



The Influence of Wordwall Learning Media and Learning Interest on Learning Outcomes

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Abstract: Technology integration into teaching has become increasingly important in modern education, especially in improving student engagement and achievement. This research explores the effect of Wordwall-based learning media on ninth-grade student learning outcomes in the Indonesian language at MA Laboratory UIN SU Medan. While previous studies have shown the advantages of digital learning tools, there is still limited understanding of their specific influence on learning interest and performance in various educational settings. This quantitative quasi-experimental study fills this gap by examining how Wordwall media and students' learning interests influence academic achievement. Data were gathered through pretests and posttests and then analyzed using statistical methods to assess significance. The results show that Wordwall usage significantly boosts student outcomes, with a clear difference between the experimental and control groups ($F_{\text{calculated}} = 30.855$, $p < 0.05$). Additionally, students with higher learning interests performed better, and a positive interaction was found between Wordwall usage and learning interest ($F_{\text{calculated}} = 4.629$, $p < 0.05$). These findings indicate that Wordwall enhances student learning interests and learning outcomes, making it a valuable learning media for educators seeking to improve learning outcomes.

Keywords: learning interest; learning media; learning outcomes; wordwall

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INTRODUCTION

In the rapidly evolving 21st-century education, teachers are increasingly expected to transition from traditional roles to becoming facilitators of learning. This transition demands that educators employ a variety of learning media effectively to cater to the diverse needs of students (Pittman et al., 2022; Tywoniw, 2023). As facilitators, teachers are responsible for providing appropriate learning environments and materials that foster engaging and enjoyable learning experiences (Septriani & Rustandi, 2023; Terrón-López et al., 2020). Technology integration into teaching practices has been identified as a critical factor in enhancing the learning experience, allowing for the creation of innovative and interactive educational tools that stimulate learning interest and participation (Almgren & Hjelm, 2021; Elhefni et al., 2023). Specifically, using digital learning media such as Wordwall has been highlighted as an effective means of creating dynamic and interactive learning environments that can significantly improve student outcomes (Gupta & Shivers-McNair, 2024; Hartutik & Aprilia, 2024). Given the essential role of technology in modern education (Amal & Isnaini, 2023; Mesran et al., 2024), it is crucial to explore how digital tools like Wordwall can enhance learning experiences and outcomes (Jimmy et al., 2024), particularly in subjects like Indonesian language instruction.

Previous studies have extensively explored the influence of various learning media on student outcomes (Naik et al., 2020). Integrating technology in the classroom has positively influenced student engagement, motivation, and achievement (Chiu, 2021; Ibáñez et al., 2020; Yilmaz, 2021). For instance, gamification in education, incorporating game-like elements into learning activities, has been identified as a powerful tool for increasing student motivation and participation (Christopoulos & Mystakidis, 2023; Ofosu-Ampong, 2020; Oliveira et al., 2023). Wordwall, as a digital gamification application (Rahmasari et al., 2022), offers a variety of interactive features that can be tailored to meet specific educational needs, making it a versatile tool for teachers (Pimpuang & Yuttapongtada, 2023; Rodriguez-Escobar et al., 2023). Moreover, studies have demonstrated that interactive learning media can improve cognitive outcomes by making abstract concepts more tangible and accessible to students (Saarinen et al., 2021; Wahyuni, 2019; Wei et al., 2021). Despite the growing research on the benefits of digital learning media, there remains a need for more focused studies on specific media like Wordwall, particularly in language education, to better understand their effectiveness in improving student learning outcomes.

While the existing literature provides substantial evidence of the benefits of digital learning media, more research needs to be conducted specifically to address the use of Wordwall in Indonesian language learning

(Anindyawati, 2024; Putri & Fajrie, 2023; Rodriguez-Escobar et al., 2023). Most studies have focused on general subjects or STEM fields, leaving a significant area of inquiry to be explored (Sirakaya & Sirakaya, 2022). Furthermore, the influence of student learning interest as an internal factor influencing learning outcomes has yet to be thoroughly examined when using interactive media like Wordwall (Afifah & Indriwardhani, 2023; Fidian, 2023; Sulaikho et al., 2023). This gap highlights the need for empirical studies investigating the combined effects of digital learning tools and learning interest on learning outcomes in language subjects. By addressing these gaps, the present study aims to contribute to the broader understanding of how technology and student engagement can be leveraged to enhance educational outcomes in language instruction.

The rationale for this study is grounded in the urgent need to enhance the quality of education through the effective use of technology (Hidayatullah et al., 2024; Mahboubi, 2021). As educational standards continue to evolve, there is an increasing demand for innovative teaching methods that can cater to the diverse learning needs of students. This study seeks to explore the potential of Wordwall (Hasram et al., 2021) as a tool for improving student learning outcomes in Indonesian language classes by creating an engaging and interactive learning environment. The importance of this research lies in its potential to provide actionable insights for educators on how to integrate digital learning media into their teaching practices effectively, thereby addressing the ongoing challenge of improving student performance. By examining the relationship between the use of Wordwall and learning interest (Moorhouse & Kohnke, 2024; Nenohai et al., 2022; Savira & Gunawan, 2022), this study offers a comprehensive understanding of how these factors can be harnessed to improve educational outcomes, particularly in under-researched areas like language instruction.

This study investigates the influence of Wordwall learning media and learning interest on learning outcomes in Indonesian language learning. The primary research question is: How does Wordwall learning media influence learning outcomes in Indonesian language classes, and what role does learning interest play in this relationship? The study hypothesizes that (1) the use of Wordwall will have a positive effect on student learning outcomes, and (2) learning interest will mediate the relationship between the use of Wordwall and learning outcomes. These hypotheses will be tested through a mixed-methods approach, combining quantitative data on student performance with qualitative insights into student engagement and interest. The findings of this study are expected to provide valuable contributions to educational technology and language instruction, offering practical recommendations for educators seeking to enhance student learning outcomes through integrating digital media.

METHODS

This study examines the influence of Wordwall learning media on student learning interests and their subsequent learning outcomes (Pratiwi et al., 2024). The choice to explore this issue stems from the growing importance of educational technology in enhancing student engagement and performance, particularly in language learning (Lai & Bower, 2020; Mishra & Koehler, 2021; Purnamasari et al., 2022). The research employs a quantitative approach, utilizing a quasi-experimental design to compare the effects of the Wordwall intervention between an experimental group and a control group (Huang et al., 2020; Kumar et al., 2023). This approach is chosen to establish a causal relationship between using Wordwall. It changes student outcomes, with data collected through pretests and posttests to measure the effectiveness of the intervention (Subita et al., 2022). Quasi-experimental designs are beneficial in educational research as they allow for examining interventions in real-world settings while maintaining a degree of control over variables (Bryman, 2019; Cohen et al., 2021). The research was conducted at MA Laboratory UIN SU Medan, with the population consisting of all ninth-grade students across four different courses: XI MIA 1, XI MIA 2, XI IIS, and XI IIK.

Table 1. The Number of Ninth-grade Students

Class	Population
XI MIA 1	37
XI MIA 2	35
XI IIS	38
XI IIK	43

The sampling method used was random sampling, which ensured that each student in the population had an equal chance of being selected for the study, thus enhancing the generalizability of the findings (Sugiyono, 2018; Creswell & Creswell, 2017). Random sampling is particularly effective in reducing selection bias, making it a preferred technique in educational studies where diverse student characteristics must be represented (Etikan, 2016). The total sample size was determined based on the population of each class, with students being assigned to either the experimental group or the control group based on random assignment (Liu et al., 2023; Cohen, 2018). Data were collected using a Likert scale questionnaire designed to measure

student learning interest, which was further categorized into indicators such as excitement, learning interest, attention, and involvement (Rahman & Sumardi, 2021; Likert, 1932; Tavakol & Dennick, 2011).

Table 2. Scoring Guidelines

Answer choices	Scores
Always	5
Often	4
Sometimes	3
Seldom	2
Never	1

Table 3. Questionnaire Layout

Variable	Variable Indicator
Learning Interest (X ₂)	Excitement
	Learning interest
	Attention
	Involvement

The Likert scale is widely used in educational research because it captures the intensity of students' attitudes and perceptions (Joshi et al., 2015; Boone & Boone, 2012). The data analysis process began with a classical assumption test to ensure that the data met the necessary assumptions for further statistical analysis (Field, 2018; Tabachnick & Fidell, 2019), followed by normality and homogeneity tests to confirm the data's suitability for hypothesis testing (Pallant, 2020; Laerd Statistics, 2020). The final stage involved hypothesis testing to determine the presence of significant interactions between using Wordwall, learning interest, and student outcomes, employing statistical methods appropriate for quasi-experimental designs (Creswell & Creswell, 2018; Shadish et al., 2002).

RESULT AND DISCUSSION

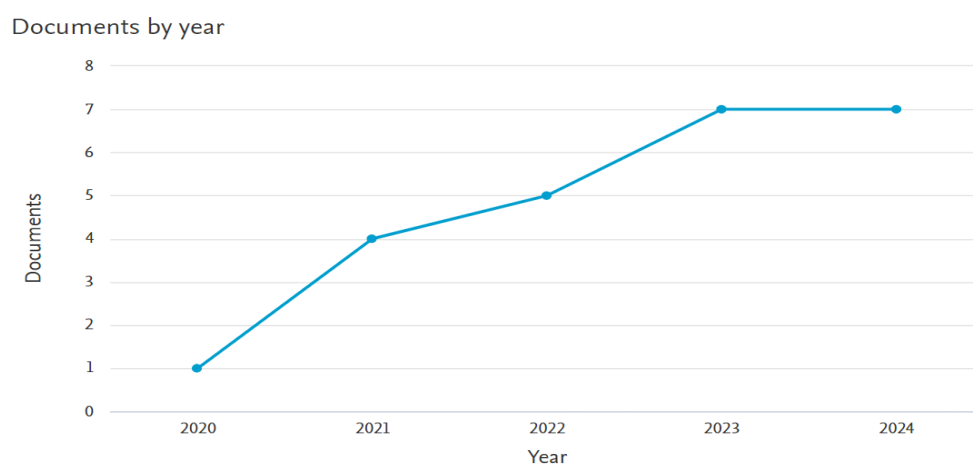


Figure 1. Visualization of Wordwall Learning Media from 2020-2024

Figure 1 shows that research about learning media using Wordwall published in Scopus-indexed journals is still limited. On the other hand, Indonesian researchers have widely published research about learning media using Wordwall in Sinta-indexed journals. The purpose of displaying this Scopus data is to highlight the research gap regarding the use of Wordwall as a learning media, particularly in the context of Scopus-indexed journals. It demonstrates that while Indonesian researchers have a substantial interest in and publication activity in Sinta-indexed journals, they are limited in representation in higher-impact, internationally recognized platforms. This can underline the need for more rigorous, globally visible research in this area to establish its academic validity and enhance its adoption in diverse educational settings.

In this study, the experimental and control classes were given a pretest first to see whether the samples in the study were normally distributed, homogeneous, and had the same initial abilities. Similarities are needed so that when the two classes are given different treatments, differences in learning outcomes will be obtained. Table 4 presents pretest data from the experimental class and control class.

Table 4. Pretest Results in Experiment and Control Classes

Experiment Class			Control Class		
Interval	F	F Relative (%)	Interval	F	F Relative (%)
20-35	5	13	30-38	5	14
36-47	3	8	39-46	9	24
48-59	10	26	47-55	6	16
60-71	16	42	56-63	7	19
72-83	3	8	64-72	6	16
84-95	1	3	73-80	4	11
Total	38	100	Total	37	100
Average	56,31		Average	53,51	

Source: Data processed using Microsoft Excel

Based on Table 4, the average pretest learning result for the experimental class was 56.31, and the control class was 53.51. It can be concluded that the average learning outcomes of the two classes are not much different, indicating that the two classes have initial abilities that are not much different.

Table 5. Normality Test

Normality Test							
Group				Shapiro-Wilk			
				Statistic	df	Sig.	
Results	PreEx	0,130	38	0,106	0,961	38	0,206
	PostEx	0,142	38	0,052	0,932	38	0,023
	PreControl	0,144	37	0,052	0,950	37	0,098
	PostControl	0,123	37	0,171	0,944	37	0,060
a. Lilliefors Significance Correction							

Based on Table 5, the normality value for the experimental class is 0.130, with a significance value of 0.106. Because sig. 0.106 > 0.05, then the experimental class pretest data is normally distributed. Furthermore, the normality value in the control class was 0.144, with a significance of 0.052. Because sig. 0.052 > 0.05, then the control class pretest data is normally distributed. It can be concluded that the experimental class and control class have a normal distribution.

Table 6. Homogeneity Test

Test of Homogeneity of Variance					
		Levene Statistic	df1	df2	Sig.
Results	Based on Mean	2,416	3	146	0,069
	Based on Median	1,949	3	146	0,124
	Based on Median and with adjusted df	1,949	3	123,460	0,125
	Based on trimmed mean	2,414	3	146	0,069

According to Table 6, the Based on Mean significance value was 0.124. This value shows that the two classes have the same variance because of the Sig value. 0.124 > 0.05, so the two classes are the same or homogeneous. Based on the normality test and homogeneity test that have been carried out, it can be concluded that both classes have the same initial abilities. The test results also show that the data is normal and homogeneous. Therefore, research data can be analyzed parametrically.

Table 7. Learning Interest of Experimental and Control Classes

Experimental Class			Control Class		
Interval	F	F Relative (%)	Interval	F	F Relative (%)
63-67	15	39	60-64	13	35
68-72	4	11	65-70	10	27
73-77	1	3	71-75	5	14
78-82	4	11	76-81	3	8
83-87	9	23	82-86	4	11
88-92	5	13	87-91	2	5
Total	38	100	Total	37	100
Average	75,55		Average	69,54	

Source: Data processed using Microsoft Excel

Based on Table 7, the average learning interest in the experimental class was 75.55, while the control class was 69.54. Furthermore, after learning the average interest of students from both classes, students with high and low interest were grouped in each class. In the experimental class, the average obtained was 75.55, so students with learning interest scores above this value were classified as high learning interest, while those below were classified as low learning interest. In the control class, the average obtained was 69.54, so learning interest scores above this value were classified as high learning interest, while those below were classified as low learning interest. The results of grouping learning interests can be seen in Table 8.

Table 8. Student Grouping Based on Learning Interests

No	Learning interest			
	Experiment		Control	
	High	Low	High	Low
1	92	63	91	60
2	90	65	88	60
3	90	65	85	60
4	88	65	83	60
5	88	65	82	60
6	87	65	81	60
7	87	65	80	61
8	87	65	76	61
9	87	65	76	61
10	86	65	74	62
11	86	65	73	63
12	84	65	73	64
13	84	67	72	65
14	83	67	72	65
15	82	68	70	66
16	80	71	70	66
17	79	72	70	66
18	78	72		66
19	78	73		67
				68
N	19	19	17	20

Source: Data processed using Microsoft Excel

Based on Table 8, the experimental class of students with high learning interests numbered 19 and students with low learning interests numbered 19. Meanwhile, in the control class, there were 17 students with high learning interests and 20 with low learning interests. So, of the 75 students, 36 had high learning interests, and 39 had low learning interests. In the core activities, the two classes in the research sample were given different treatments in the learning process. The experimental class used Wordwall learning media, while the control class used conventional learning material. After that, participants were given time to discuss the material to increase students' knowledge. After the learning was completed, both classes were given a posttest using the test-retest method, meaning that both the pretest and posttest used the same questions. This aims to see improvements after being given treatment. Below is a grouping of students based on posttest data on learning outcomes.

Table 9. Posttest Results in Experiment and Control Classes

Experimental Class			Control Class		
Interval	F	F Relative (%)	Interval	F	F Relative (%)
70-75	7	19	50-58	1	3
76-80	3	8	59-66	4	12
81-85	8	21	67-75	8	21
86-90	8	21	76-83	5	13
91-95	7	18	84-92	11	30
96-100	5	13	93-100	8	21
Total	38	100	Total	37	100
Average	87,5		Average	81,48	

Source: Data processed using Microsoft Excel

Based on Table 9, the average posttest result for experimental class students was 87.5, while for the control class, it was 81.48. It can be concluded that the average learning outcomes of students taught using Wordwall learning media are higher. Next, the student learning outcome is grouped according to learning interest data. The purpose of this grouping is to see the learning outcomes of students with high and low learning interests. Table 10 groups students' posttest learning outcomes based on learning interests.

Table 10. Posttest Score Grouping Data Based on Learning Interest

No	High Learning Interest		Low Learning Interest	
	Experimental	Control	Experimental	Control
1	85	70	90	60
2	95	95	75	75
3	90	60	90	85
4	100	85	85	85
5	95	90	90	80
6	80	75	75	100
7	95	100	70	95
8	85	60	85	90
9	75	70	75	80
10	80	75	95	90
11	95	100	100	95
12	75	50	90	60
13	80	90	85	85
14	85	90	95	75
15	100	75	90	95
16	90	80	85	80
17	75	85	90	75
18	85		100	85
19	100		95	95
20				80
Total	1665	1350	1660	1585
N	19	17	19	20
Average	87,63	79,41	87,37	83,42
Average Total	83,75		85,26	

Source: Data processed using Microsoft Excel

Table 10 shows that the average learning outcomes of students with high learning interest in the experimental class and control class are 83.75, while the average learning outcomes of students with low learning interest in the experimental class and control class are 85.26. Thus, it can be concluded that learning interest increases student learning outcomes. Next, the hypothesis test, namely the Two-Way ANOVA Test, can be seen in Table 11.

Table 11. Two-Way Anova Test

Tests of Between-Subjects Effects						
Dependent Variable: Learning Outcome PostTest						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	
Corrected Model	5764,887 ^a	3	1921,629	100,787	,000	
Intercept	398666,876	1	398666,876	20909,629	,000	
Learning Media	588,282	1	588,282	30,855	,000	
Learning interest	4955,722	1	4955,722	259,922	,000	
Learning Media * Learning Interest	69,191	1	69,191	4,629	,001	
Error	1353,699	71	19,066			
Total	404461,000	75				
Corrected Total	7118,587	74				

a. R Squared = ,810 (Adjusted R Squared = ,802)

Source: Data processed using SPSS 26

Based on Table 11, the obtained $F_{\text{calculated}}$ is 30,855, with a significance value of 5%, and df numerator 1 and df denominator 71 obtained value $F_{\text{table}} = 3,98$. $F_{\text{calculated}} > F_{\text{table}}$ is $30,855 > 3,98$ and significance value $0,000 < 0,05$, then the hypothesis test results are rejected H_0 and accept H_a at alpha level 5%. This shows the

significant influence of Wordwall media on student learning outcomes. The significant influence of Wordwall media on student learning outcomes aligns with prior research highlighting its advantages in enhancing engagement and interactive learning. Wordwall offers a gamified approach, making learning more enjoyable and motivating for students (Hasram et al., 2021; Mazelin et al., 2022; Widhiatama & Brameswari, 2024). Its user-friendly interface enables diverse customization of activities, catering to various learning styles and needs. Studies show interactive digital tools increase retention rates and comprehension levels, particularly in complex subjects (Pal'ová & Vejačka, 2020; Sadovets et al., 2022). This aligns with constructivist learning theories, emphasizing the importance of active participation in knowledge construction, ultimately fostering better learning outcomes.

$F_{\text{calculated}}$ of 259,922 and the significance value of learning interest of 0,000 were obtained. So F_{table} with the significance level 5% and df numerator 1 and df denominator 71 obtained the value $F_{\text{table}} = 3,98$. so $F_{\text{calculated}} > F_{\text{table}}$ is $259,922 > 3,98$ and significance value $0,000 < 0,05$, then the hypothesis test results are rejected H_0 and accept H_a at alpha level 5%. This shows that learning interest influences learning outcomes. Then, $F_{\text{calculated}}$ of 4,629, and the significance value of learning interest of 0,000 were obtained. For F_{table} with significance level 5% and df numerator 1 and df denominator 71 obtained value $F_{\text{table}} = 3,98$. so $F_{\text{calculated}} > F_{\text{table}}$ is $4,629 > 3,98$ and significance value $0,001 < 0,05$, then the hypothesis test results are rejected H_0 and accept H_a at alpha level 5%. This shows an interaction effect between using Wordwall media and learning interest on student learning outcomes. With Wordwall learning media, learning motivation will be high, so teachers should use this media in learning Indonesian or other lessons (Aditya & Pusposari, 2024; Moorhouse & Kohnke, 2024; Rodriguez-Escobar et al., 2023). Teachers are advised to design media according to the topic to be studied and the time used.

After comparing several research results regarding Wordwall learning media, such as Lestari and Rohmani (2024), it is explained that Wordwall media is reported to significantly increase students' learning interest, as seen from interest indicators such as excitement, involvement, attention, and interest (Schoenfeld, 2020; Teemant, 2020). For this reason, this research emphasizes that Wordwall can enhance students' learning motivation, especially when combined with high learning interest, and recommends the use of Wordwall in various lessons in madrasas (Sweller, 2020; Williamson, 2021). Furthermore, Chirca and Panisoara (2023) employ a more practical and contextual approach by providing direct intervention in the classroom and observing gradual changes in interest and learning outcomes (Chirca & Pânișoară, 2020; Kairu, 2021; Kulkarni et al., 2022). The results of this study provide insight into how changes in teaching methods can influence learning interest and outcomes sustainably (Campenhout et al., 2021; Santos & Castro, 2021; Suartama et al., 2020). This encourages the application of Wordwall media as a learning tool in the Merdeka Belajar era, focusing on increasing students' interest through an interactive and enjoyable approach (O'Connor, 2022; Svihla & Peele-Eady, 2020).

This research emphasizes the importance of combining technology in learning with enhancing students' interest to achieve optimal learning outcomes (Ali et al., 2021; Podgórska & Zdonek, 2024; Strohmaier et al., 2023). However, it is also important to note that the effectiveness of learning media like Wordwall can vary depending on factors such as the school's level of technological readiness, teacher competence in using the media, and individual differences among students (Khang et al., 2023; Mishra & Alok, 2022). Additional research is needed to explore how these factors interact and how they can be optimized in the madrasa environment (Herfroy-Mischler & Friedman, 2020). Furthermore, examining how learning media like Wordwall can be effectively integrated into the broader curriculum and its long-term impact on learning outcomes (Crum et al., 2013; Xu, 2024). This research demonstrates the great potential of using Wordwall as a learning tool in madrasas, mainly when supported by high learning interest (Major et al., 2021; Pierre et al., 2024). Proper implementation and sufficient teacher training are key to maximizing the benefits of this media.

CONCLUSION

This study reveals three key findings: First, Wordwall learning media significantly influences student learning outcomes in the Indonesian language subject, as evidenced by a substantial difference between the experimental and control classes. Second, student learning interest also significantly influences their academic performance, with higher interest leading to better outcomes. Third, a positive and significant interaction exists between Wordwall usage and learning interest, further enhancing student achievement. These findings imply that integrating interactive media like Wordwall can boost student learning interest and outcomes. Consequently, educators are encouraged to incorporate such media into their teaching, especially in language instruction, to foster active learning. The study suggests expanding future research by using larger experimental designs and including more diverse educational settings. Additionally, combining quantitative and qualitative approaches could offer a deeper understanding of how digital tools like Wordwall influence academic outcomes, student engagement, and social skills development. The research highlights the importance of considering

students' learning interests and the need for tailored, interactive media to create a more dynamic learning environment.

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