grade VIII students of SMP Muhammadiyah 4 Yogyakarta 2016/2017 school year, it is known that the number of students who are less than the Minimum Mastery Criteria (KKM) of 83 students out of 104 students has not yet reached the KKM score of 70 in subjects mathematics applied in school. This shows that student mathematics learning outcomes are still low.

Thus, based on the above problems the researcher is encouraged to reveal the relationship between the numerical abilities of verbal abilities and peers with the results of learning mathematics. This is intended to obtain information about students' numerical ability in terms of arithmetic operations, students' verbal abilities in processing vocabulary and the role of peers in relation to mathematics learning outcomes. The aim of this research is to find out whether there is a positive and significant relationship between numerical ability, verbal ability and peers with mathematics learning outcomes of Grade VIII students of SMP Muhammadiyah 4 Yogyakarta 2016/2017 Academic Year.

THEORY

According to Walgito Bimo (2004: 197), N (number facility), which is the ability related to speed and accuracy in computing (computing). Meanwhile, according to Aristo, Chandra (2014: 3) Numerical ability test is a test that is a basic test of numbers and mathematical symbols. This test requires precision and speed in the use of basic functions and basic operations in mathematics.

According to Walgito, Bimo (2004: 197), V (Verbal comprehension), which is the ability which involves vocabulary understanding, verbal analogy, and the like. Meanwhile, according to Chandra, Aristo (2014: 129): The function of the verbal ability test is to test the ability to form new ideas or ideas, and combine these ideas into something new based on information or elements that already exist, reflecting the fluency, flexibility, originality in divergent thinking that is revealed verbally. According to Santrock, John W understands peers (peers) in Desmita (2009: 224) peers (peers) are teenagers with the same age or maturity level.

METHODS

The type of research used is as follows:

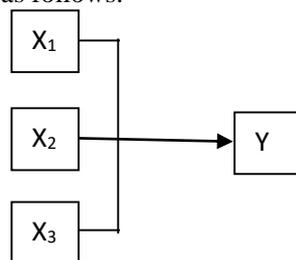


Figure I. Multiple paradigms with three independent variables.

Information:

X_1 = Numerical ability

X_2 = verbal ability

X_3 = Peers

Y = Mathematics Learning Outcomes

The study was conducted at Muhammadiyah 4 Junior High School Yogyakarta. The study was conducted in November 2016 odd semester 2016/2017 school year. The population in this study were eighth-grade

students of Muhammadiyah 4 Yogyakarta Middle School Odd Semester 2016/2017 Academic Year consisting of 4 classes, namely classes VIII A, VIII B, VIII C, VIII D with a total number of students 104 students.

In this study the sampling was done using random sampling techniques, the class is taken as a research sample was class VIII B with 26 students. The techniques used to collect data in this study are questionnaires and tests. Before being used to reveal actual data, the instrument was tested in a pilot class with the aim of knowing the validity and reliability of the instrument or in other words to identify problems that were weak or flawed. According to Arikunto, Suharsimi (2012: 85) a test is said to have validity if the results are in accordance with the criteria, in the sense of having parallels between the results of the tests with the criteria.

The analysis test used in this study is a prerequisite test in the form of a normality test, an independent test and a linearity test, and a hypothesis test. To test the hypothesis, simple linear regression and multiple linear regression tests are used.

a. Simple linear regression test

Used for the first, second and third hypotheses

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

(Sudjana, 2005: 380)

b. Multiple Linear Regression Test

Used for the fourth, fifth, sixth and seventh hypothesis testing.

$$F_{regression} = \frac{R^2(N-p-1)}{p(1-R^2)}$$

(Khasanah, Uswatun 2014: 153)

RESULTS AND DISCUSSION

Data on students' numerical ability was obtained from the instrument scores given to 26 students by 25 question items. Then obtained the highest score of 17 with a value of 85 and the lowest score of 8 with a value of 40. The average score of 62.7. Verbal ability data were obtained from instrument scores given to 26 students totaling 20 questions. Then obtained the highest value of 90 and the lowest value of 8 can be seen in Appendix 9. The average score of 71.6. Peer data was obtained from instrument scores given to 26 students totaling 25 statements. Then obtained the highest score of 119 and the lowest score of 80. The average score of 98.115. Mathematics learning outcomes data obtained from the instrument scores given to 26 students a total of 20 questions. Then obtained the highest value of 95 and the lowest value of 55. The average score of 14.35.

The things that have been explained above, can be explained through linear relationships $\hat{Y} = -1,4541 + 0,449 X_1 + 0,1745 X_2 + 0,3365 X_3$. This means an increase in one unit (X_1) results in 0.449 increase in Y, increase in one unit (X_2) results in 0.1745 increase in Y, and an increase in one unit (X_3) results in 0.3365 increase in Y, in other words, if the relationship between numerical ability, verbal ability and the better the peer, the student learning outcomes in mathematics will increase. Student mathematics learning outcomes are influenced by numerical abilities, verbal abilities and peers by 58.86% while 41.14% are influenced by other factors not discussed in this study. Of the three variables in this study, the greatest effective contribution was the verbal ability variable (X_2).

After it is known that numerical ability, verbal ability, and peers have a positive and significant effect on mathematics learning outcomes, this means that the increase and decrease in student mathematics learning outcomes are related to numerical abilities, verbal abilities and peers. Therefore it is expected that various parties can optimize their role in improving student mathematics learning outcomes.

CONCLUSION

Based on the results of the research and discussion above, the following research conclusions can be drawn that there is a positive and significant relationship between numerical ability, verbal ability and peers with mathematics learning outcomes of students of class VIII at Muhammadiyah 4 Yogyakarta Middle School odd semester 2016/2017 school year. This is indicated by the F test is $F_{count} > F_{table}$ or $10,491 > 3,05$. The correlation coefficient (R) between numerical ability, verbal ability and peers with mathematics learning outcomes of 0.767 and the coefficient of determination (R^2) of 0.5886 with linear line equations $\hat{Y} = -1,4541 + 0,449 X_1 + 0,1745 X_2 + 0,3365 X_3$. The relative contribution of X_1 was 47,160%, X_2 was 20,188% and X_3 was 32,651% and the effective contribution was 27,757%, X_2 was 11,882% and X_3 was 19,217%.

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