THE RELATIONSHIP BETWEEN NUMERICAL ABILITY AND PEERS WITH STUDENT'S MATHEMATICS LEARNING OUTCOMES

Iqdam[a], Widayati[b]
Program Studi Pendidikan Matematika Universitas Ahmad Dahlan
Jalan Ring Road Selatan, Tamanan, Banguntapan, Bantul Yogyakarta
[b]iqdam1992@gmail.com, [b]ummunabilah67@gmail.com

ABSTRACT

This research is motivated by students' low numerical ability as a personal factor of students. Numerical ability and peers are suspected to be associated with poor student learning outcomes. This study aims to determine the presence or absence of a significant positive correlation between numerical skills and peers with learning outcomes in the eighth-grade student of Junior High School (SMP) Muhammadiyah Bligo Pekalongan in the academic year of 2017/2018. This study was classified as a quantitative study. This study's population was all eighth-grade students of SMP Muhammadiyah Bligo Pekalongan in 2017/2018, consisting of two classes with 42 students. Samples were taken by random sampling technique to the class and obtained the class VIIIA as a sample class with 21 students. Collection data techniques used questionnaires and test techniques. The testing instrument used validity and reliability. The prerequisite analysis test used the normality test, linearity, and independent test. Data analysis test for hypothesis testing using regression analysis and correlation analysis. The results showed that there is a positive and significant relationship between numerical ability and peers with math learning outcomes with $F_{count} = 12.50668 > F_{table} = 3,59$, with a correlation coefficient (R) of 0.7716, and $\hat{Y} = 6.84589 + 0.52719\ X_1 + 0.23563\ X_2$ and Relative contribution X_1 of 86.34459%, relative contribution X_2 of 13.65541% and effective contribution X_1 of 51.40671% and effective contribution X_2 of 8.12997%.
Keyword: Numerical Ability, Peers, Learning Outcomes.

INTRODUCTION

The development of a country will not be separated from the role of humans in it. To create a developing country, people with integrity are needed. Humans cannot easily integrate with integrity. Humans with integrity are formed through many factors. A critical factor in the formation of people with integrity is through education. Education in Indonesia is realized in 9-year compulsory education. That was done to form humans in facing the era of information and communication openness to competing in the world. In the big Indonesian dictionary (1991), education is defined as changing a person's attitudes and behavior to mature humans through teaching and training efforts. Teaching and training efforts come from many aspects of life, including at school. At school, many things are taught. Starting from the social sciences, exact sciences, and religious sciences. Among these sciences, mathematics is also in it. Mathematics is one of the important sciences. Human life is inseparable from the application of mathematics.

In Suherman, Erman (2013: 16), James and James stated that mathematical science about logic regarding the form, composition, magnitude, and concepts related to one another with a large number divided into three fields, namely algebra, analysis, and geometry. Also, Johnson and Rising said that mathematics is a pattern of thinking, organizing, logical proof. Mathematics is a language that uses terms that are defined carefully, clearly, accurately.

Among these sciences, mathematics is also in it. Mathematics is one of the important sciences. Human life is inseparable from the application of mathematics. In the standard competency learning tools and basic competency KTSP mathematics subjects aim that students have the ability to, among others (1) understand mathematical concepts, explain the inter-conceptual relationships and apply concepts or algorithms flexibly, accurately, efficiently, and precisely in problem-solving, (2) using reasoning on patterns and properties, doing mathematical manipulation in making generalizations, compiling evidence, or explaining mathematical ideas and statements, (3) solving problems that include

the ability to understand problems, design mathematics, solve and interpret the solutions obtained, (4) communicating ideas with symbols, tables, diagrams, or other media to clarify the situation or problem (5) having an attitude of appreciating the usefulness of mathematics in life, namely having curiosity, attention, and interest in learning mathematics, as well as being tenacious and confident in solving the problem.

Medium school mathematics is mathematics taught in schools. Namely, mathematics taught in primary education (elementary and junior high) and secondary education (high school and vocational) is useful in developing abilities and forming personal and guided in developing science and technology. Suherman, E (2003: 55-56). Mathematics is one of the subjects that becomes the top priority in school and is used as one of the subjects tested in the national final exam (UAN) that affects student graduation. However, it becomes difficult because students consider mathematics as a complicated subject. Students are not interested in taking math lessons. It also affects the learning outcomes of mathematics that are still low.

Learning outcomes are behavioral changes that cover the cognitive, affective, and psychomotor fields. Student learning outcomes as a result of student behavior in the learning process. (Sudjana, Nana, 1990: 3) then, According to Slameto (2015: 54), there are 2 (two) things that affect learning outcomes, namely (1) internal factors: physical factors, psychological factors, and (2) external (external) factors: family, school environment, and community environment. The better internal and external factors, the better the learning outcomes obtained by students.

Table 1. The average scores of the end of semester exam scores for classes VIIA and VIIB

Class	Average	Max	Min	< MCC	> MCC
VII A	60.1	80	47.5	17	4
VII B	57.5	77.5	45	18	2
Total students				35	6
Percentage				85.36%	14.64%

Based on the Table 1, it can be seen that the average results of the final semester, even semester VII grade students of the 2016/2017 school year, are still low. Most students still have not passed the minimum completeness criteria (MCC).

Learning is a business process carried out by a person to obtain a new change in behavior as a whole, as a result of his own experience in interactions with his environment. Slameto (2015: 2). Learning is then a series of physical and mental activities to obtain a change in behavior due to individuals' experience in interactions with their environment that involves cognitive, affective, and psychomotor. Djamarah, Syaiful Bahri (2011: 13)

From the interview results with Ms. Laila Maghfiroh, S.Pd. as a mathematics teacher at SMP Muhammadiyah Bligo, information was obtained that many students did not understand the application of the basic calculation system. It can be said that the numerical ability of some eighth-grade students at SMP Muhammadiyah Bligo is still low. Numerical ability is the ability to understand the number system and solve problems related to number concepts. (Fudyartanta: 2010)

According to Slameto (2010: 14), namely: Numerical ability includes the standard ability of numbers, the ability to count, which contains reasoning and algebraic skills, the ability to operate numbers includes arithmetic operations addition, subtraction, multiplication, and division. Numerical ability is closely related to the ability to count, accuracy, and accuracy in the use of basic calculation functions. Meanwhile, according to Carter, P (2011: 48): Numerical ability tests are designed to assess how well a person can reason numbers, including arithmetic, the sequence of numbers, and logical reasoning. Numerical ability tests are used to test mathematical calculations, number pattern recognition, and numerical reasoning skills.

Problems were also found that allegedly influenced the low level of student learning outcomes in class VIII in an odd semester at SMP Muhammadiyah Bligo, namely student peers. Peer groups (peers) are groups of individuals who have similarities in various aspects, especially their age and social

status. Within the school's scope, peers can be classmates, click in the class, and the game group. ST. Vembriarto (1984: 60).

Meanwhile, David Popenoe (in Ahmadi, A, 2004: 192) said that During adolescence, peers are the primary agents in socializing and their opinions (peers) often become more critical to individual teens than family, school, or society in general. This is reinforced by the Family Library Team (2006: 44), which states that peers' role is getting more prominent with age. Peers are needed to develop their potential, practice their abilities, develop empathy, sense solidarity, friendship with peers, and practice solving problems experienced at school and outside school. This is evidenced by observations when the teacher teaches in class. There are still some students who chat with peers when the teacher teaches. The teacher has to advise students several times so that students focus on learning. Peers as one of the important factors that play a role as an external factor in learning. In the age group, adolescents have a vulnerability in relationships. Association in adolescence itself is more inclined to the act to get the attention of others.

Based on the description above, the purpose of this study is to find out: (1) Whether or not there is a positive and significant relationship between numerical ability and learning outcomes of Grade VIII odd semester students at SMP Muhammadiyah Bligo, Buaran Subdistrict, Pekalongan District, 2017/2018 academic year (2) There or whether there is a positive and significant relationship between peers with class VIII student learning outcomes Odd Semester SMP Muhammadiyah Bligo, Buaran Subdistrict, Pekalongan District, the academic year 2017/2018 (3) Whether or not there is a positive and significant relationship between numerical ability and peers with student learning outcomes class VIII Odd Semester of SMP Muhammadiyah Bligo, Buaran Subdistrict, Pekalongan Regency, the academic year 2017/2018.

METHODS

This research is a quantitative study, which can be interpreted as a research method based on the philosophy of positivism, used to examine specific populations or samples, with sampling techniques that generally use random techniques, with data collection using research instruments, statistical data analysis with the goal is to test a predetermined hypothesis. (Sugiyono, 2013: 14). The population is the area of generalization consisting of objects/subjects with specific qualities and characteristics determined by researchers to be studied and then drawn conclusions. (Sugiyono, 2013: 61) This study included all eighth-grade students of SMP Muhammadiyah Bligo in Pekalongan Regency, Odd Semester, Academic Year 2017/2018. The number of students consists of 2 classes, with a total of 42 students. The research sample was taken by random sampling technique for the class and obtained class VIIIA as a sample of 21 students and VIIIB as a trial class of 21 students.

Furthermore, the research variable is an attribute or nature or value of people, objects, or activities with individual variations determined by researchers to be studied and drawn conclusions. (Sugiyono, 2013: 3). There are 2 (two) independent variables in this study: numerical ability and peers, with one dependent variable, namely mathematics learning outcomes.

The data collection technique used is a questionnaire technique. A data collection technique is done by giving a set of questions or written statements to the respondent to answer. (Sugiyono, 2016: 142) for peers and test techniques that is a tool or procedure used to measure or know something in the atmosphere with ways and rules that have been determined (Arikunto, Suharsimi, 2012: 67) for numerical abilities and learning outcomes student mathematics. The instrument test uses a validity test, according to Scarvia B. Anderson and colleagues in Suharsimi Arikunto (2012: 80) stated that: A test is valid if it measures what it aims to measure or interprets that a test is said to be valid if the test measures what you want to measure.

Moreover, a test can have a high confidence level if the test can provide fixed test results. Understanding test reliability related to determining test results or the changes that occur can be meaningless if the results change. (Arikunto, Suharsimi, 2012: 100).

The prerequisite test analysis uses the normality test, which is intended to find out the symptoms studied have a normal distribution or not. The formula used is the chi-square formula.
The linearity test aims to determine whether there is a linear relationship between the independent and dependent variables. The independence test used to know between the independent variables is independent or dependent. Data analysis for hypothesis testing uses linear regression analysis and correlation analysis.

RESULTS AND DISCUSSION

1. With simple correlation analysis and t-test, so we get a simple correlation coefficient of numerical ability (X_1) with mathematics learning outcomes (Y) of 0.75759, or it can be said that there is a positive and significant relationship with the regression direction coefficient of 0.588594476, meaning that each increase in one unit X_1 results in 0.588594476 increase in Y. From the results of this calculation, it can be seen that the higher the numerical ability, the mathematical learning outcomes obtained will be better and vice versa. From the acquisition of the highest score of 83 and the lowest score was 22 with a standard deviation of 19.0442 and a mean of 48.45 and obtained $t_{count} = 4.92423 > t_{table} = 1.7341$. So, there is a positive and significant relationship between numerical ability and mathematics learning outcomes.

2. With a simple correlation analysis and t-test, a simple correlation coefficient obtained by peers (X_2) with mathematics learning outcomes (Y) of 0.48876 or can be said to have a positive and significant relationship with the regression direction coefficient of 0.6556 means that each increase in one unit X_2 results in 0. 6556 increase in Y. From the results of this calculation, it can be seen that the better the peers, the better the results of learning mathematics will get, and vice versa. From the acquisition of the highest score of 106 and the lowest score was 66 with a standard deviation of 11.4178 and an average of 87.45 and obtained $t_{count} = 2.37688 > t_{table} = 1.7341$. So, there is a positive and significant relationship between peers and mathematics learning outcomes.

3. With multiple correlation analysis and F-test, the coefficient of multiple correlations between numerical ability (X_1) and peers (X_2) with mathematics learning outcomes (Y) is 0.7716, or it can be said that there is a significant relationship and obtained Fcount of 12.50668 while Ftable at the 5% significance level and the numerator dk (v_1) $= 2$ and the denominator dk (v_2) $= 17$ is 3.59. So, there is a positive and significant relationship between numerical ability and peers with mathematics learning outcomes. As for the relative contribution (RC), X_1 of 86.344595% and X_2 of 13.655405%. Meanwhile, effective contribution (EC) X_1 was 51.40671%, and (EC) X_2 was 8.12997%.

CONCLUSION

1. There is a positive and significant relationship between numerical ability and mathematics learning outcomes of 8th-grade students in the odd semester of SMP Muhammadiyah Bligo, the academic year 2017/2018. This can be shown by $t_{count} = 4.92423 > t_{table} = 1.7341$ with a correlation coefficient (r) of 0.75759. Meanwhile, the regression equation is obtained, namely: Y=24.82374+0.58859X₁.

2. There is a positive and significant relationship between peers and mathematics learning outcomes of 8th-grade students in the odd semester of SMP Muhammadiyah Bligo 2017/2018 school year. This can be shown by $t_{count} = 2.37688 > t_{table} = 1.7341$ with a correlation coefficient (r) of 0.48876 with the regression equation: Y= –8.1852+0.69236X₂.

3. There is a positive and significant relationship between numerical ability and peers with the mathematics learning outcomes of 8th-grade students of the odd semester of SMP Muhammadiyah Bligo in 2017/2018. This can be shown by $F_{count} = 12.50668 > F_{table} = 3.59$ with a double correlation coefficient (R) of 0.7716 and a double coefficient of determination (R^2) of 0.59537 with the multiple regression equation which is as follows Y=6.84589+0.52719X₁+23563X₂   and

obtained a relative contribution (RC) X_1 of 86.344595% and X_2 of 13.655405% and effective contributions (EC) X_1 of 51.40671% and EC X_2 of 8.12997%.

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