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THE EFFECTIVENESS OF EDPUZZLE-BASED AUDIO VISUAL LEARNING MEDIA TO IMPROVE MATHEMATICAL PROBLEM SOLVING ABILITY

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ABSTRACT

This research aims to determine the effectiveness of edpuzzle-based audio visual learning media to improve mathematical problem solving abilities. Pre-experimental research method with a one group pretest and posttest design pattern. Sampling in this study used random sampling techniques. The trial was carried out on 10 class VIII junior high school students. The research instrument is a description test. The data to be analyzed is first tested for the prerequisite, namely the normality test, because the pretest and posttest are not normally distributed, data analysis uses a non-parametric statistical test, namely the Wilcoxson test. Based on the results of the Wisconsin test, the Asymp value was obtained. signature. (2-tailed) is 0.024 < 0.05 so Ho is rejected, which means there is a difference before and after using Edpuzzle-based audio visual learning media, meaning it can be said that the media that researchers have developed is effective for use in learning.
Keywords: Learning Media, Edpuzzle, Mathematical Problem Solving.

INTRODUCTION

The Covid-19 pandemic has an impact on all aspects of life, one of which is the world of education. The government issued a new policy regarding learning during Covid-19, namely a policy to stay at home such as working from home (WFH) and all activities related to associations were eliminated and replaced with online media. The Minister of Education and Culture of the Republic of Indonesia (Kemendikbud) on March 24 2020 issued circular letter Number 4 of 2020 concerning the learning process carried out from home through online learning in the context of preventing the spread of Covid-19 (Kemendikbud, 2020).

In accordance with circular number 4 of 2020, SMP Negeri 9 Cirebon City is implementing a blended learning system to prevent the spread of Covid-19. This is reinforced by the results of observations at school and interviews conducted by researchers with the deputy principal for student affairs at SMP Negeri 9 Cirebon City on March 22

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2020, saying that the school is currently implementing 50% learning or what is commonly known as blended learning, a week face to face. and a week of distance learning (PJJ). One class is divided into 2 waves, the first wave is from absences one to fifteen, the second wave is from absences 16 – 30. Face-to-face learning at school uses textbooks, Student Worksheets (LKS) and teaching aids as learning media and for distance learning The media used is WhatsApp group. Based on information obtained after conducting an interview with the class VIII mathematics teacher at SMP Negeri 9 Cirebon City, he said that "the media used during distance learning is by teachers providing material via WhatsApp groups in the form of PDF files, PowerPoint and sometimes sending YouTube links, after that they will given assignments as an alternative so that students can still study even at home."

During distance learning, of course, many problems arise because conditions occur suddenly and are not normal, causing all education administrators to feel confused about this distance learning system, so that many problems arise and impacts occur during distance learning. Problems that occur during distance learning are students' lack of understanding in using technology, inadequate internet networks cause online learning to not run smoothly so that the material is not delivered well (Adi, 2020). Another problem that arises is students' lack of understanding of the material provided by teachers because teachers only give assignments without first providing an explanation of the material, while not all parents are able to educate their children, causing a decline in student learning outcomes. results (Intanuari, 2020)

Problems resulting from the Covid-19 pandemic also occurred at SMP Negeri 9 Cirebon City, during distance learning (PJJ) there were still several students in each class who did not have cellphones, several students who rarely submitted assignments, and the level of student decline. understanding of the material. which is classified as low, because the teacher only provides material without explaining the material again. Another problem raised by students, when given a YouTube link containing a learning video, most students don't really understand the video because there are several parts that are skipped, if there are parts that are skipped it will certainly reduce the effectiveness of learning with the video because there are some parts that have not been students learn.

Another problem is the low ability of students to complete mathematical problem solving. This is reinforced by the opinions of several class VIII students who said that "I found it difficult when solving story problems because I was confused about which formula

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to use to answer the questions." Students also thought that "when answering math story questions I felt confused because there were too many sentences so I didn't understand what was being asked and which formula to use."

This is in line with the results of research conducted by Suraji (2019) on class VIII students at SMP IT Dar Al-Ma'arif Pekanbaru which stated that junior high school students' mathematical problem solving abilities were still low, especially in applying them in everyday life. Based on the results of analysis conducted by two international studies, namely Trends in International Mathematics and Science Study (TIMSS) and Programing for International Student Assessment (PISA), it is proven that problem solving abilities in Indonesia are still low (2018). The Ministry of Education and Culture (Haloho, 2016) stated that in the 2015 TIMMS results report, Indonesian students were in 46th position out of 51 countries. PISA research results in 2018 showed that Indonesian students' mathematics scores were ranked 72nd out of 78 countries with an average score of 489 (OECD, 2018). The mathematics questions in the PISA study mostly measure reasoning, problem solving and argumentation abilities. More than half of Indonesian students, namely 75.7%, have low performance and are only able to solve the simplest problems where the context is still general and only 0.1% are able to develop and work on mathematical models that require thinking and problem solving skills (2018).

The problems that occur during the pandemic should be a challenge for educators to be able to continue teaching in the midst of the pandemic. One effort to overcome problems during distance learning is to use innovation in learning media, especially in the era of revolution 4.0, developments in information, technology and communication are increasingly rapid, it is hoped that teachers can apply them as media in learning. Innovation in learning media can utilize technology and the internet for learning media, this will provide a different atmosphere which can increase students' enthusiasm for learning in the midst of this pandemic.

One of the learning media to overcome the problems described above is edpuzzle-based audio visual learning media. Edpuzzle is an audio-visual learning platform that allows educators to edit videos, cut and record sound and add questions to the video. This edpuzzle has many advantages, including students cannot skip or skip learning videos, teachers can add interactive components by asking questions in the video, questions can be multiple choice or essays and teachers can find out the percentage of students while watching the

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video (Qadriani et al. al., 2021). Based on the background described above and previous research, the researchers conducted research with the title "Effectiveness of Edpuzzle-Based Audio Visual Learning Media to Improve Mathematical Problem Solving Ability".

METHODS

This research was conducted from 2 to 26 August 2022. The research method used in this research is a pre-experimental design using one group pre-test and post-test design. In this research, before implementing learning using edpuzzle-based media, participants were given pre-test questions to see the students' initial abilities. then after the pre-test, treatment was carried out several times using Edpuzzle-based audio visual learning media and in the final stage, students were asked to fill in post-test questions to determine the effect of Edpuzzle-based audio visual learning media on learning outcomes after being given treatment. The effectiveness of edpuzzle-based audio visual learning media can be seen from the difference between the pre-test and post-test scores.

The sample in this study was taken using random sampling. The sample used in this research was 10 students from class VIII-E. Data collection techniques use mathematical problem solving tests. This test takes the form of a description of 5 items and refers to student indicators in solving problems related to number patterns. The following is a scoring rubric for a mathematical problem solving ability test :

Table 1. Rubrik Penskoran Tes Pemecahan Masalah Matematis

Aspek yang dinilai	Skor	Keterangan
Memahami Masalah	0	Tidak menyebutkan apa yang diketahui dan apa yang ditanyakan.
	1	Menyebutkan apa yang diketahui tanpa menyebutkan apa yang ditanyakan atau sebaliknya.
	2	Menyebutkan apa yang diketahui dan apa yang ditanyakan tetapi kurang tepat.
	3	Menyebutkan apa yang diketahui dan apa yang ditanyakan secara tepat.
Rencana Penyelesaian	0	Tidak merencanakan penyelesaian masalah sama sekali.
	1	Merencanakan penyelesaian dengan menuliskan rumus berdasarkan masalah tetapi kurang tepat.
	2	Merencanakan penyelesaian dengan menuliskan rumus berdasarkan masalah secara tepat.
Melaksanakan Rencana	0	Tidak ada jawaban sama sekali.
	1	Melaksanakan rencana dengan menuliskan jawaban tetapi kurang tepat.
	2	Melaksanakan rencana dengan menuliskan jawaban setengah dan sebagian besar jawaban benar
	3	Melaksanakan rencana dengan menuliskan jawaban dengan lengkap dan benar.
Menafsirkan Masalah	0	Tidak menuliskkan kesimpulan.
	1	Menafsikan hasil yang diperoleh dengan membuat kesimpulan tetapi kurang tepat.

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	2	Menafsikan hasil yang diperoleh dengan membuat kesimpulan secara tepat.

(Sumber : Adaptasi dari Hamzah, 2014)

The method for calculating the final score is as follows :

$$N = \frac{acquisition\ score}{Maximum\ Score} \times 100$$

The problem solving ability value obtained from the calculation is then qualified according to the following table:

Table 2. Kualifikasi Pemecahan Masalah

Nilai	Kualifikasi
85,00 - 100	Sangat Baik
70,00 – 84,99	Baik
55,00 – 69,99	Cukup
4,00 – 54,99	Kurang
0 – 39,99	Sangat Kurang

(Adaptasi dari Japa, 2008)

The data analysis technique used is the prerequisite test, namely the normality test. If the significance value is > 0.05 then it is normally distributed & if the significance value is < 0.05 then it is not normally distributed. Next, to test the hypothesis, use the paired t-test if it is normally distributed, but if the pretest and post-test are not normally distributed, then data analysis uses a non-parametric statistical test, namely the Wilcoxson test (Cooper & Shindler: 2014).

FINDINGS

Based on the results of research conducted at SMP Negeri 9 Cirebon on students in class VIII – E on number pattern material, the pre-test and post-test results were tested for prerequisites first using a normality test. The following is the data from the normality test :

Table 3. *Tests of Normality*

	Kolmogorov-Smirnova[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pre-Test	.338	10	.002	.789	10	.011
Post-Test	.240	10	.108	.839	10	.042

a. Lilliefors Significance Correction

The normality test used in this research is the Shapiro-Wilk normality test. Data is said to be normally distributed if the significance value is > 0.05, in Table 4.8 the pre-test significant value is 0.011, meaning 0.011 < 0.05, so the Pre-Test value is not normally distributed. The significant Post-Test value is 0.043, meaning 0.043 < 0.05, so the Post-Test value is not normally distributed, so it can be concluded that the pre-test and post-test are not normally distributed so a paired t-test cannot be carried out. An alternative for data that is not normally distributed is to use a non-parametric test, namely

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the Wilcoxson test (Cooper & Shindler: 2014). Data from the Wilcoxson test results can be seen in table 4.

Table 4. Test Statistics[a]

	Post-Test – Pre-Test
Z	-2.230[b]
Asymp. Sig.(2-tailed)	.024

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

The effectiveness of Edpuzzle-based audio visual learning media to improve mathematical problem solving abilities can be seen from the results of the Wiscoxson test, Asymp value. Sig. (2-tailed) is 0.024 < 0.05 so Ho is rejected, which means that there is a difference before and after using Edpuzzle-based audio visual learning media, meaning it can be said that the media that researchers have developed is effective for use in learning. This can be seen from the results of the post-test scores that have been carried out that there has been an increase in scores after carrying out several treatments. This is also supported by previous research conducted by (Silverajah & Govindaraj, 2018) it is said that the teaching and learning process using edpuzzle has good results in increasing student learning independence. Research conducted by (Sirri & Lestari, 2020) shows that students enjoy learning mathematics using the edpuzzle application and test results show that students are able to work on probability material questions after watching learning videos on edpuzzle. According to research (Sunami & Aslam, 2021) that students' interest in learning increases by utilizing interactive animated video learning media and the edpuzzle application is an interactive learning media so that the results of this research are in line with the results of the questionnaire.

CONCLUSION AND SUGGESTION

Based on the results of the research that has been carried out, it can be concluded that audio-visual learning media based on edpuzzle can improve students' mathematical problem solving abilities. This can be seen from the learning activities presented in audio-visual form using edpuzzle which can stimulate students' knowledge and abilities in mathematical problems and is proven by the results of trials using non-parametric tests, namely the Wilcoxson test with Asymp values. Sig. (2-tailed) is 0.024 < 0.05 so Ho is rejected, which means that there is a difference before and after using Edpuzzle-based audio visual learning media, meaning it can be said that the media that researchers have developed is effective for use in learning.

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