THE EFFECT OF MACROMEDIA FLASH BASED LEARNING MEDIA TO IMPROVE THE ABILITY TO CALCULATE OF STUDENTS IN ELEMENTARY SCHOOL

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Abstract
This study aims to determine the effect of Macromedia Flash-based learning media to improve the numeracy ability of grade 1 students. The population in this study were 30 students of Class 1 at SDN Bina Harapan as an experimental group and 30 students at Class 1 at SDN 1 Sudimampir as a control group. This research is an experimental research using Quasi Experiment design. The technique in collecting data uses the method of observation, tests, and documentation. The analysis used is a non-parametric test using the man Whitney test. The results of the Mann Whitney analysis on the pretest data obtained the Asymp value. Sig. (2-tailed) = 0.532 > significance level α = 0.05 so that the initial abilities of students to count in the experimental class and the control class is the same while the results of the Mann Whitney analysis on posttest data obtained Asymp values. Sig. (2-tailed) = 0.005 < of the significance level α = 0.05 so that the final abilities of students are different. So, Macromedia Flash 8 based learning media significant influence on elementary students' numeracy skills.

Keyword: Learning media, Mathematics, Macromedia Flash

INTRODUCTION
Until now, the development of Education and Technology is more advanced. Indonesia, as a developing country, always strives to be more developed to compete with other countries. Quoted from Nurdin, Taty, and Hasri (2018) regarding the latest data from
UNESCO on the Education Development Index (EDI) ranking, which ranks a formation towards achieving education, health, and income, that the index of human improvement in the country of Indonesia tends decreased notably in the education sector. The land of Indonesia is ranked 64th out of 127 countries in the world. The efforts made by the government so that the quality of Education in Indonesia improved by changing the KTSP curriculum into the 2013 curriculum.

The 2013 curriculum emphasizes the active role of students in the learning process. The choice of instructional media positively influences the learning process. Samsudin et al (2019) education is something that is not carried out carelessly, but there is a process and purpose. Starting from conscious effort and culminating in the process of forming attitudes developing the noble intelligence and skills of students according to their needs. According to Amiq (in Putri, et al; 2018), the media can be packaged in the form of physical objects which then convey the message. Sadiman (Ulfah, 2013) mentions that there are four types of media that are often used when learning, namely games, illustration media, audio, and silent projection. By applying learning media through the application of technology can be one of the efforts in improving the results of students' numeracy skills in mathematics. Subarinah (Sutanti, 2014) mentions that there are four arithmetic operations in mathematics, namely addition, subtraction, multiplication, and division operations. In the first class, students begin to do simple numeracy in advance in mathematics. When the teacher conveys material operations to count numbers, there are various obstacles caused by the lack of student interest in mathematics and the difficulty of students in concentrating when learning so that it can result in many students who are less capable in numeracy skills, especially in mathematics class 1.

According to Barak & Shakhman (in Suci et al. 2013), a learning that is dominated by the teacher, has been included in one of the characteristics of application in conventional education so that it cannot optimize the role of students when learning takes place. According to Amalana (in Handayani, et al. 2018), the approach taken by teachers to students using conventional methods is out of sync with the development faced by children in school. According to Kelana (2018) Learning is not a teacher-dominated process, but requires students to be active and creative in carrying out a number of activities. Thus, teachers must make innovations and innovations in learning activities, namely by choosing learning media that can make students active and easy to understand in mathematics. Through learning, media that uses multimedia applications can improve student learning...
outcomes. One form of multimedia that teachers can develop is to use the Macromedia Flash application. In line with this, Yudhiantoro (Wulandari, 2015) suggested that Macromedia Flash is a program that can be shown to students in the form of presentations for a more specific learning process. Learning media can also be used as a means for teaching and learning activities to be more productive and efficient. The research aims to determine the effect of Macromedia Flash-Based Learning Media to Improve the Counting Ability of Elementary School Students.

METHOD

The method used in this study is quantitative because this study aims to determine the effect of Macromedia Flash-based learning media to improve elementary students' numeracy skills. This research refers to the type of research that uses experimental methods. According to Roestiyah (in Yulianto et al., 2013), the innovative way is one of the teacher's attempts to teach students to do an experiment about something and observe the process of the research and then write down their work in front of the class that will evaluate together.

The design used is to use Quasi-Experimental Design in the form of Nonuquivalent Control Group Design. The research design, according to (Kelana, 2019), is in the following table:

| \( O_1 \) | X | \( O_2 \) | \( O_3 \) | \( O_4 \) |
|----------|---|----------|----------|----------|

Description:

\( O_1 \) and \( O_3 \) = The initial ability of students before being given treatment.

\( O_2 \) = The final ability to students after being treated with Macromedia Flash media.

\( O_4 \) = The final ability to control class students after being treated using conventional learning.

The population in this study were 30 students of Class 1 at SDN Bina Harapan as an experimental class and Class 1 at SDN 1 Sudimampir as a control class. Data collection methods used are observation, testing, and documentation. The data analysis technique of learning outcomes in improving students' numeracy used is a descriptive statistical technique through the results of student grades consisting of the lowest value, highest score, average, and standard deviation. Hypothesis testing uses the Mann Whitney U test to determine whether there is a significant difference between the results of the pretest and the posttest results of students using Macromedia Flash-based media and the results of the pretest with...
RESULTS AND DISCUSSION

Results

Analysis of research that has been done in class 1 SDN Bina Harapan as an experimental class and class 1 SDN 1 Sudimampir as a control class given math problems in addition to 1 to 20. In the experimental category, learning is carried out using Macromedia Flash media. As for the control class, education is carried out conventionally using blackboard media. This, of course, can produce different data.

Analysis Prerequisite Test Results

Descriptive Analysis

Assessment of learning outcomes in improving students' math skills is given before and after treatment. Assessment is measured using a questionnaire in the form of an inquiry. Each survey consisted of 10 multiple choice questions regarding the sum of 1 to 20. The results of the descriptive statistical analysis of student learning outcomes in increasing numeracy skills in mathematics in the experimental class and the control class that used Macromedia Flash-based learning media and used conventional whiteboard media. The results of the research data are in the following table:

Table 2. The results of the descriptive analysis of the statistical scores of learning outcomes in increasing the numeracy ability of students in the Experimental and Control Classes

| Statistics          | Experimentation Class | Control class |
|---------------------|-----------------------|---------------|
|                     | Pretest    | Posttest  | Pretest | Posttest  |
| Total Population    | 30         | 30       | 30      | 30        |
| Lowest Value        | 30         | 60       | 40      | 60        |
| The highest score   | 70         | 100      | 70      | 90        |
| Average value       | 57,7       | 88       | 59,3    | 79        |
| Standard Deviation  | 11,4       | 11,9     | 11,1    | 11,8      |

Normality Test

Normality Testing is done by the Shapiro-Wilk Test using the SPSS 21 application. This is done to determine whether the data is normally distributed or not. If the probability value of the data (Sig) > α is significant (0.05), then the information is typically distributed. But if the probability data value (Sig) < α significant level (0.05), then the data is not normally distributed. The results of the analysis of the Normality Test on the pretest and
posttest data of the experimental class obtained data probability values (Sig) = 0.001. While the results of the analysis of the Normality Test on the pretest and posttest data of the control class obtained the amount of the probability data (Sig) = 0.000. This causes the results of the pretest and posttest data in the experimental class and the control class to be distributed abnormally. Therefore, to test the hypothesis in this study using non-parametric statistics with the Mann Whitney test.

**Hypothesis Test Results**

**Hypothesis Testing**

Hypothesis testing is done on the pre-test and post-test data. The test on the pretest data is done to find out whether there is a difference or not in the students' numeracy ability between the experimental class and the control class. If the data probability value (Sig) > α significant level (0.05) then H₀ is rejected and H₁ is accepted. But if the probability data value (Sig) < significant level (0.05) then H₀ is approved, and H₁ is rejected. H₀ in this test means that there is no difference in the pretest in the experimental class and the control class. While H₁ means that there is a difference in the pretest in the experimental class and the control class.

The results of the analysis of the hypothesis test on the pretest problem using the Mann Whitney Test obtained the Asymp value. Sig. (2-tailed) = 0.532 and significance level α = 0.05. Then H₁ is rejected, and H₀ is accepted. Then there is no difference in the pretest scores in the experimental class and the control class. This means that the initial ability of students to count the sums of 1 to 20 is the same.

Then the test on the posttest data is performed to find out whether or not there is a difference in students' numeracy skills between the experimental class and the control class. If the data probability value (Sig) > α significant level (0.05) then H₀ is rejected and H₁ is accepted. But if the probability data value (Sig) < significant level (0.05) then H₀ is accepted, and H₁ is rejected. H₀ in this test means that there is no difference in the posttest in the experimental class and the control class. Where as H₁ means that there are posttest differences in the experimental class and the control class. The results of the analysis of the hypothesis test on the posttest problem using the Mann Whitney test obtained the Asymp value. Sig. (2-tailed) = 0.005 and Significance Level α = 0.05. Then H₀ is rejected, and H₁ is accepted. Then there are differences in posttest scores in the experimental class and the control class. This means that the students' final ability in counting the sums of 1 to 20 is different. So it was concluded that learning media based on Macromedia Flash had a
significant positive effect on students' numeracy skills in the addition of 1 to 20 grades 1 in Bina Harapan Elementary School in addition to 1 to 20.

Discussion

Discussion of various research results and testing of hypotheses about increasing students' numeracy skills in the summing material 1 to 20. Macromedia flash-based learning media applied to the experimental class and whiteboard media with conventional methods used to the control class show a different effect on the results. Learn to improve students' numeracy skills. Research data can be known from data analysis. The analysis is descriptive, normality analysis, and Mann Whitney analysis.

From the descriptive analysis data, the learning outcomes in numeracy ability in grade 1 students at SDN Bina Harapan as the experimental group were higher than students in grade 1 at SDN 1 Sudimampir as the control class. This review is based on the average value of experimental class students after being treated is 88 in the big category, and the average value of control class students after being treated is 79 in the medium category. The results of the normality data show the probability value in the pretest and posttest between the experiment class and the control class that is data (Sig) < significant level (0.05) so that the data is not normally distributed. The results of the analysis of the Man Whitney test data on the pretest between the experimental class and the control class obtained the Asymp value. Sig. (2-tailed) = 0.532 and Significance Level $\alpha = 0.05$. Then $H_1$ is rejected, and $H_0$ is accepted so that the initial abilities of students in the experimental class and the control class are the same while the results of the analysis data of the Man Whitney test on the posttest between the experimental class and the control class obtained the Asymp value. Sig. (2-tailed) = 0.005 and Significance Level $\alpha = 0.05$. Then $H_0$ is rejected, and $H_1$ is accepted. Of course, this data results in differences that lead to significant changes.

The change from the influence of flash-based learning media is caused because this media can attract students' attention to the maximum. According to Anggra Yuda Ramadianto (in Saepuloh 2018) Macromedia flash has advantages over other media, namely the material presented in the form of colorful images, moving animations, music, and videos. Thus, students will be motivated in calculating the addition of article 1 to 20. The causes the material presented is delivered systematically so that it can optimize time. While on the blackboard media using conventional methods can make students feel bored, and the material presented will not be long remembered by students. With this difference, the Macromedia
flash-based learning media has a positive influence on increasing the numeracy ability of students in grade 1 at SDN Bina Harapan.

CONCLUSION

Based on the results of the study, it can be concluded that the learning media based on Macromedia Flash has a significant positive effect on the numeracy ability of grade 1 students of Bina Harapan State Elementary School on the addition of material 1 to 20. This is seen from descriptive analysis data, normality analysis, and analysis Mann Whitney. Descriptive statistical data show that the average value = 88 in the experimental class is greater than the average value = 79 in the control class. The results of the data from the normality analysis show that the data (Sig) <α significant level (0.05). The results of the Man Whitney analysis on the pretest data obtained the Asymp value. Sig. (2-tailed) = 0.532 greater than the Significance level α = 0.05 so that the students' initial ability to count in the experimental class and the control class are the same. While the results of the Mann Whitney analysis on postest data obtained Asymp values. Sig. (2-tailed) = 0.005 less than the significance level α = 0.05. So Macromedia flash-based learning media has a positive influence on increasing the numeracy ability of students in grade 1 at SDN Bina Harapan.

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