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THE EFFECTIVENESS OF ADOBE FLASH-BASED LEARNING MEDIA ON MATHEMATICS LEARNING OUTCOMES

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ABSTRACT

One of the factors for the lack of success in the mathematics learning process is that the teacher does not innovate in applying the media in learning. In general, teachers at Budi Agung Private High School still apply conventional media so students become passive and less interested in mathematics. This has an impact on the low student learning outcomes. Therefore, innovation in Adobe Flash-based learning is needed. The purpose of this study was to test the effectiveness of the use of Adobe Flash learning media on students' mathematics learning outcomes at Budi Agung Private High School, Medan. This study uses a quasi-experimental design. Data collection techniques consist of unstructured interviews, observations, documentation and tests. The data analysis techniques used are the Liliefors test to test the normality of the data, the Levene test to test the homogeneity, the independent sample test, and the party test through one sample t-test to test the hypothesis. The population in this study were classes XA and XB SMA Private Budi Agung Medan, totaling 72 students, consisting of 35 students in the experimental class and 37 students in the control class. The results of this study were obtained through the results of the students' final test (post-test). The average post-test result of the experimental class students using Adobe Flash was higher than the control class using conventional methods, with namely the experimental class was 75.1 and the control class was 55.73. And based on the results of the t-test, it was obtained that tcount > ttable, namely tcount = 5.072 and ttable = 1.

Keywords: Adobe Flash, Learning Outcomes

1. INTRODUCTION

The educational process is based on its essence is the relationship that occurs between teachers and students. Education is a process in teaching and learning activities that often occurs in schools or outside schools. According to[1]learning is a process or effort made by each individual to acquire behavior, both in the form of knowledge, skills, attitudes and positive values of an experience from various materials that have been studied.

Mathematics is one of the subjects that must exist and be studied at all levels of education in Indonesia. In fact, in everyday life from elementary school to high school level, there are still many students who think that math is an unimportant lesson to learn because it only makes their brains spin with the many formulas that are considered difficult and they must memorize especially if coupled with the class conditions are quite stressful.

According to[2]learning components include: objectives, materials, methods, and evaluation. Therefore these components are so important in the learning process, so that if there is one component that is weak, it can affect the achievement of learning objectives that are expected to be optimal. Thus the use of the right strategy will create good teaching and learning conditions, so that the learning

process can be more focused, effective, and the learning objectives are more directed so as to improve student learning outcomes in mathematics at school.

According to[3]learning outcomes is the final process of learning activities. Meanwhile according to[4]states that learning outcomes are changes in attitudes in a person that can be seen and measured in the form of knowledge, attitudes, and skills[5]. These changes can be interpreted as the occurrence of improvements and developments that were better before those who did not know became known. Therefore, the learning process will determine learning outcomes. It can be concluded that learning outcomes are the results obtained by students after he received a knowledge through his learning experience, which resulted in new behavior changes in these students. So the learning outcomes intended in this study are learning outcomes obtained from test results and can be observed in each direct learning process.

The sophistication of information and communication technology (ICT) has now gained access to present various materials visually. Multimedia-based learning is increasingly being developed in various formal and non-formal institutions in line with research[6]. This is due to the benefits of the multimedia, one of which is that it can improve student learning outcomes. Through the use of media in learning, learning will be more interesting and not monotonous. critios[7]said that learning media is a component of communication, namely as a carrier of material from the communicator to communication. Meanwhile according to[8]The media comes from the Latin word medicus which means intermediary or introduction. One of the applications in the computer in the form of multimedia that can be used as a learning medium is Adobe Flash.

2. METHOD

The type of research used in this research is quantitative research, namely research methods based on positive philosophy, used to examine certain populations or samples, data collection using research instruments, data analysis is quantitative/statistical. The research method used is experimental research method. The experimental method is a research method used to determine the effect of certain treatments on others in controlled situations[9]. The design used by researchers is a true-experimental design with posttest only control design which aims to determine the effect of using learning resources on student learning outcomes. This study uses a true experimental research design with the Posttest Only Control Design, the design of which is as follows:

Table 1 Research Design (Sugiyono, 2017)

EX	O1
KX	O2

In the implementation of this study, the experimental class was given treatment, namely learning using a computer based on Adobe Flash and the control class which was treated with conventional methods with a difference in this treatment, each class would be given a final test with the same questions. The activities carried out in collecting this data are the planning, implementation, and reporting stages.

Data on learning outcomes were obtained by examining students' answers, then analyzed to see the effect after learning using computer media in the form of Adobe Flash. Before carrying out the research hypothesis test, there are two assumptions that must be met by the research data, namely the normality test and homogeneity test. The data normality test is used to determine whether the data to be analyzed is normally distributed or not, because the parametric statistical t test can be used if the data has a normal distribution. The normality test in this study used the Liliefors test. The homogeneity test was used to determine whether the samples studied had the same variance.

Test the hypothesis on the posttest data using the t-test with the following statistical tests:

$$t = \frac{\overline{x_1} - \overline{x_2}}{s\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$ According to[10]

With the criteria for rejecting H0 if tcount ttable with dk = (n1+n2-2) with a significance level of 5% for other t values H0 is accepted (Sudjana, 2017)

3.RESULTS AND DISCUSSION

Based on the students' posttest results, the average value of the experimental class was 75.1 while the control class was 55.73. Where the highest scores and the lowest scores for the experimental class were 97 and 35, respectively, while for the control class were 74 and 13, respectively. The following are the posttest results of the experimental group and control group students:

Table 2 Posttest Results

Group	The highest score	Lowest value	Average (x)
Experiment class	97	35	75,1
control class	74	13	55.73

Next, to find out student learning outcomes after the learning process in the experimental class, the following is a summary of the results of calculations based on the percentage of categories

Table 3 Student Learning Outcomes of Experimental Class

Student scores	Category	Frequency	Percentage (%)
81-100	Very good	18	54.54
71-80	Well	2	6.06
51-70	Enough	9	27,27
30-50	Not enough	4	12,12
0-29	Very less	0	0
Amount		33	100

Table 4 Study Results of Control Class Students

Student scores	Category	Frequency	Percentage (%)
81-100	Very good	0	0
71-80	Well	2	5,4
51-70	Enough	28	75.7
30-50	Not enough	4	10.81
0-29	Very less	3	8.11
Amount		37	100

To prove the hypothesis that has been formulated and to obtain a conclusion, the results of the test data will be analyzed using the t-test. The calculation results show that the data on mathematics learning outcomes for the experimental class and the control class can be seen in the following table:

Table 5 Hypothesis Test Results

tcount	ttable	Information
5.072	1,997	tcount > ttable

It is known that dk = 33+37 – 2 = 68 with = 5% then ttable = 1.997. From the data above, it is obtained that tcount = 5.072 so that tcount > ttable i.e. 5.072 > 1.997 thus testing the hypothesis H0 is rejected and Ha is accepted, meaning that it can be concluded that there is an effect on student learning outcomes by using learning media with the help of Adobe Flash program.

4. CONCLUSION

Based on the research results obtained, it can be concluded that the average value of student learning outcomes through learning using the Adobe Flash application is better than conventional learning, this is in line with research[11][12], this becomes material for consideration for teachers to provide learning innovations to students so that learning mathematics is not monotonous just lectures, discussions, and questions and answers.

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