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THE EFFECTIVENESS OF USING WORDWALLS TO IMPROVE STUDENTS' UNDERSTANDING OF INDONESIAN CULTURAL DIVERSITY MATERIAL

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ABSTRACT
This study aims to determine the effectiveness of interactive learning media Wordwall in improving the understanding of fifth grade students on the topic of "Cultural Diversity in Indonesia" at SDN Karanggeneng 1. This study uses a quantitative approach with a one group pretest-posttest design. A total of 15 students were selected through total sampling as research samples. Data collection was carried out using pretest and posttest instruments to measure students' cognitive understanding before and after the intervention. Data were analyzed using descriptive statistics and Paired Sample t-Test with SPSS 21. The results showed a significant increase in student scores, from a pretest average of 77.07 to a posttest average of 95.03. The results of the Paired Sample t-Test showed a Sig. (2-tailed) value of 0.000 <0.05 and a t-count value of 21.017> t-table 2.145, which means there is a statistically significant difference. In addition, the standard deviation decreased from 2.89 to 1.99 indicating more consistent and equitable learning outcomes. These findings suggest that Wordwall significantly enhances student learning and engagement through interactive quizzes, games, and puzzles. Wordwall supports a student-centered and visual learning style that resonates with learners who are familiar with digital technology. The study concluded that Wordwall is not only effective in enhancing learning outcomes but also fosters an engaging and active classroom atmosphere. This study contributes to the development of innovative learning strategies and suggests the widespread application of interactive digital media to enhance students' cultural understanding and appreciation of national diversity. Future research is recommended to explore other cognitive, affective, and psychomotor aspects with larger and more diverse samples.

I. INTRODUCTION

The use of technology in Indonesian education has experienced a significant spike since the COVID-19 pandemic hit in 2020 [1] . The pandemic forced the education system to rapidly transform towards online and hybrid learning, which also encouraged the adoption of various digital learning platforms by educators and students. In the 2020–2021 period, 24.55% of users started using Digital Learning Applications (APD), a drastic increase from before the pandemic which only recorded a figure of 9.82% [2] . This figure continues to increase until it peaks at 45.09% in 2022–2023. However, there was a decrease in adoption in 2024 to 20.54%, along with the stabilization of the face-to-face learning system in schools [3] . In an effort to support the digitalization of education, the government through the Ministry of Education and Culture has distributed more than 1.2 million Information and Communication Technology (ICT) devices to more than 71 thousand formal schools throughout Indonesia. In addition, the "Merdeka" program also supports the program. The Teaching Platform (PMM) launched as part of the Merdeka Curriculum recorded more than 4.3 million active users by 2024, with 52% of its users coming from rural areas. It was also recorded that more than 1.3 million teaching materials had been uploaded by teachers, reflecting the spirit of collaboration and creativity of educators in designing digital learning [3]–[5] .

The use of digital devices among students also shows a positive trend. Based on data from the National Socio-

Economic Survey (Susenas) in March 2023, as many as 83.41% of students aged 5–24 years have used mobile phones to support learning activities, while 19.27% use computers [6] . Although there is still a gap between urban and rural areas, with internet usage of 82.22% in cities and 70.56% in villages, this data shows significant progress in access to technology. [7] . However, the main challenge is still faced in terms of the readiness of human resources, especially teachers. Until 2021, as many as 60% of teachers in Indonesia were declared to not have adequate digital competence. Although in 2023 the number of teachers with digital competence will increase to around 30.36% of the total 3.36 million teachers in Indonesia, this figure still shows the need for training and capacity building in optimal use of technology [8] .

Although the use of digital devices such as mobile phones by students has reached 83.41%, and internet access has reached more than 70% of rural areas, in reality there are still many teachers and students who have not maximized technology as a means of interactive and fun learning [9], [10]. In this context, the use of interactive, game-based, and easily accessible digital media, such as Wordwall, is a strategic solution. Wordwall is a game-based learning platform that allows teachers to create quizzes, puzzles, and classification activities that can be adapted to various teaching materials [11]. The use of Wordwall not only increases student engagement, but also encourages understanding of concepts in a more fun and participatory way [12].

However, to strengthen Wordwall's position as an effective learning medium, it is important to compare it with similar platforms such as Kahoot and Quizizz. Unlike Wordwall, which emphasizes classification activities and printable interactive games, Kahoot and Quizizz tend to focus on speed-based quizzes and competitions [9] . In the context of cultural learning, Wordwall offers visual flexibility and print functions that are more appropriate for exploring narrative or symbolic visual content, such as cultural symbols, customs, and social structures. The use of Wordwall also needs to be seen in terms of its contribution to changes in the pedagogical approach in the Independent Curriculum, which emphasizes differentiated, project-based, and learner-centered learning. Wordwall supports this approach through the ease of adapting materials to students' needs and abilities, as well as its ability to be used in project-based activities, such as creating regional cultural quizzes that are done collaboratively [10]–[12] . Thus, Wordwall is not only an auxiliary medium, but also part of a pedagogical strategy that supports the spirit of the Independent Curriculum.

In the early stages of its adoption (2020–2021), Wordwall began to be introduced as an alternative digital teaching media. Research conducted by Fathia et al., showed that the use of Wordwall in grade 1 mathematics learning succeeded in increasing student learning completion by 88.04% [13] . Likewise, research by Hadi et al., the application of Wordwall in social studies learning resulted in an average student score of 79.99 and a completion rate of 94.83% [14] . These findings indicate that Wordwall has great potential to improve conceptual understanding through a visual and interactive approach. Entering 2022–2023, the adoption of Wordwall is increasingly widespread, supported by training programs held in various regions. In Parigi Regency, Central Sulawesi, training for elementary school teachers improved their ability to integrate Wordwall into the learning process. Another study at SDN 28/IV Jambi City showed a significant increase in student activity in learning Indonesian, from 64.5% to 88% after routine use of Wordwall [15] .

The 2024–2025 period marks a broader and more diverse integration of Wordwall across levels and subjects. Research by Hidayaty et al., in utilizing Wordwall by organizing teacher training encourages the creation of a creative learning model that utilizes Wordwall as a teaching medium [16] . Even at the elementary school level, Wordwall has been utilized in gamification-based learning, which has received a positive response from teachers and students [17] . From a series of studies and reports, it can be concluded that Wordwall has proven effective in improving student learning outcomes, participation, and motivation. In addition, this platform is flexible and can be used for various subjects, including the material on Indonesian Cultural Diversity which requires a visual and participatory approach so that students can more easily understand the nation's cultural richness. This material is important to be instilled from an early age because it reflects the identity of a multicultural nation and teaches the values of tolerance. However, based on observations in the field, many students still have difficulty understanding the richness of Nusantara culture as a whole because the learning methods are conventional and less interesting.

The phenomenon of low student interest and participation in the material on Indonesian cultural diversity is also seen in grade V students of SDN Karanggeneng 1. At the beginning of learning, this material is less able to attract students' attention optimally. They tend to be passive during the learning process, and only a small portion can relate the cultural information learned to real life. This shows a gap between the contextual and multicultural objectives of social studies learning and the learning approach that is still conventional and less participatory. In this context, the urgency of research lies in the need for innovation in learning media that can stimulate student activity while strengthening their understanding of the values of national diversity. Responding to this challenge,

teachers at SDN Karanggeneng 1 began using interactive learning media Wordwall, which presents educational games such as matching pairs, group sort, and quiz shows with Nusantara cultural content, including traditional clothing, traditional houses, traditional dances, and regional songs from various regions in Indonesia.

The effectiveness of Wordwall media has been proven in several previous studies. Pramudita et al., through classroom action research at SDN 2 Pelemkerep showed an increase in student understanding from an average of 61.6% in cycle I to 76.60% in cycle II, as well as an increase in student learning activities to reach 80.98% [18] . Ginting & Sitepu's research also strengthened this through a quasi-experiment on 50 fifth grade students, which showed a significant difference between the experimental group (Wordwall) and the control group (lecture), with a significance value of 0.01 (<0.05) [19] . Furthermore, Wahyudi & Suryani developed an educational game based on Wordwall which was declared very valid (91.3%) and very practical (92%) based on expert assessments and user responses [20] .

Based on these findings, this study aims to test the effectiveness of using Wordwall media in improving students' understanding of the material on Indonesian cultural diversity. With a contextual and interactive technology-based approach, it is expected that students will not only understand the concept of cultural diversity cognitively, but also be able to internalize and internalize the values of national diversity affectively and socially. However, the novelty of this study lies in its specific contextual focus on SDN Karanggeneng 1 with unique local characteristics of students, as well as the use of Wordwall not only as a visual aid, but also as an instrument to internalize the values of cultural diversity interactively and collaboratively. This study not only measures the increase in students' cognitive understanding, but also explores how Wordwall can build an appreciative attitude towards local and national cultures. Thus, this study contributes to the development of an adaptive social studies learning model to technology and the character needs of elementary school students in the digital era.

II. RESEARCH METHODS

This study uses a quantitative approach with a quasi-experimental design that aims to determine the effectiveness of using Wordwall media on students' understanding of the material on Indonesian cultural diversity [21], [22] . The design used is One Group Pretest-Posttest Design, which is a research design involving one group of subjects without a control group [23] . In this design, the group of subjects is given a pretest first to measure students' initial understanding of the material, then given treatment in the form of learning using Wordwall media, and ends with a posttest to determine the increase in understanding after being given treatment. One Group Pretest-Posttest Research Design:

TABLE 1
RESEARCH DESIGN CONCEPT

Pre-exam	Action/Treatment	Post-exam
O1	X	O2

Source: Sugiyono [18]

Information:
O1 = Pretest Score (before treatment is given)
X = Treatment in the form of using Wordwall media
O2 = Posttest Score (after treatment is given)

The test result data is then analyzed and processed to see the extent of the effect of the treatment represented by the O2 value. If there is a significant difference between the pretest and posttest results, it can be concluded that the use of Wordwall learning media has a positive effect on improving student understanding.

A. Population and Research Sample

The population in this study were all fifth grade students of SDN Karanggeneng. The sampling technique used was purposive sampling, which is a method of determining samples based on certain considerations or criteria that are relevant to the purpose of the study. In this context, the fifth grade consisting of 15 students was used as a research sample because they had studied the material on Indonesian Cultural Diversity which was the main focus of this study. The total sampling method was applied because the number of students in the population was relatively small and all members of the population met the criteria as subjects who were eligible to be tested. Thus, all fifth grade students of SDN Karanggeneng were involved as research samples to obtain more representative and in-depth results regarding the effectiveness of using Wordwall media in improving understanding of cultural diversity material.

B. Data collection technique

The data collection technique in this study used a test method, consisting of a pre-test and a post-test. The main purpose of implementing these two tests is to measure changes or improvements in students' understanding before and after being given treatment, namely learning using Wordwall media on the material of Indonesian Cultural Diversity. The pre-test was conducted before the application of Wordwall media, with the aim of determining the level of students' initial understanding of the material. This test provides an overview of the extent to which students have understood the learning content that will be studied without any digital learning media intervention. While the post-test was conducted after the learning process using Wordwall was completed. This test aims to assess the increase in students' understanding after gaining learning experience through interactive media. Both tests are arranged in the form of multiple-choice questions that refer to the competency achievement indicators (IPK) of the material on Indonesian cultural diversity. The test instrument has been validated in advance by a material expert to ensure that the questions given are relevant, valid, and reliable in measuring students' cognitive abilities in accordance with the research objectives. By using this pre-test and post-test technique, researchers can compare student learning outcomes before and after treatment and assess the effectiveness of using Wordwall media in improving students' understanding of the learning material.

TABLE 2
OUTLINE OF PRE-TEST AND POST-TEST INSTRUMENTS

NO.	Basic Competencies (SK)	Question Indicator	Material	Inquiry Form	Cognitive Level
1	3.3 Identifying the diversity of ethnicities and cultures in Indonesia	Students can mention examples of ethnic groups in Indonesia.	Diversity of ethnic groups	Multiple choice	C1 (Remember)
2	3.3 Identifying the diversity of ethnicities and cultures in Indonesia	Students can identify traditional clothing from various regions	Traditional clothes	Multiple choice	C2 (Understand)
3	3.3 Identifying the diversity of ethnicities and cultures in Indonesia	Students can match traditional houses with their home areas.	Custom home	Multiple choice	C3 (Implementation)
4	3.3 Identifying the diversity of ethnicities and cultures in Indonesia	Students can recognize regional dances based on their names and origins.	Traditional dances	Multiple choice	C2 (Understand)
5	3.3 Identifying the diversity of ethnicities and cultures in Indonesia	Students can explain the importance of tolerance in cultural diversity.	The value of tolerance in culture	Multiple choice	C4 (Analysis)

C. Data Analysis Techniques

Data processing in this study was carried out using the IBM SPSS (Statistical Package for the Social Sciences) version 21 application. This tool was chosen because it has reliable, accurate, and efficient statistical capabilities for processing quantitative data, especially in analyzing pre-test and post-test data in the One Group Pretest-Posttest Design experimental design. The following are the stages of data analysis techniques used:

1. Descriptive Statistics

Descriptive statistics are used to determine the mean, maximum, minimum, and standard deviation of the pre-test and post-test results. These data provide an initial picture of how much student understanding has improved.

2. Normality Test (Shapiro- Wilk)

The normality test aims to determine whether the data is normally distributed. The test is carried out using the Shapiro-Wilk Test via SPSS, with the following interpretation provisions:

- If the significance value (Sig.) > 0.05 then the data is normally distributed.
- If the significance value (Sig.) < 0.05 then the data is not normally distributed.

If the data is normally distributed, then the analysis continues with a paired t-test (Paired Sample t-Test).

3. Paired Sample t-Test

This test is used to determine the significant difference between the pre-test and post-test values after being given treatment. The conceptual t-test formula is as follows:

$$t = \frac{\bar{X}_d}{S_d/\sqrt{n}}$$

By title:

$\bar{X}_d$= Average difference between post-test score and pre-test score

S $_d$ = Standard deviation of the difference

n = Number of samples

Interpretation of the t-test results in SPSS is done by paying attention to the Sig. value (2-tailed):

- If Sig. (2-tailed) < 0.05 then there is a significant difference, meaning that the Wordwall media has a

positive effect on increasing student understanding.

- If Sig. (2-tailed) ≥ 0.05 then there is no significant difference, meaning that the Wordwall media does not have a real influence on increasing student understanding.

III. RESULTS AND DISCUSSION

This study aims to determine the effectiveness of Wordwall learning media in improving the understanding of fifth grade students of SDN Karanggeneng 1 on the material of Indonesian Cultural Diversity. Data were obtained through pre-test (before treatment) and post-test (after treatment), then analyzed quantitatively using the IBM SPSS 21 program.

A. Descriptive Statistical Test

Descriptives

			Statistic	Std. Error
pretest	Mean		77.0667	.74621
	95% Confidence Interval for Mean	Lower Bound	75.4662	
		Upper Bound	78.6671	
	5% Trimmed Mean		76.9074	
	Median		77.0000	
	Variance		8.352	
	Std. Deviation		2.89005	
	Minimum		73.00	
	Maximum		84.00	
	Range		11.00	
	Interquartile Range		4.00	
	Skewness		.497	.580
	Kurtosis		1.264	1.121

Figure 1Results of Descriptive Analysis of Pretest

Based on the results of the descriptive analysis in Figure 1, using IBM SPSS, a picture of student understanding before treatment was obtained. The average pre-test score of students was 77.07, with a standard error of 0.74621, indicating that student understanding was quite good. The 95% confidence interval for the mean ranged from 75.47 to 78.67, indicating that the population mean was within that range. The median pre-test score was also 77, indicating a symmetrical data distribution, while the standard deviation of 2.89 indicated a consistent distribution of values. The minimum score of 73 and the maximum of 84, with a range of 11 points, indicated moderate variation in student achievement. Skewness of 0.497 indicated a slightly skewed distribution to the right, but still normal, and kurtosis of 1.264 indicated a higher peak distribution than normal, but still reasonable.

Descriptives

			Statistic	Std. Error
posttest	Mean		95.0267	.51441
	95% Confidence Interval for Mean	Lower Bound	93.9234	
		Upper Bound	96.1300	
	5% Trimmed Mean		95.0463	
	Median		95.1000	
	Variance		3.969	
	Std. Deviation		1.99229	
	Minimum		91.50	
	Maximum		98.20	
	Range		6.70	
	Interquartile Range		3.20	
	Skewness		-.180	.580
	Kurtosis		-.805	1.121

Figure 2Posttest Descriptive Analysis Results

After using the Wordwall learning media on the Indonesian Cultural Diversity material, the results of the descriptive analysis can be seen in Figure 2, which shows that the post-test score showed a significant increase. The average post-test score reached 95.03 with a standard error of 0.51441, which shows that students'

understanding has increased. The 95% confidence interval for the mean ranges from 93.92 to 96.13, which shows high confidence in the results. The median score is 95.10, which shows a symmetrical data distribution. The standard deviation decreased to 1.99, which shows a more even distribution of scores. The minimum score of 91.50 and the maximum score of 98.20 produced a range of 6.70, which shows that all students scored high. Skewness of -0.180 and kurtosis of -0.805 indicate a normal and fair distribution. Overall, the post-test results showed a significant increase from an average of 77.07 in the pre-test to 95.03, indicating that the Wordwall media was effective in improving students' understanding and consistency of learning outcomes.

B. Normality Test

The normality test was conducted to determine whether the pre-test and post-test data were normally distributed. Given that the number of samples was only 15 respondents, the appropriate normality test to use was Shapiro-Wilk.

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
pretest	.185	15	.177	.907	15	.121

a. Lilliefors Significance Correction

Figure 3Pre-Test Normality Test Results

Based on Figure 3 above, the results show that the significance value (Sig.) in the Shapiro-Wilk test of 0.121 indicates that the pretest data is normally distributed. Because this value is greater than 0.05, this indicates that there is no significant deviation from the normal distribution. Thus, the pretest data can be analyzed using parametric statistical tests, provided that other requirements are also met. In conclusion, the pretest data meets the normality assumptions needed for further analysis. These results are supported by the distribution of data in this study which tends to follow a normal distribution pattern. These results can be seen in Figure 4 below:

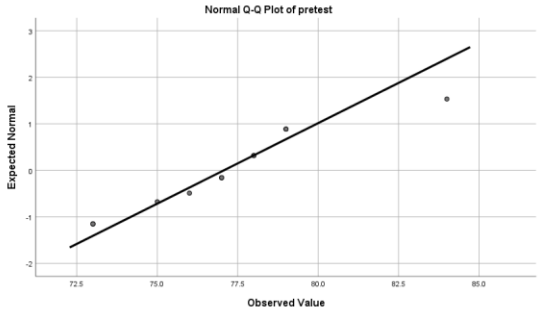

Figure 4QQ Pretest Norms

Based on Figure 4 above, it shows the Normal QQ Plot for the pretest data. In this plot, the horizontal axis (x) represents the observed values, while the vertical axis (y) shows the expected normal values. The black line that appears slanted from the lower left corner to the upper right corner is the reference line indicating a normal distribution. From this figure, it can be seen that the pretest data tends to follow a normal distribution pattern, which is consistent with the previous Shapiro-Wilk test results. This confirms that the data is worthy of being analyzed using parametric statistical methods.

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
posttest	.072	15	.200*	.980	15	.969

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

a. Lilliefors Significance Correction

Figure 5Posttest Normality Test Results

Based on Figure 5 above, it is obtained that from the SPSS output results, the significance value (Sig.) For the Shapiro-Wilk test is 0.969 which means it is greater than 0.05. Because this significance value exceeds 0.05, it can be concluded that the posttest data is normally distributed. This means that the posttest data does not show significant deviations from the normal distribution. This means that the data meets one of the basic assumptions of

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using parametric statistical tests, so that further analysis can be carried out with the right method. And for the distribution of data in this study, it is still classified as normal because the data is distributed following a normal distribution pattern.

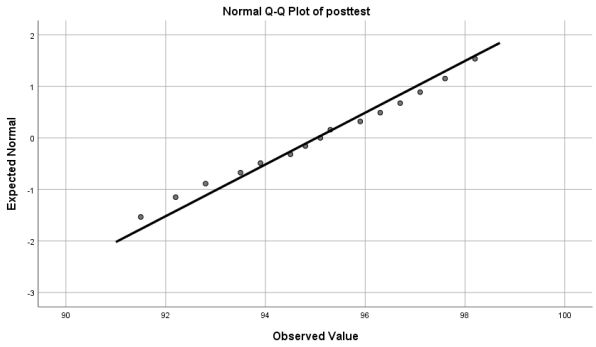

Figure 6Posttest Normal QQ Plot

Based on the results of the normality test shown in Figure 6 above, it shows that the pretest and posttest data obtained both showed normal significance values. For the pretest data, the significance value in the Shapiro-Wilk test of 0.121 is greater than 0.05, indicating that the pretest data is normally distributed. Likewise, for the posttest data, the significance value of 0.969 is greater than 0.05, indicating that the posttest data is also normally distributed. Thus, it can be concluded that the pretest and posttest data show a normal distribution. The distribution of both data still follows the normal path distribution pattern which allows the use of parametric statistical analysis methods. The next step is to proceed to Test C, namely the Paired Sample t-Test. This test will be used to compare the means of two related groups, in this case between the pretest and posttest data. The results of this test will provide a further picture of the effectiveness of the intervention carried out.

C. *Paired Sample t-Test*

Paired Sample t-Test was conducted in this study to determine whether there was a significant difference between the pretest and posttest scores after being given treatment. The results of the Paired Sample t-Test in this study can be seen in the image below:

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	pretest - posttest	-17.96000	3.30968	.85456	-19.79284	-16.12716	-21.017	14	.000

Figure 7Paired Sample T-Test

Based on the analysis results in Figure 7 above, the p-value (Sig. 2-tailed) of 0.000 is smaller than $\alpha = 0.05$. This means that H_0 is rejected, indicating a significant difference between the pretest and posttest results. In addition, the |t count| value of 21.017 is greater than the t table of 2.145 (with df = 14 and $\alpha / 2 = 0.025$) again rejects H_0 and strengthens the conclusion that the difference is statistically significant. The average difference between the pretest and posttest is -17.960, indicating that the posttest value is higher than the pretest. In conclusion, there is a significant influence between before and after treatment. A higher posttest value indicates that the treatment is effective in improving the measurement results, so it can be said to have a positive influence on the variables studied.

The implementation of learning using Wordwall in improving students' understanding of the material on Indonesian cultural diversity in this study went well and so did the results of its implementation, the Wordwall method was proven to be able to improve children's understanding of the material on Indonesian cultural diversity. This is reflected in the results of the pre-test and post-test which experienced a significant difference in improvement.

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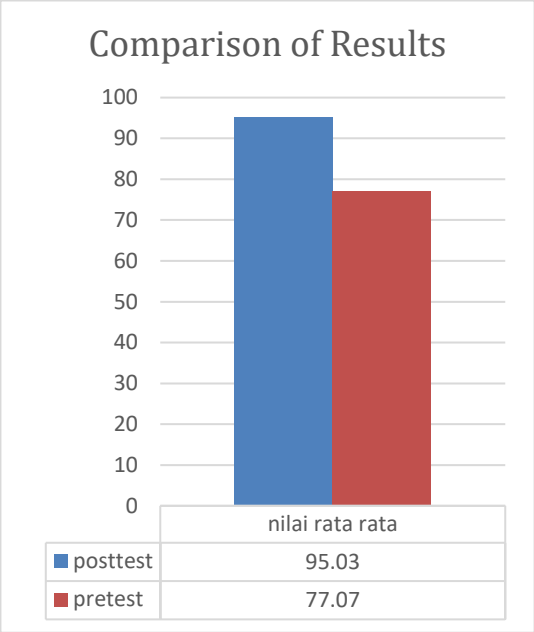

Figure 8. Chart 1Comparison of Results

The comparison of the pre-test and post-test results shown in Graph 1 above and reinforced by the results of *the Paired Samples Test* shows that there is a significant change in student understanding after the application of the Wordwall learning media. The average pre-test score of students of 77.07 experienced a fairly sharp increase to 95.03 in the post-test. This increase illustrates that the use of Wordwall is able to provide a positive impact on improving students' understanding of the material on Indonesian Cultural Diversity. The decrease in standard deviation from 2.89 in the pre-test to 1.99 in the post-test shows that the increase in student scores is more even and consistent. This indicates a tendency for equalization of learning outcomes among students. This decrease in standard deviation can be interpreted as a reduction in the gap in understanding between individuals, which means that not only students with high abilities experience improvement, but also students with medium and low abilities show similar progress. Thus, Wordwall not only improves the average learning outcomes, but also helps create a more homogeneous distribution of learning outcomes. However, the decrease in standard deviation also needs to be interpreted carefully because it could be influenced by other factors, such as the uniform level of difficulty of the post-test questions or the tendency of students to share information with each other during the test. Therefore, the consistency of the increase needs to be further examined in the context of implementation and control during the evaluation. The results of *the Paired Samples Test* also showed results that were statistically very significant. The significance value (*Sig. 2-tailed*) of 0.000 <α = 0.05, and the *calculated t value* of 21.017> *t table* 2.145, confirm that there is a real difference between the results before and after the treatment. Thus, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is accepted, which states that there is a significant effect of the use of Wordwall on improving student understanding.

Pedagogically, the results of this study reflect the success of using Wordwall media in creating an interactive and enjoyable learning experience. Wordwall allows students to be actively involved in the learning process through various activities such as quizzes, puzzles, and educational games that are directly related to the subject matter. This approach is very much in line with the characteristics of today's students who are more interested in digital and visual-based learning. The results of this study confirm that the use of Wordwall not only contributes to improving student learning outcomes, but also builds a more lively and conducive classroom atmosphere for meaningful learning. Therefore, interactive learning media such as Wordwall are highly recommended as an innovative strategy in delivering learning materials, especially materials such as "Indonesian Cultural Diversity" which require in-depth understanding and active participation from students.

This finding is in line with previous research conducted by Herta et al. which showed that the use of Wordwall in learning has a positive impact on student activities and learning outcomes. In their research, the average value of student observations increased from 59% in cycle I to 89% in cycle II, while test scores increased from 81 to 96.

This proves that Wordwall media is effective in improving elementary school students' reading and comprehension skills significantly [24] .

In addition, research by Waluyo et al. (2024) also supports these findings. They stated that Wordwall had an average validation score of 94% and was included in the "very feasible" category. The paired t-test between pretest and posttest showed a significant increase in student performance, while student responses showed high satisfaction with the interactive features of Wordwall. The study confirmed that Wordwall is a practical, interesting, and effective medium for delivering complex learning content to the digital native generation. [14] . Furthermore, research by Nadia & Desyandri also showed that the development of Wordwall-based educational media for social studies subjects at SMP Negeri 1 Pamekasan with the 4D development model was declared very feasible, with a media feasibility score of 4.4 and material feasibility of 4.81 [25] . This strengthens the evidence that Wordwall can be an effective learning solution, feasible to develop, and has a direct impact on the quality of learning. Referring to these results, this study not only adds empirical evidence regarding the effectiveness of Wordwall, but also strengthens Wordwall's position as a learning medium that is worthy of being integrated into the educational process, especially in the context of improving learning outcomes and active student involvement.

Based on the results of the research that has been conducted, it can be concluded that the use of Wordwall media in the learning process has a positive influence on improving student learning outcomes, especially in the material on Indonesian Cultural Diversity. This media is able to create a more interactive, enjoyable learning atmosphere, and in accordance with the characteristics of the current digital generation. Wordwall not only improves students' cognitive values, but also builds interest and active involvement in the learning process. In addition, this finding is supported by previous research which shows that Wordwall is a feasible, practical, and effective learning media in improving students' understanding and motivation to learn. In implementing this research, there are several limitations that need to be considered. First, the scope of the research subjects is still limited, because it was only carried out in one class at the elementary school level. This condition causes the results obtained to not be able to be generalized widely to the student population with different characteristics, both from levels and other school environments.

Second, the relatively short duration of handling and only focused on one learning theme, namely Indonesian Cultural Diversity, means that the results of this study cannot comprehensively describe the long-term impact of using Wordwall media on the learning process in general. This opens up opportunities for further research with a more varied time span and themes. Third, this study only focuses on improving students' cognitive learning outcomes, while the affective (attitude, motivation) and psychomotor (skills) aspects have not been measured specifically. In fact, in the context of holistic learning, these three aspects are closely related and equally important to be studied simultaneously. Fourth, the use of Wordwall media depends on technological infrastructure, such as internet networks and digital devices (laptops, tablets, or smartphones). This is a challenge, especially for schools that do not yet have adequate technological facilities, thus hindering the optimal application of media in all learning contexts. Therefore, it is recommended to conduct further research with a wider population coverage, longer time, and involving various other learning aspects. Thus, the effectiveness of Wordwall media can be evaluated more comprehensively and in-depth, while providing a stronger contribution to the development of innovative learning strategies in the future.

However, in the implementation of this research there are several obstacles and limitations that need to be considered. First, the limited scope of research subjects, which only involved one class at the elementary school level, makes these findings unable to be generalized to student populations with different backgrounds and levels of education. Second, the relatively short duration of implementation and focus on only one learning theme limits the scope of analysis of the long-term impact of using Wordwall in broader and more sustainable learning. Third, this study emphasizes cognitive learning outcomes, while affective aspects such as motivation, attitude, and psychomotor aspects have not been the main focus, even though all three have complementary roles in comprehensive learning. Fourth, Wordwall's dependence on technological infrastructure such as a stable internet network and the availability of digital devices is a challenge in itself, especially for schools that do not yet have adequate facilities and infrastructure. This limitation has the potential to hinder the optimal implementation of Wordwall in various school contexts, especially in areas with limited access to technology. Therefore, it is recommended that further research be conducted with a wider population coverage, a longer period of time, and covering various learning themes and dimensions of learning outcomes. With this approach, the effectiveness of Wordwall media can be evaluated more comprehensively and in-depth, and provide a stronger contribution to the development of innovative and inclusive digital learning strategies in the future.

IV. CONCLUSION

Based on the results of the research and data analysis that have been carried out, it can be concluded that the use of interactive learning media Wordwall has proven to have a significant effect on improving students' understanding of the material on Indonesian Cultural Diversity. The results of the Paired Sample t-Test showed a significance value (Sig. 2-tailed) of 0.000, which is smaller than $\alpha = 0.05$ and a calculated t value of 21.017, which is greater than the t table of 2.145. Thus, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is accepted, which means that there is a significant difference between the results of the pre-test and post-test of students after being treated using Wordwall. The increase in the average value from 77.07 (pre-test) to 95.03 (post-test) reflects that Wordwall is effective in improving students' understanding. In addition, the decrease in the standard deviation from 2.89 to 1.99 shows that the increase occurred more evenly and consistently in all students, not only in a small number of students. Overall, the results of this study reinforce that the use of Wordwall as an interactive learning media is able to create a more interesting, enjoyable learning atmosphere and have a positive impact on student understanding. Therefore, this media is highly recommended to be applied in the learning process in elementary schools, especially in materials that require active participation and deep understanding.

V. REFERENCE

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