THE INFLUENCE OF LEARNING MEDIA, LEARNING MOTIVATION AND MATHEMATICS COMMUNICATION ON MATHEMATICS LEARNING OUTCOMES

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Abstrak: Tujuan penelitian ini untuk mengetahui hubungan pengaruh media pembelajaran, motivasi pembelajaran, dan komunikasi matematika terhadap hasil belajar siswa. Hasil belajar berperan penting dalam membentuk kualitas pendidikan seseorang. Penelitian kualitatif-korelasi dilakukan pada 215 populsi siswa secara random. Jumlah sampel ditentukan menggunakan teori Slavin. SMN N 2 Banyodono dipilih sebagai lokasi penelitian mengcu pada hasil observasi yang menunjukkan rendahnya nilai ujian akhir siswanya. Hasil penelitian menunjukkan variabel memberikan pengaruh pada hasil belajar siswa sebesar 12,7 %, sedagkan sisanya 87,3 dipengaruhi factor lain. Media pembelajaran, motivasi pembelajaran, dan komunikasi matematika memberikan data yang tidak terduga, yang memberikan kontribusi pada hasil belajar siswa serta layak untuk diteliti lebih lanjut dalam artikel ini.

Kata kunci : *Media pembelajaran, Motivasi belajar, Komunikasi matematis, Hasil belajar matematika*

Abstract: This study aim to determine the relationship between the influence of learning media, learning motivation, and mathematics communication on student learning outcomes. Learning outcomes play an important role in shaping the quality of education today. Qualitative-correlation research was conducted on 215 randomly student populations. The number of samples was determined using Slavin's theory. Junior High School 2 Banyodono was chosen as the research location referring to the results of observations which showed the low scores of the students' final exams. The results showed that the variables had an influence on student learning outcomes of 12.7%, while the remaining 87.3 were influenced by other factors. Learning media, learning motivation, and mathematical communication provide unexpected data, which contributes to student learning outcomes and deserves to be investigated further in this article.

Keywords: *Learning media, Learning motivation, Mathematical communication, Mathematic Learning Outcomes*

INTRODUCTION

Along with the rapid development of science and technology entering the era of globalization, education plays a very important role. Education creates intelligent and quality human resources. This

issue become one of the main factors in the formation of a person's personality. In essence, education trying to help students in an effort to develop knowledge and potential intelligence or useful behavior patterns. To achieve successful development in education, the goverment require to create a younger generation to be more active, creative, qualified and accomplished.

In addition, education is an absolute and mandatory that must be implemented in order to improve the quality of life of the societies. Almost all knowledge, attitudes, skills and knowledge are acquired through an educational process. Improving the quality of education has a close relationship with students as students and teachers as educators. The success of the learning process in schools can be seen from student learning outcomes. Learning outcomes as the main benchmark to determine success in a learning process.

The interaction of educators and students in studying a subject matter that has been arranged in a curriculum as the focus of learning activities. In addition to mastering teaching materials, educators certainly need to know how to convey, and how the characteristics of students. The failure of educators usually occurs not only because they lack mastery of the material, but because they do not know how to convey the subject matter properly. So that students can learn in a fun and exciting atmosphere, including in learning mathematics.

Mathematics taught in Indonesia cannot be separated from the influence of the construction of mathematics education by civilizations that seek to dominate and hegemony science in the world. Mathematics learning tends to be rigid and cold. only limited to the transmission of knowledge and students only accept mathematics for granted without any critical reflection on the knowledge received. This can be seen from the student's response to learning mathematics. Many Indonesian students experience anxiety when learning mathematics. Seeing mathematics as something scary and far from human life. Feeling meaningless, because they do not know how to use the mathematics they have learned to solve problems they face in everyday life.

The achievement of mathematics learning outcomes is the main goal in mathematics learning activities. According to Jihad and Haris (2012:14) the meaning of learning outcomes as the achievement of behavioral changes from the cognitive, affective and psychomotor domains of the learning process carried out within a certain time. According to Hamalik (2006:30) learning outcomes occur when there is a change in behavior in someone who has carried out learning activities, for example from not knowing to knowing and from not understanding to understanding. Learning outcomes can be in the form of a test of academic ability. There are several factors that influence students' mathematics learning outcomes, namely internal factors and external factors. According to Slameto (2010: 54) internal factors come from within students that affect learning outcomes including physical factors, psychological

factors and fatigue factors. Meanwhile, external factors that come from outside students that affect student learning outcomes include family factors, school factors and community factors.

One of the factors that influence learning outcomes comes from the learning media. Azhar Arsyad (2003:15) states that in a teaching and learning process there are two very important elements, namely teaching methods and learning media. Learning media as one of the factors that come from outside the students. According to the Ministry of National Education (2004:4), everything that can be used to channel messages, stimulate the thoughts, feelings, attention and willingness of students so that it can encourage the learning process is categorized as a learning medium.

Factors originating from within students include student learning motivation. According to Dimyati and Mudjiono (2009:80) motivation means a mental impulse that moves and directs human behavior, including learning behavior. Motivation has an important value in learning mathematics. Learning mathematics will be more fun if it is based on great motivation, especially from within students. According to Sadirman (2008:75) learning motivation occurs when the overall driving force in students causes learning activities, so that the desires desired by the learning subject can be achieved.

Other factors that come from within students include students' mathematical communication. Charita and Rhoda (2016) stated that mathematical communication skills are shown by expressing their ideas, describing and discussing mathematical concepts coherently and clearly. Research conducted by Astuti and Leonard (2012) shows that there is a positive and significant effect between mathematical communication skills and students' mathematics learning achievement. Therefore, student's mathematical communication has an important function to achieve the expected learning objectives.

Observational data on student learning outcomes of Junior High School 2 Banyudono on the topic of mathematics is relative low. More than 75% of students score below the Minimum Completeness Criteria (KKM) when carrying out the final exam. Therefore, research related to learning media, learning motivation, and mathematical communication in schools needs to be carried out, as an effort to see how far the role of these three variables on learning outcomes in mathematics..

RESEARCH METHOD

Quantitative-correlation research measures the relationship between variables. Take a place at Junior High School 2 Banyudono, Boyolali Distric, at once as the subject with a population of all 8th grade students consisting of 215 students. Taking samples by random sampling, where the number of samples refers to the Slavin theory. Mathematics final exam learning outcomes as the dependent variable. Meanwhile, the independent variables consist of learning media, learning motivation and mathematical communication. Data related to learning media and learning motivation were obtained

from the distribution of validated questionnaires. Mathematical communication data obtained from test scores with an instrument in the form of essay test questions. Hypothesis testing using multiple linear regression test, F-test, T-test, Coefficient of determination Analyis, and Predictor Contributions. Hypothesis prerequisite test consists of normality test, linearity test, multicollinearity test, heteroscedasticity test, and autocorrelation test.

RESULTS AND DISCUSSION

Referring to the theory put forward by Slavin, it used 140 students as samples. Summary of data from each variable in Table 1.

Table 1. Score Summaries of Data for Each Variable

Variable	Max	Min	Mean	Standard Deviation
Learning Media (X_1)	73	36	55.81	7.89
Learning Motivation (X_2)	96	24	54.27	24.49
Mathematical Communication (X_3)	72	42	59	6.99
Math Learning Test Results (Y)	84	60	64.63	10.96

Dari data yang diperoleh, selanjutnya dilakukan pengujian prasyarat dengan hasil sebagai berikut:

1. In the normality test data obtained that the residual value is normally distributed.
2. The linearity test shows that the three independent variables (X_1, X_2, X_3) have a linear relationship to the dependent variable (Y).
3. In the multicollinearity test, there is no multicollinearity between the independent variables.
4. In the heteroscedasticity test, the results showed that the data did not experience heteroscedasticity.
5. The autocorrelation test shows that the three independent variables (X_1, X_2, X_3)) have no autocorrelation with the dependent variable (Y).

After the five pre-requisite tests are completed, then hypothesis testing can be carried out. The results of the multiple linear regression test are shown in Table 2.

Table 2. Multiple Linear Regression Analysis Results

Variable	Regression Coefficient
Constanta	36.17
Learning Media (X_1)	0.10
Learning Motivation (X_2)	0.14
Mathematical Communication (X_3)	0.26

Based on Table 2 above, the multiple linear equations obtained as:

$$\hat{Y} = 36.17 + 0.10X_1 + 0.14X_2 + 0.26X_3$$

Based on the results of the analysis, it can be concluded that the presence or absence of a contribution is not based on the coefficient value, but based on the results of the F test and t test. The F test finds out the contribution of the independent variables to the dependent variable simultaneously with a significance level of 5%. F-test results in Table 3.

Table 3. F-Test Summaries

Source	JK	DK	RK	F_{obs}
Regression	2121.69	3	707.23	6.59
Error	14576.99	136	107.18	-
Total	16698.69	139	-	-

By using a significance level of 0.05, it is obtained $F_{tabel} = 2.67$. When compared with the results of F_{obs} in Table 3 above, it is known that $F_{obs} > F_{tabel}$ so that it can be concluded that there is a contribution between learning media, learning motivation and mathematics communication on mathematics learning outcomes.

Furthermore, the T-test shows the contribution of each independent variable to the dependent variable. By using a significance level of 5%, it shows that the t_{tabel} is 1,977 and the t_{obs} of each independent variable can be seen in Table 4.

Table 4. T-Test Analysis Result

Variable	t_{obs}
Learning Media (X_1)	2.451
Learning Motivation (X_2)	9.946
Mathematical Communication (X_3)	5.402

Table 4 above concludes, partially there is a contribution from each independent variable to the dependent variable. the result of t_{obs} which has a higher value than t_{tabel} as proof of data.

Furthermore, it will be seen the amount of contribution given by the independent variable to the dependent variable. The value of the correlation coefficient (R) obtained about 0.356 and the value of the coefficient of determination (R^2) show 0.127. The (R) value show less than 50% so that the independent variable has a low relationship to the dependent variable. The magnitude of the influence of the independent variable on the dependent variable is indicated by the value of R^2, which is 12.7%. These results indicate that there are 87.3% of other variables that affect mathematics learning outcomes. The relative contribution and effective contribution of each independent presented in Table 5.

Table 5. Relative Contribution and Effective Contribution

Variable	Relative Contribution	Relative Contribution
Learning Media (X_1)	3.7%	0.47%
Learning Motivation (X_2)	74.7%	9.49%
Mathematical Communication (X_3)	21.6%	2.74%

Table 5 shows that the variable of learning motivation has the greatest contribution to mathematics learning outcomes.

In accordance with the research of Firdausy et al (2019) which said that there was a contribution of student activities and learning facilities to learning outcomes indirectly through independent learning, this study found the same thing. Similar to Nurul Karimah (2016), there was a significant effect of using number line learning media on students' mathematics learning outcomes. Samura's research (2015), said that learning media can increase and direct children's attention, so that it could lead to learning motivation, more direct interaction between students and their environment, and the possibility of students to learn on their own according to their abilities and interests. Likewise, research conducted by Anis Susanti and Siti Nuriyatin (2015) concluded that there was a significant influence between students' intrinsic motivation on mathematics learning achievement of 8th class Junior High School Gedangan Sidoarjo. Research conducted by Sholeh and Sa'diah (2018) also concludes that there was an influence of learning motivation on student achievement. Astuti and Leonard (2015) showed that there was a positive and significant influence between mathematical communication skills and students' mathematics learning achievement. Furthermore, research conducted by Fadillah (2015) also showed that there was a significant influence between the learning model and students' mathematical communication skills on students' mathematics learning outcomes.

CONCLUSIONS AND SUGGESTIONS

Simultaneously, all variables such as learning media, learning motivation and mathematical communication have an influence on the mathematics learning outcomes of 8th Junior High School 2 Banyudono. Each variable having impact on mathematics learning outcomes by 12.7%, while the remaining 87.3% come from other variables which does not examined in this study. Partially, the contribution of learning media to students' mathematics learning outcomes gave a relative contribution of 3.7% and an effective contribution of 0.47%. There is a contribution of students' learning motivation to students' mathematics learning outcomes with a relative contribution of 74.7% and an effective contribution of 9.49%. Students' mathematical communication gives contribution to students'

mathematics learning outcomes with a relative contribution of 21.6% and an effective contribution of 2.74%.

This study still has many shortcomings, so that the next researcher is expected to use this research as a reference to correct deficiencies or develop other variables that can affect students' mathematics learning outcomes. Teachers should make more use of existing learning media in schools, so that students can more easily understand the material presented. With the learning media, it will increase students' learning motivation, so that students' mathematical communication skills will also be more helpful and teaching and learning activities can take place more optimally..

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