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The Influence of Interactive Learning Media with a Digital Story Telling Approach on Student Learning Outcomes in Informatics Subject at SMPN 5 Padang Panjang

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ABSTRACT

The rapid advancement of technology in the globalization era has transformed education, emphasizing the integration of innovative tools to enhance learning quality. This study investigates the influence of interactive learning media using a digital storytelling approach on student learning outcomes in Informatics at SMPN 5 Padang Panjang. It combines narratives with multimedia elements like images, audio, video, and animations to make learning more engaging and meaningful. Employing a quantitative quasi-experimental design, this research involved 62 grade VIII students: 31 in the experimental group (using interactive digital storytelling media) and 31 in the control group (conventional methods). Data were collected via pre- and post-tests, analyzed using Shapiro-Wilk for normality (Sig. > 0.05, confirming normal distribution), Levene's test for homogeneity (Sig. = 0.103 > 0.05, indicating equal variances), and independent sample t-test for hypothesis testing. Results revealed a significant difference in post-test scores: the experimental group's mean was 87.94 (SD = 7.711), compared to the control group's 82.29 (SD = 10.706). The t-test yielded t_count = 2.38 > t_table = 1.671 (df = 60, α = 0.05, Sig. = 0.020), rejecting the null hypothesis and confirming a positive, significant effect. Students in the experimental group showed high enthusiasm and active participation, particularly in understanding Computer Systems material.

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INTRODUCTION

The rapid development of technology in the era of globalization has brought significant changes in all aspects of human life. One of the fields that has experienced rapid progress is education, which aims to improve the quality of science and technology. The advancement of science and technology (IPTEK) has led to complex changes and developments. This will have a real impact on education, where education must be based on future needs through the utilization of technology. The use of technology is one of the most outstanding innovations in improving the quality of education and educators in delivering material that is more interesting so that students are free from boredom during learning.

The development of science and technology (IPTEK) has caused significant changes in the existence of learning models and patterns in education. Technology has eliminated distances and boundaries between

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individuals, groups, and countries. The Industrial Revolution 4.0, as a phase of technological revolution, has significantly influenced changes in human activities. This revolution requires humans to have the skills to predict a rapidly changing future. One of the challenges of Industry 4.0 is in education, which can be said to be Education 4.0, characterized by the use of digital technology in teaching and learning activities. Technology plays a vital role in education, including the emergence of electronic media as a source of knowledge and education center, new learning methods that facilitate students and educators, and the ability to learn without physical presence. Therefore, educators are required to master IPTEK to compete in the global world by following technological changes and using attractive learning media to stimulate students' interest.

Learning media is a crucial component of the learning process that bridges the delivery of material. The use of media will facilitate students' understanding of learning materials, creating an engaging learning experience that motivates students to learn. In the independent curriculum, teachers can choose learning media that suits students' needs. The use of learning media can stimulate students' interest and encourage them to learn.

One effective approach to integrating interactive media is through Digital Storytelling, which combines narrative with multimedia components like images, audio, video, and animation to deliver material in a more engaging and meaningful way. This approach can be applied through scenario design that represents real-world problems related to learning materials. Research has shown that Digital Storytelling has a positive impact on improving student learning outcomes.

Based on observations and field practices conducted from July to December 2024 at SMP Negeri 5 Padang Panjang, several fundamental problems were identified in Informatics learning related to the use of learning media. One of the main issues is the suboptimal use of technology in the learning process, as the current learning media does not sufficiently facilitate interactivity and visualization of material. This hinders the efficient and comprehensive analysis of student learning outcomes. Although teachers occasionally deliver information through PowerPoint presentations, observations show that textbooks remain the dominant learning resource. The tendency to deliver material in a one-way manner through PPT can reduce interaction and active involvement of students in the learning process.

METHOD

The research method used in this study is a quantitative method. In this research, there are several common design forms used, such as Pre-Experimental Design, True Experimental Design, Factorial Design, and Quasi-Experimental Design. The population in this research is all grade VIII students of SMP Negeri 5 Padang Panjang, totaling 239 people, consisting of VIII.1 with 32 people, VIII.2 with 31 people, VIII.3 with 32 people, VIII.4 with 31 people, VIII.5 with 32 people, VIII.6 with 31 people, VIII.7 with 31 people, and VIII.8 with 19 people. From the drawing results, class VIII.6 was obtained as the control class and class VIII.7 as the experimental class. All students in both classes were used as research samples, with a total of 62 people consisting of 31 students per class. Through this drawing method, it is hoped that the selected sample truly represents the population and can produce objective and accurate data. The data testing techniques are validity test, reliability test, and differentiating power test. And the data analysis techniques use normality test, homogeneity test, and hypothesis test.

RESULTS AND DISCUSSION

Research Data Description

The research involved 31 students in the experimental class and 31 students in the control class, using a learning outcomes test instrument consisting of 30 items, of which 21 items were declared valid after validity testing. Data collection for learning outcomes was conducted through tests in the form of a pretest and posttest for both groups. The test scores were then analyzed descriptively to obtain information on the mean, standard deviation, highest score, and lowest score for each group. This analysis aims to provide an initial overview of the differences in learning outcomes between the experimental class and the control class (Nining Nurahmani, 2023).

Table 1 Results of Descriptive Statistics Test

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Pretest Eksperimen	31	24	76	50.55	12.025
Posttest Eksperimen	31	76	100	87.94	7.711
Pretest Kontrol	31	24	67	42.74	10.073
Posttest Kontrol	31	62	100	82.29	10.706
Valid N (listwise)	31				

Based on the Descriptive Statistics table, the pretest mean score for the control class was 42.74 with a standard deviation of 10.073, while for the experimental class it was 50.55 with a standard deviation of 12.025. This indicates that the initial abilities of students in both classes were not significantly different, although the experimental class mean was slightly higher. After the treatment was given, the posttest mean score for the control class increased to 82.29 with a standard deviation of 10.706, while the experimental class increased higher to 87.94 with a standard deviation of 7.711. The greater increase in the mean for the experimental class compared to the control class shows that the use of interactive learning media with a digital storytelling approach has a stronger positive influence on students' learning outcomes.

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a. Normality Test

Based on the normality test results in Table 2 using the Shapiro-Wilk method, it was obtained that all pretest and posttest data, both in the control class and the experimental class, have a significance value (Sig.) greater than 0.05. Thus, the data can be said to be normally distributed and meet the normality assumption, so it is suitable for analysis using parametric statistical tests in the next stage.

Table 2. Normality Test

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest Kontrol	.125	31	.200*	.963	31	.345
Posttest Kontrol	.152	31	.067	.944	31	.104
Pretest Eksperimen	.132	31	.179	.962	31	.331
Posttest Eksperimen	.085	31	.200*	.964	31	.361

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Based on the normality test results in Table 10 using Shapiro-Wilk, all pretest and posttest data in the control class and experimental class have a significance value (Sig.) greater than 0.05. This indicates that all data are normally distributed, thus meeting the normality assumption for parametric statistical analysis to be used in the next stage.

b. Homogeneity Test

After it is known that the data is normally distributed, the next stage is to conduct a homogeneity test. This test serves as the basis for determining whether the research hypothesis is accepted or rejected, with reference to the significance value (Sig.) in the Levene statistic. If the Sig. value is greater than 0.05 (Sig. > 0.05), then the data is considered homogeneous or has the same variance. Based on the homogeneity test of the

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data that has been conducted... (see Appendix 18 page 97). The following are the results of the homogeneity test which can be seen in the table below:

Table 3. Homogeneity Test
Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
Nilai	Based on Mean	2.735	1	60	.103

Based on Table 11 above, the homogeneity of variance test obtained a significance value (Sig.) of 0.103. Because the Sig. value > 0.05, it can be concluded that the data has homogeneous or equal variance. Thus, the data from the experimental group and the control group have the same variance. Therefore, the homogeneity assumption is met, and the data is suitable for further analysis using parametric statistical tests, one of which is the independent sample t-test.

c. Hypothesis Test

After going through the normality and homogeneity tests, it was obtained that both sample classes are normally distributed and have homogeneous variance. Therefore, the analysis can proceed using parametric statistical tests, namely the independent sample t-test, to determine whether there is a significant difference between the two groups. The t-test is a parametric testing procedure for the mean of two groups of data, either for related groups or two independent groups. The t-test is a statistical test used to test the null hypothesis. The hypothesis test in this research is a two-sample hypothesis test (Two Sample) aimed at comparing whether the two variables are the same or different. The steps in the hypothesis test can be seen... (Appendix 20 page 163)

Based on the t-test results, the calculated value (t_count = 2.38) was obtained. At a significance level of 5% (α = 0.05) with degrees of freedom (df) = ((n1 + n2) - 2 = (31 + 31) - 2 = 60), the table value (t_table = 1.671) was obtained. Because (t_count > t_table) or (2.38 > 1.671), the alternative hypothesis (H1) is accepted.

Table 4. Independent Sample Test Using SPSS 21

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					
								95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Nilai	Equal variances assumed	2.735	.103	2.382	60	.020	5.645	2.370	.905	10.385
	Equal variances not assumed			2.382	54.527	.021	5.645	2.370	.895	10.395

The calculation results in Table 12 above show that the t-count value is 2.382 with degrees of freedom (df) 60 and a Sig. (2-tailed) value of 0.020 (< 0.05). Thus, it can be concluded that there is a significant difference between the experimental group and the control group. This means that the use of interactive learning media based on digital storytelling has a positive influence on improving student learning outcomes in the Informatics subject at SMPN 5 Padang Panjang.

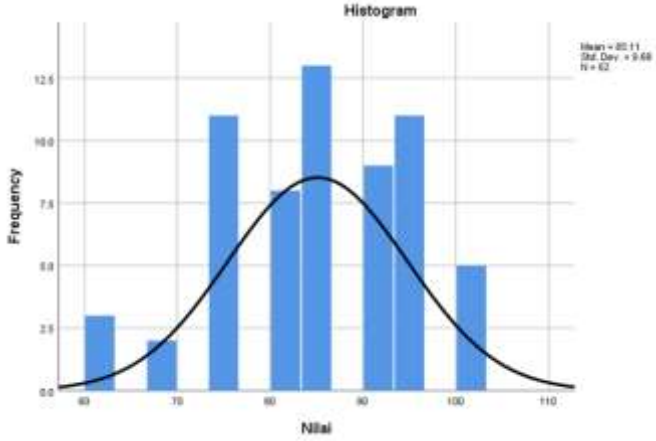

Figure 1. Data Analysis Curve

Based on the descriptive analysis results visualized through a histogram, the distribution of student scores shows a pattern close to a normal curve. This is evident from the data distribution centered in the 80–90 score range with a mean of 85.11 and a standard deviation (Std. Dev) of 9.68. The number of data analyzed is 62 students. The normal curve overlaid on the histogram shows that the research data is relatively normally distributed, thus the normality assumption is met.

DISCUSSION

This research was conducted to compare students' learning outcomes between the experimental class, which received treatment using interactive learning media with a digital storytelling approach, and the control class, which followed conventional learning. Learning outcomes are viewed as the final achievement of students after going through the learning process. The success of learning can be measured by the learning outcomes achieved, so in this research, learning outcomes were used as an indicator to assess the effectiveness of learning with two different treatments. Based on the research results in the Informatics subject at SMPN 5 Padang Panjang, data analysis and hypothesis testing showed that the research hypothesis was accepted. This means that variable X (interactive learning media with a digital storytelling approach) has a positive and significant influence on variable Y (students' learning outcomes).

The descriptive test results show that the posttest mean score for students in the experimental class was 87.94 with a standard deviation of 7.711, while in the control class it was 82.29 with a standard deviation of 10.706. This difference in means indicates that the experimental class had higher achievement compared to the control class. The normality test results show that the data from both groups had a significance value greater than 0.05, so they are normally distributed. For the homogeneity test, the Sig. value based on Mean was 0.103, which is greater than 0.05, so it can be concluded that the variances of the posttest data for the experimental class and the posttest data for the control class are equal or homogeneous. In the hypothesis test, the calculated value 5% ($\alpha = 0,05$) with degrees of freedom (dk) = ((n1 + n2) - 2 = (31 + 31) - 2 = 60), the value obtained (ttabel = 1,671). Because (thitung > ttabel) or (2,38 > 1,671). During the learning process using interactive learning media based on digital storytelling, students appeared very enthusiastic and eager to follow each stage of the activity. Students also seemed actively involved in the learning, both when listening to explanations, observing the digital story flow, and when completing exercises integrated with the interactive media.

The high student engagement in learning through digital storytelling media has a positive impact on improving students' understanding, particularly on the Computer Systems material. The results of this research align with several previous studies that prove the use of interactive learning media with a Digital Storytelling approach influences the improvement of students' learning outcomes. One of them is the research conducted by Yuliana & Putri (2021), which showed that the paired sample t-test resulted in a Sig. (2-tailed) value of $0.001 < 0.05$, meaning there is a significant difference between pretest and posttest results. In addition, the simple linear regression test results showed an R Square value of 0.142 or 14.2%, indicating that the use of Digital Storytelling has an influence on students' learning outcomes of 14.2%, while the rest is influenced by other factors outside the research.

Thus, learning that uses interactive learning media based on Digital Storytelling is proven to improve students' learning outcomes. Overall, this research shows that the implementation of Digital Storytelling learning media has a positive influence on learning outcomes in the Informatics subject at SMP Negeri 5 Padang Panjang, consistent with the findings of Yuliana and Putri in the Basic Graphic Design subject at SMKN 1 Kendit.

CONCLUSION

There is an influence of using interactive learning media with a digital storytelling approach on the Informatics learning outcomes of grade VIII students at SMPN 5 Padang Panjang. This is proven through the independent sample t-test results which obtained a value (t_count = 2.38). At a significance level of 5% ($\alpha = 0.05$) with degrees of freedom (df) = ((n1 + n2) - 2 = (31 + 31) - 2 = 60), the table value (t_table = 1.671) was obtained. Because (t_count > t_table) or (2.38 > 1.671), the alternative hypothesis (H1) is accepted. Thus, it can be concluded that the use of interactive digital storytelling media has a significant influence on student learning outcomes. The average learning outcomes of students in the experimental class treated with interactive learning media based on digital storytelling is 87.94, while the control class without treatment only reached an average of 82.29.

The difference in average of 5.65 points indicates that students in the experimental class have better learning outcome achievements compared to students in the control class.

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