Al Khawarizmi: Jurnal Pendidikan dan Pembelajaran Matematika

ISSN 2549-3906
E-ISSN 2549-3914

The Effect of Utilizing *Macromedia Flash* as a Teaching Media for Delivering Integer on The Learning Outcomes of The Seventh Graders of Mts Miftahul Ulum Pelangwot

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Abstrak

Tujuan dari penelitian ini adalah untuk mengetahui ada tidaknya pengaruh yang signifikan media pembelajaran bilangan bulat berbantuan *Macromedia Flash* pada hasil belajar siswa kelas VII MTs Miftahul Ulum Pelangwot. Metode penelitian adalah eksperimen dengan *design control one group pre-test post-test design*. Instrumen penelitian ini yaitu soal *pretest* dan *posttest*. Teknik analisis yang digunakan adalah Uji Validitas, Uji Reliabilitas, dan Uji Hipotesis mengunakan uji-t *Paired Sample T-Test* atau pengujian hipotesis berpasangan. Hasil uji validitas instrumen oleh validator ahli, menyatakan bahwa instrumen layak digunakan. Hasil uji normalitas, nilai signifikansinya adalah 0,2 dimana 0,2 lebih dari 0,05 maka data berdistribusi normal. Pada hasil uji *Paired Sample Test*, nilai $t_{hitung} > t_{tabel}$ atau 5,950>2,160, sehingga dapat disimpulkan bahwa terdapat pengaruh yang signifikan media pembelajaran bilangan bulat berbantuan *Macromedia Flash* pada hasil belajar siswa kelas VII MTs Miftahul Ulum Pelangwot.

Kata kunci: Bilangan bulat, Media pembelajaran, Macromedia Flash

Abstract

This study aimed to see the significant effect of utilizing Macromedia Flash as a teaching media for delivering integer on the learning output of the seventh graders of MTs Miftahu Ulum Pelangwot. It was an experimental research with a control design of one group pre-test post-test design. Hence, it used pre-test and post-test questions as the research instrument. Some tests including validity test, reliability test, and hypothesis test using Paired Sample T-test were all applied for data analysis. The research instrument was validated by an expert validator who confirmed that it was proper to use. The significant result of normality test was 0,2, which was more than 0,05, indicating that the data was normally distributed. The result of Paired Sample Test was $t_{count} > t_{table}$ referring to 5,950>2,160. Therefore, it concluded that the significant effect of utilizing Macromedia Flash as a teaching media for delivering integer on the learning outcomes of the seventh graders of MTs Miftahul Ulum Pelangwot obviously existed.

Keywords: *Integer, Teaching Media, Macromedia Flash*

INTRODUCTION

Teaching media is means to support the process of teaching. Khairani in Ramadhani, et al (2021: 343) defines that teaching media one factor that contributes to a successful teaching process in schools, as it assists the process of delivering information from teachers to students or the vice versa. Teaching media facilitates students' learning process that may bring effects on their learning outcomes (Iffah, 2021; Musabik et al., 2021; Tristanti et al.,

2021). With technology of multimedia, therefore, it is expected that students can be more convenient to decide what and how they can absorb information effectively and efficiently.

The purpose of national education, as mentioned in Article 3 of Act No. 20/ 2003 about National Education System that National Education works for developing competences and creating characters as well as nation's dignified culture in order to educate nation's life, is to develop students' competences to become faithful, noble, healthy, intelligent, skillful, creative, and independent human, as well as responsible and democratic citizens. To realize the goals of Act No. 23/2003 about National Education System, it is now the time for schools –as one department of education- to work for preparing qualified human resources.

In this case, schools should not only have to develop students' cognitive but also their affective and psychometrics. One alternative that may help students to do much exploration in limited time is by utilizing media of computer with various relevant software. Particular software is ideally useful for teaching high accuracy concepts, repetitive principles, and graphical solutions in effective and efficient ways. Sophisticated Computer-based teaching media involves *text, graphic, audio,* and *video* produced, packed, displayed, and utilized interactively through computer. Such teaching media of mathematics is called interactive multimedia-based mathematics teaching media (Khuzaini & Santoso, 2016).

Mathematics is one subject that may drill students' critical thinking. With this subject, students will be able to have logical, analytical, systematical, critical, and creative thinking. as well as the capability in teamwork (Depdiknas, 2006). Teaching and learning process in schools is often conventional due to limited facilities. Students merely get the materials of a subject matter from their teacher before getting some tasks to complete. This happens repetitively and without any assistance of means and media. Therefore, it needs innovations of technology to give better understanding and more meaningful learning experiences for students. one technology of multimedia that can be useful for making technology-based teaching media is *Macromedia Flash.* It is a multimedia platform and software o make animations, games, and any internet enrichment applications that can be seen, played, and applied in Adobe Flash Player (Hodiyanto, *et al*, 2020). *Macromedia Flash* is a program to make animations and professional web apps. Furthermore, it is useful for making games, cartoon, and any other interactive multimedia apps such as product demo and interactive tutorial. The plus point of *Flash* lies on its capability to create moving and

audio animations. In the beginning of its development, *Flash* mostly worked for website animation. Nowadays, its function is extensive in education sector, especially for media of teaching due to its positive advantages. *Macromedia Flash* is a combination of teaching concept and audio-visual technology that may produce new features for the sake of education. Multimedia-based teaching is definitely able to display subjects in more interesting way, not monotonous, and easy to understand. Students will be able to learn some subjects individually by multimedia-assisted computer.

Learning outcomes is crucial in teaching process, and it is resulted from interaction of teaching and learning (Fajri et al., 2020; Maknuni, 2017). Following Hasan, *et al* (2021: 3-4), teachers should create a creative and innovative teaching media to deliver the subject materials to their students. Utilizing an appropriate teaching media may improve interaction, avoid students from any boredom, and make them feel interested during the teaching process. As the result, it may optimally increase the quality of students' learning outcomes. Some studies of developing *Macromedia Flash* have ever been conducted. The development was along with some push button switches that connected *slides* to display the media results. Masykur, *et al*. (2017) found that developing *Macromedia Flash* for media of teaching by giving some animations to encourage students' motivations to learn particular subject, in addition to relevant simulations related to daily activities that may stimulate their way of thinking. Moreover, Miftakh in Saputra & Permata (2018) studied about the effectiveness of media on students. In technical quality aspect (experiment on students), the number of students who reached KKM was 79,75% with coefficient of correlation at 0,668%, indicating a positive correlation between students' response and test result. Septian *et al.* (2021) found that the percentage level of theoretical validity of *Macromedia Flash*-based mathematics teaching multimedia was 76% consisting of expert validators on material and media. They confirmed that *Macromedia Flash* was ideal as multimedia of teaching. Nelwati, *et al.* (2019), in their study argued that this media could stimulate students to manipulate concepts and see the real forms of abstract mathematics concepts (Yolanda & Wahyuni, 2020).

Towards this current study, it used integer. It was selected due to the fact that students remained having trouble in calculating positive integers, in addition that this material was useful for understanding other materials. Thus, integer is an important subject. MTs Miftahul Ulum Pelangwot is one of many schools that had not yet thoroughly involved media on their teaching process. Hence, teaching media was necessary there. This study

aimed to see the significant effect of utilizing *Macromedia Flash* as a teaching media for delivering integer on the learning outcomes of the seventh graders of MTs Miftahul Ulum Pelangwot.

RESEARCH METHOD

This study was an experimental research. Sugiyono (2013) defined that experimental research method aimed to investigate the effects of particular treatment on another variable in a controlled condition. Towards this current study, it applied pre-experimental research design.

Research Approach

This study uses a quantitative approach with the aim of seeing whether or not there is an effect of using macromedia flash-assisted media on student learning outcomes. The researcher used one class for research and took the pre-test and post-test scores for analysis so that they used paired sample t-test analysis. The treatment that the researcher provides is learning integers using macromedia flash.

Time and Location

This study was conducted in odd semester of the school year 2021/2022 at MTs Miftahul Ulum Pelangwot Lamongan, East Java.

Population and Sample

The population of this study was all the seventh graders of MTs Miftahul Ulum Pelangwot, while the number of sample would be selected from the population through sampling techniques. The techniques were basically classified into two kinds; *probability sampling* and *non-probability sampling*. In this case, the study applied *non-probability sampling* technique that referred to saturated *sampling*. Thus, the sample of this study was all of the seventh graders of Mts Miftahul Ulum Pelangwot that consisted of 14 students.

Procedures

This study consisted of three stages including *pre*-test, *experiment*, and *post*-test. In the first stage, *pre-test*, the students had a given task to see their initial competence. In the second stage, *experiment*, the teacher delivered the material of integer by utilizing *Macromedia Flash*. In the final stage, *post-test*, the teacher gave an instructional task that

students should complete in order to see any significant effect of the treatment on the students' learning outcomes.

Research Instrument

This study used *pre*-test and *post*-test as the research instrument. Those tests aimed to see the students' competence on integers. As the result they would have score 10 for correct answers and 0 for wrong answers. Validity of this study referred to the instruments to be validated by an expert validator who was a lecturer of mathematics education program in master degree of STKIP PGRI Jombang. In this case, the *pre-test* and *post-test* was validated by Dr. Lia Budi Tristanti, S.Pd., M.Pd. As the result, she confirmed that the data was valid although it had revision on the task instruction. She asked the author to change the italic font with no exclamation mark into upright one completed with exclamation mark since it was an instruction with imperative sentence

Techniques of Data Analysis

This study applied quantitative data analysis which involved processing and displaying data, having calculation to data description, hypothesis testing through statistical test.

1. Test of Validity

   Test of validity aims to confirm the validity of the research instrument. It should be validated by expert validators. In this study, the validator was the lecturer of mathematics education program in master degree of STKIP PGRI Jombang.

2. Test of Reliability

   This test aims to measure and confirm that a concept was either relatively consistent or not for repetitive measurement. The analysis is through SPSS using normality test. The test aims to see the distribution of data in a cluster and would be analyzed whether or not the data is normally distributed. The statistical normality test of this study applied Kolmogorov-Smirnov. The application of parametric method for data analysis required normally-distributed data. Otherwise, it would use non-parametric method if the data was not normally distributed. Towards the normality test of this study, the condition was as follow:

   If the probability (Asymp.Sig) < 0,05, the data was not-normally distributed. Otherwise, if the probability (Asymp.Sig) > 0,05, the data was normally distributed.

3. Test of Hypothesis

Hypothesis testing in this study uses SPSS assistance on the paired sample t-test or paired hypothesis testing, which is characterized by one individual being given two different treatments Sugiyono (2013). In this study, the same students were given pre-test and post-test which were carried out before and after learning with macomedia flash The hypotheses of this study were as follow.

Ho : There is no significant effect of integer learning media assisted by Macromedia Flash on class VII students of MTs Miftahul Ulum Pelangwot.

Ha : There is a significant effect of learning media on integers assisted by Macromedia Flash on class VII students of MTs Miftahul Ulum Pelangwot.

Testing these hypotheses aimed to see the significant effect of utilizing *Macromedia Flash* as a teaching media for delivering integer on the learning outcomes of the seventh graders of MTs Miftahul Ulum Pelangwot. The test was through *pre-test* and *post-test*. The result of data analysis was based on the probability as follow:

if the Sig. (2-tailed) score >0,05, H_0 was supported and H_a was not supported. Otherwise, if the Sig (2-tailed) score < 0,05, H_0 was not supported and H_a was supported.

RESUT AND DISCUSSION

Result

The accurate selection of teaching method and media is very influential on students' learning outcomes besides their perception itself. Therefore, Hasan, *et al.* (2021:13), considered that, in addition to focusing on the complexity and peculiarity of learning process, understanding the essence of perception as well as various factors that might affect the explanation of perception must be optimally attained for the sake of an effective teaching process. Hence, in order to select media appropriately that attracted students' attention and provided clarity on observed objects, *Macromedia Flash* for delivering integer in operations of addition was then selected since it corresponded to the instructional subjects for the seventh graders.

Studying *Macromedia Flash* as teaching media began with data analysis that consisted of reliability test, and hypotheses test. The result of data analysis was described below. The collected sample would be analyzed by several tests that consisted of reliability, and hypotheses tests.

1) Test of Reliability

It aimed to measure a concept whether or not it was relatively consistent in repetitive measurement. So that if the test results produce data that is normally distributed, then parametric statistics can be used. This test applied normality test by Kolmogorov-Smirnov using SPSS software.

Table 1. Normality test with One-Sample Kolmogorov-Smirnov Test

One-Sample Kolmogorov-Smirnov Test			
		pre_test	post_test
N		14	14
Normal Parameters[a,b]	Mean	58,5714	81,4286
	Std. Deviation	20,32700	12,31456
Most Extreme Differences	Absolute	,163	,185
	Positive	,163	,180
	Negative	-,122	-,185
Test Statistic		,163	,185
Asymp. Sig. (2-tailed)		,200[c,d]	,200[c,d]
a. Test distribution is Normal.			
b. Calculated from data.			
c. Lilliefors Significance Correction.			
d. This is a lower bound of the true significance.			

Based on the result of normality test presented on Table 1, it found that, in *pre-test*, the mean score of the sample (N=14 respondents) was 58,5714, the standard deviation was 20,32700, the score of *statistic test* was 0,163, and the significant value was 0,2. In *post-test*, however, it found that the mean score of the sample (N=14) was 81,4286, the standard deviation was 12,31456, the score of *statistic test* was 0,185, and the significant value was 0,2. As the significant value of both *pre-test* and *post-test*, which referred to 0,2, was more than 0,05, it concluded that the data distribution was obviously normal since it had reached the assumption of normality.

2) Test of Hypotheses

This sudy applied *t*-test as the number of sample was less than 30. The result of this test using SPSS was as follow.

Table 2. Hypotheses Test with *Paired Samples Statistics*

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	pree_test	58,5714	14	20,32700	5,43262
	post_test	81,4286	14	12,31456	3,29120

Table 2 showed that the mean score of *pre-test* was 58,5714, with the number of sample was N=14, standard deviation was 20.32700, and the standard *error* was 5,43262. Meanwhile, the mean score of *post-test* was 81,4286, the number of sampel N=14, standard deviation was 12,31456, and standard *error* was 3,9120.

Table 3. Hypotheses Test with *Paired Samples Correlations*

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Pre-test & post-test	14	,716	,004

Based on Table 3, it found that, among the number of sample (N=14), the correlation score was 0,716, and the significant value was 0,004. Next, hypotheses test with *paired samples test* was conducted, as follow.

Table 4. Hypotheses Test with *Paired Samples Test*

Paired Samples Test									
		Paired Differences					T	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	pree_test - post_test	-22,85714	14,37336	3,84144	-31,15607	-14,55821	-5,950	13	,000

As seen on Table 4, it showed that the *mean* score was -22,85714, the standard deviation was 14,37336, with the lowest interval value at -31,15607 and the highest one at -14,55821. The result of *paired sample t-test* showed that the significant value was 0. The consideration of data analysis was based on a probability that if the Sig. (2-tailed) score <0,05, H_0 was not supported while H_a was supported. Based on the result, it confirmed that H_0 was not supported while H_a was supported since the significant value was less than 0,05. Therefore, it concluded that utilizing *Macromedia Flash* as a teaching media for delivering integer had significant effect on the seventh graders of MTs Miftahul Ulum Pelangwot.

As seen on Table 4, the result of *paired sample test* showed that t_{count} was -5,950. The score was negative due to the fact that students' *pre-test mean* score was less than their *post-test*. In this case, the score of t_{count} could be positive, so that the score of t_{count} turned

into 5,950. Moreover, the score of t_{table} could be found based on Df (Degree of freedom) score and significance value ($\alpha/2$). As seen on Table 4, the Df score reached 13, and 0,05/2 was equal to 0,025. Furthermore, the score of t_{table} was 2,160. Since the score of $t_{count} > t_{tabel}$ or 5,950 > 2,160, it indicated that H_0 was not supported and H_a was supported. This result concluded that utilizing *Macromedia Flash* as a teaching media for delivering integer brought significant effect on students' learning output of the sevent graders of MTs Miftahul Ulum Pelangwot

Discussion

This study resulted that there was a significant effect when using macromedia flash on student learning outcomes in learning integer material. It was consistent to Umam who suggested that Macromedia Flash software could bring effect on students' learning oucomes (Umam & Yudi, 2016). Macromedia flash is a media that has an attractive appearance and is presented in various colors. So that when this media is applied it will attract the attention of students to take part in learning. Indirectly, students' learning motivation will increase and students tend to more easily understand the material (García et al., 2007; Wardani & Setyadi, 2020).

Macromedia flash is an interesting learning media to apply, practical and effective media applied for learning. Macromedia flash can also increase motivation and student learning outcomes, both cognitive and affective (Fahmi, 2014; Handayani et al., 2018; Hotimah et al., 2021; Khairani & Febrinal, 2016; Mardhatillah & Trisdania, 2018; Rahmi et al., 2019; Safitri et al., 2013; Wardani & Setyadi, 2020). This is in line with the results of the research conducted by researchers which resulted in the effect of using macromedia flash on student learning outcomes.

CONCLUSION

Based on the result of data analysis it indicated that teaching media assisted by *Macromedia Flash* for delivering integer brought significant effect on students' outcomes for the seventh graders of MTs Miftahul Ulum Pelangwot. In addition, some suggestions that further researches might put into consideration were: (1) the importance of training for

teachers to have adequate insights and competence in selecting appropriate media that correspond to the subjects they teach as well as the teaching objectives to be attained in teaching process; (2) the importance of further studies that optimize *Macromedia Flash* for the other subjects of mathematics in order to improve students' learning output; and (3) the importance of surveys about the utilization of teaching media in more effective way on its development.

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