

# Digital Game-Based Learning Wordwall to Improve Vocabulary Mastery of Grade Eight Students at SMPN 2 Labobo

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## Article Info

### Article history:

Received 2026-02-08

Revised 2026-02-19

Accepted 2026-02-28

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### Keywords:

Digital game-based learning

Rural school

Vocabulary mastery

Wordwall

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## ABSTRACT

Rural EFL students at SMPN 2 Labobo face difficulties in mastering English vocabulary because the learning process is often boring and relies on traditional, teacher-centred methods, resulting in frequent word retention problems, inaccurate usage, and low motivation in learning English. Therefore, this research aimed to evaluate the effect of game-based learning using Wordwall on improving English vocabulary mastery of eighth-grade students at SMPN 2 Labobo. The research employed a quantitative pre-experimental design with a one-group pre-test and post-test approach, involving 19 students. The intervention consisted of six meetings using interactive Wordwall activities, including matching pairs, quizzes, word searches, sentence building, and categorisation, focusing on nouns, verbs, and adjectives in context. Vocabulary mastery was assessed via written tests evaluating grammatical accuracy, appropriate vocabulary use, and sentence clarity. Data from the pre-test and post-test were analysed using a paired-samples t-test. The results showed a significant improvement, with pre-test mean scores rising from 36.63 to 72.16 post-test, a gain of 35.53 points, and a paired t-test confirming statistical significance,  $t = -10.809$ ,  $p = 0.000$ . These findings highlight that Wordwall's strategy is effective in enhancing engagement and retention in a rural school context, offering pedagogical implications for integrating digital tools in English as a Foreign Language (EFL) instruction.

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## 1. INTRODUCTION

Vocabulary plays a crucial role in language learning because it supports listening, speaking, reading, and writing skills. Vocabulary is a basic English component and one element that links the four language skills. Vocabulary is the most important aspect of language proficiency because it determines how well learners speak, listen, read, and write

[1]. Vocabulary can be defined in various ways, but it generally refers to the knowledge of words and their meanings. It can also be viewed as an organised collection of terms and their definitions. Vocabulary consists of the words used to form sentences and convey meaning [2]. Nation [3] states that without grammar, little can be communicated, and without vocabulary, nothing can be communicated. In addition, vocabulary is needed for student growth and development before grammar and pronunciation. In vocabulary learning, parts of speech, fundamental categories that classify words by function, play a crucial role in the structure and meaning of language [4]. The phrase "part of speech" refers to how words are categorised according to their roles in conventional grammar [5]. In general, parts of speech consist of nouns, verbs, adjectives, adverbs, pronouns, prepositions, conjunctions, and interjections. Parts of speech are a basic structure in learning English.

Despite its importance, many students still struggle to learn vocabulary. Preliminary observations and questionnaires conducted at SMPN 2 Labobo indicated that eighth-grade students showed low engagement in learning English vocabulary. Many students quickly forgot new words, had difficulty applying vocabulary in sentence construction, and were reluctant to participate in classroom tasks. As a rural school in Banggai Regency, Central Sulawesi, SMPN 2 Labobo also faces common challenges, including limited learning resources and limited exposure to English outside the classroom. These conditions make vocabulary learning even more challenging and highlight the need for more engaging instructional strategies. Vocabulary-learning strategies are recognised as a key component of language learning. Foreign language learners often encounter difficulties in acquiring vocabulary; however, they can apply various strategies to address these challenges [6]. Therefore, vocabulary learning strategies remain an important area of discussion in applied linguistics.

To enhance students' interest, particularly in vocabulary mastery, teachers should choose an effective strategy and use various media to boost students' interest significantly. The use of interactive digital media is therefore essential to improve students' vocabulary mastery and increase their interest in learning English, especially in contexts where traditional methods have proven insufficient. Goodman *et al.* [7] state that media games can improve students' engagement, language skills, and learning effectiveness. The use of interactive digital media is therefore essential to improve students' vocabulary mastery and increase their interest in learning English, especially in contexts where traditional methods have proven insufficient. Game-based learning is considered one effective way to increase students' motivation and participation [8]. Kahar and Baa [9] explain that one digital platform that supports game-based learning is Wordwall. Wordwall allows teachers to design interactive activities, such as quizzes, matching tasks, and word-grouping games, that help students enjoyably practice vocabulary.

Wordwall is a web-based learning platform that offers interactive, gamified activities for teaching and assessment. Wordwall can be utilised by educators who wish to develop teaching methods that serve as assessment tools in the learning process [10]. Ratnasari *et al.* [11] state that this application serves as a learning medium, a resource, and an engaging online assessment tool for students. It enables teachers to create engaging exercises, such as quizzes, matching tasks, word searches, anagrams, crosswords, flashcards, and sorting

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games. These features help make learning more interactive and enjoyable while supporting innovative instructional practices [10]. Wordwall functions not only as a learning medium but also as a resource and assessment tool that encourages active student participation [12]. Wordwall is a useful resource for learning, media, and an enjoyable assessment tool for students [13]. This game can be accessed through laptops or smartphones and includes images, audio, animations, and interactive games that engage students. The platform integrates multimedia elements such as images, audio, animations, and game formats, which help students understand and remember vocabulary more effectively [14]. Although the traditional concept of a word wall refers to vocabulary displayed on classroom walls, the digital Wordwall transforms this idea into an interactive online environment where learners actively engage with words rather than passively observe them [15]. Through this interactive design, Wordwall supports meaningful vocabulary practice and increases learner involvement. Implementing Wordwall in vocabulary instruction typically involves selecting target words based on learning objectives, designing appropriate interactive activities, and engaging students in individual or collaborative practice. Teachers can also use the platform as a formative assessment tool to monitor progress and provide feedback. Empirical evidence indicates that students who learn vocabulary through Wordwall achieve better outcomes than those taught using conventional methods, highlighting its effectiveness as a digital game-based learning tool [16]. Overall, Wordwall supports vocabulary development by integrating motivation, interaction, practice, and assessment into a single digital platform.

Previous studies have demonstrated Wordwall's effectiveness in improving students' vocabulary mastery. Dwiningrum *et al.* [17] reported that Wordwall significantly enriched students' vocabulary, especially adjectives in descriptive texts, with a strong effect size indicating meaningful improvement after the treatment. Sitompul *et al.* [18] reported that students who learned vocabulary through Wordwall games outperformed those taught using traditional methods, with statistical analysis confirming a significant difference between groups. Umar *et al.* [19] revealed that various Wordwall activities, such as matching tasks, crossword puzzles, and meaning-guessing exercises, effectively enhanced students' vocabulary mastery at the beginner level. Napitupulu *et al.* [20] highlighted that integrating Wordwall not only improved students' vocabulary achievement but also increased their learning motivation. The study showed a substantial increase in students' scores after implementing Wordwall-based activities, suggesting that digital tools can create a more engaging and effective learning environment. However, to understand why Wordwall is effective in vocabulary mastery, it is necessary to examine its theoretical foundation in relation to language learning processes.

Wordwall strategy is an effective medium for improving vocabulary mastery and enhancing students' motivation and participation in English learning. Kapp [21] argues that gamification elements such as points, challenges, and competition enhance students' motivation and engagement, which are integrated within Wordwall's features. Rebecca [22] emphasises the importance of learning strategies in developing language proficiency, and Wordwall supports cognitive and memory strategies through structured practice. Mayer [23] states that combining visual and verbal input improves learning effectiveness, which aligns with Wordwall's interactive and visual-based activities. Through its interactive features,

Wordwall helps learners improve their vocabulary mastery through engaging, repeated practice.

Despite previous studies confirming Wordwall's effectiveness in enhancing students' vocabulary mastery and learning motivation, most existing research has been conducted in schools with relatively adequate technological facilities and students who are already familiar with digital learning environments. Many of these studies focused primarily on general vocabulary improvement without specifically examining how Wordwall supports students in using vocabulary within sentence contexts. In addition, limited empirical evidence is available regarding the implementation of Wordwall in rural junior high school settings where students have minimal exposure to educational technology and lower initial levels of English vocabulary mastery.

Therefore, this study aims to investigate whether Wordwall-based digital game learning significantly improves vocabulary mastery and learning engagement among eighth-grade students at SMPN 2 Labobo. Specifically, this research focuses on students' understanding and use of nouns, verbs, and adjectives in sentence contexts. By implementing Wordwall in a rural school environment, this study seeks to provide empirical evidence on the effectiveness of digital game-based learning in under-resourced settings. Accordingly, the research hypothesis is formulated as follows: H<sub>1</sub>: Game-based learning using Wordwall can affect vocabulary mastery in grade eight students at SMPN 2 Labobo. By examining the implementation of Wordwall in a rural school setting, this study is expected to provide new insights into how digital game-based learning can be effectively applied in under-resourced educational environments and contribute to the development of more engaging vocabulary instruction.

## **2. METHOD**

This research employed a quantitative pre-experimental design with a one-group pre-test and post-test. The pre-experimental design involved studying a single group that received an intervention, without a control group for comparison [24]. The research was conducted over four weeks: the students took a pre-test, received a treatment, and completed a post-test to measure their vocabulary mastery.

The research population consisted of the eighth-grade students of SMPN 2 Labobo in the 2025/2026 academic year. The class consisted of 19 students, and total sampling was used because the population consisted of only one class.

The treatment was conducted chronologically, with six meetings using Wordwall interactive games such as matching pairs, quizzes, word search, sentence building, and categorisation activities. The learning focused on vocabulary related to Classroom objects, past-tense verbs, Environmental nouns, Character traits, Feelings, and Sentence construction.

The Wordwall-based game learning strategy served as the independent variable, while students' vocabulary mastery was the dependent variable. Vocabulary mastery was measured through a written vocabulary test administered before and after the treatment. The test focused on students' ability to use concrete nouns, verbs, and descriptive adjectives in sentence contexts. The assessment instrument was developed based on vocabulary-learning

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indicators and adapted to the proficiency level of eighth-grade junior high school students, while maintaining essential aspects of vocabulary use, grammar accuracy, and sentence clarity.

Students' responses were evaluated using an analytical scoring rubric adapted from Brown [25] and applied consistently to both the pre-test and post-test. The rubric assessed three aspects:

- grammatical accuracy
- appropriate vocabulary use
- sentence clarity.

Each section of the test had different scoring weights, with a maximum total score of 55, which was later converted to a 0–100 scale for interpretation. The researcher served as the single rater and used the rubric descriptors to ensure consistent scoring. To support content validity, the test items and scoring rubric were designed to align with vocabulary learning objectives and were reviewed before use. A pilot scoring process was conducted to ensure familiarity with the rubric and consistent application of the scoring criteria. Although inter-rater reliability was not calculated, the use of a structured rubric and uniform scoring procedure was intended to enhance reliability.

The research was conducted in three main stages. First, a pre-test was administered to measure students' initial vocabulary mastery. Second, the treatment was implemented through Wordwall-based game learning over six meetings. During treatment, students engaged in interactive digital activities, such as matching games, quizzes, word searches, and sentence-building tasks, designed to reinforce vocabulary learning in meaningful contexts. Third, a post-test with the same format as the pre-test was administered to measure students' improvement after the intervention.

A quantitative analysis of students' pre-test and post-test scores was conducted to determine the effectiveness of Wordwall-based learning. Descriptive statistics, including mean scores and standard deviations, were calculated to summarise students' performance. A paired-samples t-test was then applied to examine whether there was a statistically significant difference between pre-test and post-test results. Prior to hypothesis testing, normality testing was conducted to ensure that the data met the assumptions required for parametric analysis. Hypothesis testing was carried out at a 0.05 level of significance. If the calculated t-value exceeded the critical value, the alternative hypothesis ( $H_1$ ) was accepted, indicating that Wordwall-based game learning significantly improved students' vocabulary mastery. Nevertheless, the findings should be interpreted cautiously and considered as empirical evidence within the context of this study.

### **3. RESULTS AND DISCUSSION**

The research findings demonstrate that implementing the Wordwall-based Digital Game-Based Learning strategy was effective in enhancing students' vocabulary mastery. The analysis of the pre-test and post-test scores revealed a substantial improvement in students' performance after the treatment was administered. Overall, the results indicate that using Wordwall contributed positively to students' vocabulary achievement.

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### 3.1. Results

The pre-test results showed that students' initial vocabulary mastery was relatively low. The pre-test mean score was 36.63, with a range of 7 to 87. The relatively large standard deviation (22.401) indicates that students' abilities were widely varied before the treatment. These findings suggest that most students still experienced difficulties in vocabulary recognition and usage prior to the instructional intervention.

Table 1. Pre-test and Post-test results

	N	Minimum	Maximum	Mean	Std. Deviation
Pre_Test	19	7	87	36.63	22.401
Post_Test	19	55	95	72.16	11.384
Valid N (listwise)	19				

After the treatment using Wordwall activities across six meetings, a post-test was administered to assess students' vocabulary mastery. The post-test results showed a clear increase in students' performance. The mean post-test score rose to 72.16, with a minimum score of 55 and a maximum of 95. In addition, the standard deviation decreased to 11.384, indicating that students' vocabulary abilities became more consistent after the intervention.

Table 2. Gain the score of both the Pre-test and the Post-test

Pre-test Mean	Post-test Mean	Gain
36.63	72.16	35.53

The comparison between pre-test and post-test mean scores shows a gain of 35.53 points, demonstrating a notable improvement in vocabulary mastery after using Wordwall.

Table 3. Paired sample t-test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre_Test - Post_Test	-35.526	14.327	3.287	-42.432	-28.621	-10.809	18	.000

The paired-samples t-test showed a mean difference of  $-35.526$  points between students' vocabulary scores before and after the treatment, indicating a significant improvement. The standard deviation is 14.327, and the standard error is 3.287, which reflects moderate variability. The 95% confidence interval  $-42.432$  to  $-28.621$  does not include zero, confirming a real difference.

Table 4 Paired T-test result

t-value	df	Sig. (2-tailed)	Decision
-10.809	18	0.000	Ha accepted

To verify whether this improvement was statistically significant, a paired sample t-test was conducted. The result revealed a Sig. (2-tailed) value of 0.000, which is lower than the significance level of 0.05. The obtained t-value of -10.809 (df = 18) indicates a statistically significant difference between students' vocabulary scores before and after the treatment.

### 3.2. Discussion

The results of this research indicate that Digital Game-Based Learning through Wordwall led to a statistically significant improvement in students' vocabulary mastery. The increase in the post-test mean score, along with the substantial gain score and significant t-test result, provides empirical evidence that the intervention positively influenced students' vocabulary learning. The improvement can be interpreted through Wordwall's characteristics as an interactive learning platform. Wordwall offers engaging digital activities, such as matching tasks, quizzes, and word games, that promote active student participation. These activities allow students to repeatedly encounter vocabulary in meaningful contexts, which supports better retention and understanding. Kapp et al. state that the element of gameplay also creates an enjoyable learning environment that can increase motivation and reduce learning boredom. This research employed a pre-experimental design, specifically a one-group pre-test-post-test design, involving one class of 19 students. The research procedure included administering a pre-test, implementing the treatment using WordWall, and administering a post-test.

Before the treatment was applied, a pre-test was conducted to measure students' initial vocabulary mastery. The pre-test results indicated that students' vocabulary mastery was relatively low. Many students had difficulty remembering vocabulary and using words correctly in context. These difficulties suggest that students need a more engaging and interactive learning approach to support their vocabulary development.

After the pre-test, the researcher implemented the treatment using Digital Game-Based Learning through Wordwall. During treatment sessions, students learned vocabulary through interactive digital games from Wordwall, such as matching games, word searches, and quizzes. These activities encouraged students to participate in the learning process actively, increased their motivation, and created a more enjoyable classroom atmosphere. As a result, students were more engaged and willing to practice and recall new vocabulary.

Following the treatment, a post-test was administered to assess students' vocabulary mastery after WordWall implementation. The results showed a significant improvement in students' vocabulary scores. This improvement was statistically confirmed by the Paired Sample t-Test, which revealed a Sig. (2-tailed) value of 0.000, lower than the significance level of 0.05. This indicates a significant difference between the Pre-Test and Post-Test scores, demonstrating that WordWall had a significant effect on students' vocabulary mastery.

Moreover, the mean difference between the Pre-Test and Post-Test was -35.526, indicating that the Post-Test score was higher than the Pre-Test score. The 95% confidence interval, ranging from -42.432 to -28.621, was entirely negative, further confirming that students' vocabulary mastery improved consistently after the treatment. The obtained t-value of -10.809 with 18 degrees of freedom also indicates a very large statistical difference in students' vocabulary mastery before and after using WordWall.

The significant improvement in vocabulary mastery can be attributed to the nature of Digital Game-Based Learning using Wordwall, which emphasises interaction, repetition, and immediate feedback. Wordwall helps students learn vocabulary in a fun and meaningful way, reducing boredom and anxiety during English learning. Through game-based activities, students are more motivated to engage with vocabulary learning, which enhances retention and understanding.

#### **4. CONCLUSION**

The findings of this research demonstrated that implementing Digital Game-Based Learning using Wordwall effectively improves vocabulary mastery among eighth-grade students at SMPN 2 Labobo. The pre-test and post-test results indicated a significant improvement in students' vocabulary mastery following the implementation of wordwall-based learning activities. The use of interactive and gamified activities creates meaningful learning experiences that support active participation and repeated vocabulary practice. The findings imply that integrating digital game-based platforms into English instruction can be an effective pedagogical strategy, particularly for supporting vocabulary mastery and increasing student involvement. This research also contributes to the growing body of research on technology-enhanced language learning by demonstrating the practical value of gamified digital tools in classroom settings, especially in rural schools.

However, this research was limited to a single class of eighth-grade students at a single school and conducted within a limited time frame. Technical issues, such as internet connectivity problems during one meeting, also affected the learning process. Therefore, the findings may not be generalised to broader contexts without further investigation. For future research, it is recommended to conduct studies with larger samples, control groups, and longer implementation periods to obtain more comprehensive results. Further studies may also explore the application of Wordwall in improving other English skills or examine its long-term impact on language learning. Overall, this research contributes to educators and the general public by providing evidence that digital game-based learning can be a practical, accessible solution for improving vocabulary mastery in secondary education.

#### **ACKNOWLEDGEMENTS**

The researcher extends heartfelt thanks to all individuals who contributed to the successful completion of this study. Special thanks go to the principal of SMPN 2 Labobo, Pislán A. Busia, S.Pd., for approving the research, and to the English teacher, Ms Muraisah, S.Pd., for her collaboration and assistance during data collection. Finally, Deep gratitude is also expressed to the students of class eight for their enthusiastic involvement.

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