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The Effect of Interactive Learning Media Based on Mathplayground on the Learning Outcomes of the Students of Fraction Material Class IV SDN Kedung Dalem III

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Abstract: This study aims to determine the effect of interactive learning media based on Math Playground on student learning outcomes on fraction materials in class IV SDN Kedung Dalem III. The problem studied is whether there is a significant influence between the use of interactive learning media based on Math Playground on student learning outcomes in grade IV SDN Kedung Dalem III. This study uses a quantitative method with a one group pretest-posttest design. The sample of this study were fourth grade students of SDN Kedung Dalem III, totaling 17 students. The research instrument used is a test (Pretest-Postest) of student learning outcomes on fraction material, which consists of 10 multiple choice questions. The results of the analysis using the wilcoxon test show that the sig value (2 tailed) is 0.000 which indicates significance <0.05 so that H0 is rejected and H1 is accepted. This shows that the interactive learning media Math Playground has a significant effect on improving student learning outcomes. The conclusion of this study is that Math Playground interactive learning media can improve student learning outcomes on fraction material. Therefore, teachers and educators can use Math Playground as an alternative learning media to improve student learning outcomes.

Keywords: Effect, Math, playgeound, Student, learning.

1. INTRODUCTION

Education plays a crucial role in improving the quality of human life through the provision of knowledge, skills, experience, values, and attitudes. (Pratiwi, 2023). In addition, education also serves to prepare human resources to face the future by developing individual potential. One indicator of educational success is student academic achievement, which is closely related to the understanding and mastery of material. (Made et al., 2024). Therefore, the transformation of the education system is needed to respond to global challenges, especially with the rapid advancement of information and communication technology (Lestari et al., 2024).

Digital education faces a number of challenges, including the digital divide, shifting learning paradigms, and data security. (Sinaga & Firmansyah, 2024). To overcome this

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challenge, innovation in learning, such as the use of interactive learning media, is an effective solution. (Serlina & Vebrian, 2024). One of the subjects that is often a challenge is mathematics, especially fraction material which is considered complex and abstract by students. (Ainaya Hanum Lutfia et al., 2023). Some of the factors that cause this difficulty include a lack of basic understanding, limited attractive learning media, and low student participation in the learning process. (Prasast et al., 2022).

Interactive learning media, such as Math Playground, can help overcome this problem by presenting material more clearly and increasing student motivation to learn. (Salimah et al., 2024). Math Playground is an interactive platform that presents math games in a fun way (Karimah & Prastowo, 2023). Previous research shows that the use of Math Playground can increase students' motivation and understanding of mathematics, as well as develop critical thinking and problem solving skills.(Wardani et al., 2024),

However, previous studies have shown that interactive media can improve motivation and understanding of mathematical concepts, although the measurable improvement is still relatively low in some cases (Muthi & Latifah, 2024). For example, research conducted by Sitti Hanima and Hurriah Ali Hasan (2024) showed that this media is effective in increasing positive attitudes and understanding of mathematics. Meanwhile, Puput Agisni Salimah dkk (2024) observed an increase in learning motivation although with limited impact. In addition, previous studies have some limitations. Some studies may not have specifically measured the impact of using Math Playground on fractions, or may have been conducted in a different environment to SDN Kedung Dalem III. In addition, some studies may not consider other factors that can affect student learning outcomes, such as learning style or socioeconomic background.

At SDN Kedung Dalem III, many students experience difficulties in understanding mathematics, which is reflected in low exam results and passive learning behavior. To address this problem, this study aims to explore the effect of using Math Playground on students' learning outcomes in fraction material in grade IV of SDN Kedung Dalem III. This study specifically examines the effect of Math Playground on learning outcomes in

fractions, which is an area that is often difficult for students. This research was conducted at SDN Kedung Dalem III, so the results are relevant to the local context and can provide recommendations that are specific to the school.

This research is expected to provide new insights into the effectiveness of using interactive learning media in improving math learning outcomes. This research is expected to provide alternative solutions for teachers in delivering Mathematics learning materials.

2. LITERATURE REVIEW

Sitti hanima and Hurriah ali hasan(2024) with the title "Improving Student Numeracy Through Edutainment Math Playground: Campus Teaching Program Batch 7" states that the implementation of Edutainment Math Playground has shown positive results. Students not only experienced an increase in understanding of mathematical concepts, but also showed a higher interest and a more positive attitude towards learning mathematics.

Puput agisni salimah et al (2024) in his research entitled "Application of Math Playground Media in Increasing the Motivation of Learning Mathematics for Grade V Elementary School Students" states that the use of math playground media can increase student learning motivation which ultimately has an impact on improving student learning outcomes, however, the increase is still classified in the low category.

Ainaya Hanum Lutfia et al (2023) with the title "Analysis of the Utilization of Math Playground Media in Learning Grade 1 Mathematics Subtraction Material" this study shows that through this Math Playground media students become enthusiastic and enthusiastic in participating in learning mathematics which is usually a subject that is not liked by students because it is considered difficult to be a fun subject.

From some of the previous studies above, it shows that the use of MathPlayground media can have a positive impact on math learning, such as increasing understanding of mathematical concepts, learning motivation, and positive attitudes of students. However, further research is still needed to understand more deeply the effect of Math Playground media on student learning outcomes. Filling the gap in previous research, this study specifically

examines the effect of interactive learning media 'Math Playground' on learning outcomes of grade IV students in fraction material. The uniqueness of this study lies in measuring the concrete impact of interactive media on measurable learning outcomes, providing specific empirical evidence.

3. METHODS

This research uses a quantitative approach, which processes data with statistical methods (Rashid, 2022). The focus of this research is to examine the relationship between one independent variable and one dependent variable. Researchers used an experimental method, which aims to determine the exact effects that occur due to certain treatments.(Ibrahim, 2018:55). The research design used is one group pretest-posttest design, where all students will take two tests, namely before and after being given treatment in the form of using Math Playground learning media. The results of these two tests will be compared to see if there is an increase in student learning outcomes after using the media.

The population in this study were fourth grade students of SDN Kedung Dalem 3, totaling 17 people. The sample in this study used the saturated sample method, in which all members of the population were included in the sample. This method is usually applied to small populations, which are less than 30 people, or when researchers want to achieve a high level of precision in the generalization of research results.(Sugiyono, 2020). Therefore, with a population of 17 students, the entire population was used as a sample, resulting in a sample of 17 students.

The test results will later be processed with the help of the spss statistic 26 application. The instrument testing uses validity and reliability tests to ensure the quality of the test instrument, while the data analysis technique uses normality tests and hypothesis tests to test the effectiveness of the intervention..

4. RESULTS AND DISCUSSION

Research Instrument Testing

Validity Test

Before the research was carried out, pretest and pretest questions were tested. The question was tested on class V students of SDN Kedung Dalem III, totaling 17 students, while the pretest and posttest questions were 10 multiple choice questions. The results of validity testing using Pearson Product Moment correlation using SPPS statistics 26 produce the output listed in the following table:

Table 1 Recapitulation of the calculation of item validity

pretest postest

Question No.	T_{count}	T_{table}	Status	Criteria
1	0.651209	0.468	Valid	High
2	0.497569	0.468	Valid	Medium
3	0.702585	0.468	Valid	High
4	0.896314	0.468	Valid	Very high
5	0.494946	0.468	Valid	Medium
6	0.630254	0.468	Valid	High
7	0.560395	0.468	Valid	Medium
8	0.521176	0.468	Valid	Medium
9	0.69180	0.468	Valid	High
10	0.767167	0.468	Valid	High

Based on the results of validity testing using Pearson Product Moment correlation, it can be concluded that the questions used in the pretest and postest have good validity and can provide accurate results for research purposes.

As for data analysis using SPPS 55 statistic 26 produces Descriptive statistical output listed in the following table:

Table 2. Description of Pretest and Posttest Instrument Trials

Descriptive Statistics					
	N	*Minimum*	*Maximum*	*Mean*	*Std. Deviation*
Pretest and Posttest Scores	17	10	90	61.18	21.761

From the table above, it can be seen that the minimum value obtained is 10 while the maximum value obtained is 90. The average (mean) is 61.18 with a standard deviation of 21.761.

Reliability Test

Tabel 3. Realiability Test

Reliability Statistics	
Cronbach's Alpha	N of Items
0.840	10

Based on data analysis using SPSS statistic 26 in Table 4.5 shows the results of the reliability of the pretest and posttest test questions of 0.840. The results of this data indicate that the data is realizable.

Data Analysis Technique

Normality Test

The results of data analysis using SPSS Statistics 26 are presented in tabular form in the following table

Table 4. Normality Test of Pretest and Posttest Shapiro-wilk

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	kelas	Statistic	df	Sig.	Statistic	df	Sig.
test scores	pretest	.238	17	.011	.860	17	.015
	postest	.258	17	.004	.877	17	.029

In Table 4., the significant value on the pretest value is 0.015 and on the posttest value is 0.029. The significance level for pretest and posttest data is more than 0.05 so H0 is rejected. The results of the normality test using Shapiro-wilk show that the pretest and posttest data are not normally distributed, in hypothesis testing the Wilcoxon Test is used because the data is not normally distributed.

Hypothesis Test (Wilcoxon Test)

In testing the Wilcoxon test, the following are the acceptance or rejection criteria :

1. If sig (α) < 0.05, then H0 is rejected and Ha is accepted
2. If sig (α) > 0.05, then H0 is accepted and Ha is rejected

The hypotheses tested in this study are as follows:

H_0 : There is no effect of using interactive learning media based on Math Playground on the learning outcomes of fourth grade students of SDN Kedung Dalam 3.

H_a : There is an effect of using interactive learning media based on Math Playground on the learning outcomes of fourth grade students of SDN Kedung Dalam 3.

Analysis of learning outcomes using the Wilcoxon test with the help of SPSS 26 produced the following data :

Tabel 5. Wilcoxon Test

Test Statistics[b]

	Postest - Pretest
Z	-3.669[a]
Asymp. Sig. (2-tailed)	.000

a. Based on negative ranks.

b. Wilcoxon Signed Ranks Test

Based on Table 5, the Wilcoxon test results reveal a significance value of 0.000, which is less than 0.05. Consequently, the null hypothesis (H0) is rejected, and the alternative hypothesis (Ha) is accepted. This indicates that Math Playground interactive learning media has a significant impact on improving student learning outcomes.

5. CONCLUSIONS

The research findings suggest that the Wilcoxon test analysis yields a significant result, with a sig value (2-tailed) of 0.000, indicating significance below 0.05. Consequently, the null hypothesis (H0) is rejected, and the alternative hypothesis (H1) is accepted, revealing that Math Playground interactive learning media has a profoundly positive impact on enhancing student learning outcomes.

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