

The effectiveness of wordwall games on students' vocabulary mastery at SMK NU Al-Futuhiyyah Muncar

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Abstract: The use of digital game-based platforms in English language learning has become increasingly popular in vocational schools. However, despite their widespread adoption, empirical evidence regarding their effectiveness in enhancing students' English language proficiency remains limited. Wordwall, a digital game-based learning platform, provides interactive activities that can support vocabulary learning. Therefore, examining the effectiveness of Wordwall Games in enhancing students' vocabulary mastery is essential. The objective of this study is to investigate the effectiveness of Wordwall Games on the vocabulary mastery of tenth-grade students at SMK NU Al-Futuhiyyah Muncar. This research employed a pre-experimental one-group pre-test and post-test design to measure the effectiveness of the treatment. Data were collected through vocabulary tests and analyzed quantitatively using a paired sample t-test. The results showed that the mean score increased from 53.40 in the pre-test to 80.33 in the post-test. The paired sample t-test revealed a significance value of 0.001, which was lower than 0.05. These finding indicates that Wordwall Games are effective in enhancing students' vocabulary mastery, supporting its use in vocational English learning contexts.

Keywords: Wordwall Games, Vocabulary Mastery, Game-Based Learning

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Introduction

In Indonesia, English holds an essential position in the national curriculum, and it is introduced to students from an early age with the expectation that they will be able to compete in international spheres. Mastering English, however, is a complex process that extends beyond the understanding of grammar rules, and it requires the integration of listening, speaking, reading, and writing skills, supported by cultural awareness and language exposure. One of the foundational elements that underpins all these skills is vocabulary. In acquiring a language particularly English, learners must develop four fundamental skills (reading, writing, listening, and speaking). Each of these skills is essential for effective communication. Reading enhances comprehension of written texts and helps broaden vocabulary, whereas writing provides a medium to convey ideas clearly and logically. Listening is vital for understanding spoken language in diverse situations, and speaking enables learners to actively participate in meaningful dialogue. However, underlying all these skills is one critical element that must be mastered to achieve proficiency in English, namely vocabulary. Vocabulary refers to the set of words individuals must understand to communicate effectively, encompassing both expressive vocabulary (used in speaking) and receptive vocabulary (used in listening) (Alqahtani, 2015). According to Schmitt theory, vocabulary is a key element in acquiring a new language and must be mastered (Zano, 2022). In English language learning, building a strong vocabulary foundation is a critical first step. McCarten (2007) proposes that knowing approximately 2,000 words is a reasonable goal, as this number typically reflects the words most frequently used in everyday conversations (Farikha, 2024). Vocabulary as a set

of words employed in a language for communication purposes (Agustin & Ayu, 2021). Moreover, vocabulary is central to second language learning and overall proficiency, as it significantly influences learners' performance in speaking, listening, reading, and writing (Susanto, 2017). Having a solid vocabulary base is essential for students to effectively comprehend and use the language. Vocabulary mastery is important for conveying thoughts clearly and interpreting others' messages effectively. It involves advanced competence in understanding language and applying words accurately within context. Susanto added that a strong vocabulary base is critical for students to comprehend and communicate proficiently in a second language. Furthermore, learner motivation and interest are key contributors to successful vocabulary acquisition and long-term memory. As noted by vocabulary plays an integral role in the four core language skills (speaking, listening, reading, and writing) (Ali, 2022). Inadequate vocabulary can hinder learners from constructing coherent sentences, grasping spoken or written content, articulating ideas verbally, or understanding texts. For these reasons, vocabulary mastery must be regarded as a foundational aspect of effective language learning. Vocabulary plays a vital role in language acquisition and is fundamental for effective communication as well. A clear understanding of various vocabulary types can significantly ease the language learning process. Understanding word classes helps students apply their vocabulary more accurately in communication. The term word class or part of speech refers to the grammatical categorization of words based on their roles within sentence structures, as described in traditional grammar frameworks (Nordquist, 2024). Parts of speech are categories that define a word's grammatical or lexical function within a sentence (Mariani et al., 2019). Common word classes include nouns, pronouns, verbs, adjectives, adverbs, conjunctions, prepositions, determiners, and interjections (Finegan, 2015; Nordquist, 2024). Finegan states that each of these categories possesses unique forms and functions, and a solid understanding of these lexical groups is crucial for forming grammatically accurate sentences. Furthermore, Finegan identifies eight major parts of speech, they are nouns, verbs, adjectives, adverbs, pronouns, prepositions, conjunctions, and determiners. Through understanding those word classes, learners can significantly enhance their English language skills.

Vocabulary is generally divided into two main categories. These categories are commonly referred to as productive (active) vocabulary and receptive (passive) vocabulary (San Mateo-Valdehita & Criado De Diego, 2021). The first includes words that learners can confidently use in both spoken and written forms because they fully grasp their meanings. In contrast, the second comprises words that are recognized during reading or listening but are not actively used in speech or writing. Productive vocabulary consists of words that learners can actively apply in speaking, writing, and spelling tasks (Maskor & Baharudin, 2016). These are terms not only understood but also appropriately used in context. Proficiency in productive vocabulary is essential for clear expression of thoughts, feelings, and ideas. It requires continuous practice—especially through writing and speaking—to reinforce understanding and memorizing. As learners become more confident in using grammatical structures, their productive vocabulary tends to expand. Since this vocabulary type engages active mental processing, meaningful interaction is crucial for effective acquisition. Therefore, mastering productive vocabulary is key to achieving fluency and communicative competence. While receptive vocabulary includes words that learners can identify and comprehend when encountered in reading or listening contexts, although they may not be able to use them spontaneously in speaking or writing. This vocabulary type is essential for understanding and interpreting language, as it aids in processing information efficiently. Generally, receptive vocabulary is broader than productive vocabulary, as learners often recognize more words than they use. Enhancing receptive vocabulary can be achieved through consistent exposure to texts, audio materials, and real-life spoken interactions. Nevertheless, transitioning receptive vocabulary into productive use requires intentional practice, such as applying the words in writing or conversation. Strengthening receptive vocabulary is crucial for overall language development, especially for understanding complex texts and verbal communication. Active vocabulary

is associated with the ability to speak and write, whereas receptive (passive) vocabulary relates to the ability to read and listen. It consists of words that students recognize and understand while reading or listening to a text. Productive vocabulary includes words that students can actively use in speaking and writing. For example, students utilize their productive vocabulary effectively in delivering a speech.

Based on a preliminary observation conducted on May 2025, many 10th-grade students experienced difficulties in understanding English texts due to limited vocabulary knowledge. Furthermore, the English teacher reported that students frequently struggled to understand the meaning of unfamiliar words and often relied on translation dictionaries and tools during classroom activities. SMK NU Al-Futuhiyyah Muncar is a vocational high school whose students have limited opportunities to use English in daily communication. Based on classroom observations, many students showed low participation during English lessons and encountered difficulties in understanding vocabulary used in writing and speaking activities. The teacher also reported that students tended to forget newly learned words and lacked motivation to learn vocabulary through conventional teaching methods and media. The students' limited vocabulary mastery suggests that conventional teaching methods may not be sufficient to fully engage learners in the vocabulary learning process. Therefore, innovative learning media are needed to make vocabulary instruction more interactive, motivating, and effective. Conventional teaching methods of teaching vocabulary often involve rote memorization, which can lead to disengagement and limited memory. However, with technological progress, various innovative tools have been developed to make vocabulary acquisition more engaging and interactive. These tools enable students to practice new vocabulary in dynamic contexts, thereby enhancing both comprehension and long-term memory. Therefore, this research is needed to determine whether the use of games-based learning can significantly enhance students' vocabulary achievement. This study is important because it provides evidence-based insights into the effectiveness of game-based learning in vocabulary instruction. The findings are expected to contribute both theoretically and practically by enriching the literature on technology-assisted language learning and offering English teachers an alternative instructional medium to create more engaging and effective vocabulary learning experiences.

Among the various technology-assisted learning platforms available today, Wordwall has gained increasing attention for its ability to support interactive and engaging language learning. Wordwall Games incorporate game-based learning activities that actively engage students in vocabulary practice. Wordwall Games are web-based interactive activities that provide students with engaging opportunities to practice and reinforce their learning such as assessment, matching, pairing, anagrams, random words, word searches, and classifications, etc. (Fitria, 2023). The application serves as a tool for designing engaging and interactive educational content. Gamified learning platforms like Wordwall Games foster motivation and engagement, creating a dynamic and effective learning environment (Çil, 2021; Santosa et al., 2021). Wordwall Games combine activities such as matching games, word puzzles, and timed quizzes, which not only make learning enjoyable but also reinforce vocabulary memory through repeated exposure. By providing immediate feedback, Wordwall Games enable students to correct mistakes in real-time, enhancing their understanding. Moreover, its gamified features introduce a competitive element that increases student participation and enthusiasm. Wordwall Games can customize activities based on specific learning objectives, which makes it particularly suitable for diverse classroom settings. Teachers can design tailored games that address the unique challenges faced by their students, ensuring that the content aligns with specific learning goals. Wordwall Games play could help students' to enhance vocabulary mastery through its engaging and customizable game-based learning approach. Wordwall Games serve as an effective educational medium that teachers can employ to boost students' motivation in acquiring vocabulary. The features in Wordwall application such as game templates, theme, feedback section, and leaderboard, may stimulate students' motivation in learning new language and has a significant effect on their vocabulary mastery (Adnyana & Dewi, 2022; Fakhruddin et al., 2021). It can be said that Wordwall Games can be an advantageous tool to assist

students in gaining higher score. Pipi (2019) said that Wordwall Games are a web-based program that offers a range of functions, such as themed bulletin boards and interactive activities, including vocabulary games, which serve as teaching aids (Fitriani, 2024). Wordwall Games offer a diverse range of game activities with its collection of templates and bulletin words. In fact, there are eighteen templates on it, such as maze chase, airplane, quiz, missing words, anagram, word search, match up, find the match, etc. This program has the potential to serve as a dynamic learning resource, offering students a diverse range of learning opportunities, multimedia content, and assessment capabilities (Fakhrudin et al., 2021). Wordwall Games showcase innovative and accessible practices employed by teachers, hence facilitating the seamless utilization and generation of instructional resources offered by the platform, particularly for beginners. Wordwall Games can be said to be a web-based program designed for the purpose of creating engaging quizzes that incorporate teaching content. This web application is highly worthy for the creation of a teaching tool that facilitates both learning and assessment. Inserting Wordwall Games may activate students' participation and engagement. Wordwall Games may remove the boredom among students in learning since these game templates offer the flexibility to tailor topics according to diverse learning preferences (Az Zahrah & Anwar, 2023). Since it provides engaging templates for learning games in classes, Wordwall Games can be a great consideration to be used in the English classroom. Wordwall Games has been proven to give numerous advantages since it comes in the form of an interactive learning game, which can be used as a medium in teaching and learning activities. The students will have the opportunity to answer questions given by the teacher in a very intriguing way using the game templates provided by Wordwall Games.

Several previous studies have investigated the use of Wordwall in English language learning and reported positive outcomes. The first study that was conducted by Syamsidar in 2023, entitled "Wordwalls on Vocabulary Mastery in Learning English." The results indicated that Wordwall Games significantly contributed to the enhancement of students' vocabulary, and the average score is 73.5% (the scores for pronunciation reached 74.3%, spelling 72.1%, and meaning 74.3%). It indicates that Wordwall games are effective in learning English especially in enhancing their vocabulary mastery (Syamsidar et al., 2023). Then, the second study that was conducted by Khasanah and Suminar in 2023, entitled "Educational Online Game for Studying Vocabulary: Wordwall on Pupils' Perceptions". This qualitative research used questionnaires to collect the data and there were 3 topics of students' perception examined in this investigation. They were feeling, engagement, and effect. The data findings concluded that most of the students gave a score of 80.5 % of positiveness to it. Those students stated that Wordwall had good effects and they did not want to skip playing it. However, there was a neutral result found that no significant effect appearing in students for this part (Khasanah & Suminar, 2023). The similarity shared across those previous studies and the present study focus on Wordwall Games. The second study and present study has the same respondent, those respondent are 10th grade students from vocational high school or *Sekolah Menengah Kejuruan* (SMK). However, there are some key distinctions between those previous studies and the present study. In the first study, the research method used is quantitative with a one-shot case study, and the respondents were the students in the 8th junior high school. It used questionnaire with a Likert Scale that focus on pronunciation, spelling, and meaning, while this present study used a pre-experimental one-group pre-test and post-test design and the respondents are 10th grade students from vocational high school (SMK). Then, the second study was qualitative research to measure the students' perception about Wordwall game, while this present study is a quantitative research that employed a pre-experimental one-group pre-test and post-test design.

Therefore, this present study contributes to the existing literature by employing a pre-experimental one-group pre-test and post-test design. This study provides empirical evidence of vocabulary enhancement within the context of vocational education, which has received limited attention in previous research. The objective of this study is to investigate the effectiveness of Wordwall Games on 10th-Grade Students vocabulary mastery of the at SMK NU Al-Futuhiyyah Muncar in the

2024/2025 Academic Year. Then, the hypotheses of this study are formulated as follows 1) The Null Hypothesis (Ho) is there is no effect of wordwall games usage on the vocabulary mastery of the tenth-grade students at SMK NU Al-Futuhiyyah Muncar, and 2). The alternative hypothesis (Ha) is there is effect of wordwall games usage on the vocabulary mastery of the tenth-grade students at SMK NU Al-Futuhiyyah Muncar. So if the alternative hypothesis (Ha) is accepted, the null hypothesis (Ho) is rejected, and if the null hypothesis (Ho) is accepted, the alternative hypothesis (Ha) is rejected.

Method

This research was conducted at SMK NU Al-Futuhiyyah Muncar, located on Patungraya Street, Tembokrejo Village, Muncar District. The population of this study consisted of all tenth-grade students of the TBSM (Motorcycle Engineering and Business) program at SMK NU Al-Futuhiyyah Muncar. Since the population was relatively small, total sampling was employed, resulting in 15 male students being selected as the research participants. The researcher used pre-experimental design because the researcher wants to compare the students' vocabulary before and after the treatment through the pre-test and post-test. In addition, this research will be conducted for one group Pre-test and Post-test design. To implement this design, the researcher conducts the treatment in three teaching sessions, each integrating the use of Wordwall Games. The pre-test is given before the first session to assess students' vocabulary mastery. After the final session, a post-test is administered to evaluate the enhancement in students' vocabulary knowledge as a result of the intervention. In this study, the instrument used is a vocabulary test designed to assess students' vocabulary mastery. This research used a vocabulary test in the form of multiple-choice items to measure the effect of using Wordwall Games usage on students' vocabulary mastery. The vocabulary test consisted of 32 questions, each with four answer options. The test items are designed to cover various aspects of vocabulary, including adjectives, nouns, verbs, and adverbs. The data collected from both the pre-test and post-test were analyzed using IBM SPSS Statistics version 25. Descriptive statistics were used to summarize the data. Prior to hypothesis testing, the data were screened for completeness and accuracy. Subsequently, the normality assumption was assessed using the Shapiro-Wilk test because the sample size was fewer than 50 participants. After the normality assumption had been verified, a Paired Sample t-Test was conducted to determine the effectiveness of Wordwall Games on students' vocabulary mastery.

Results and Discussion

The researcher administered two vocabulary tests, they are pre-test and a post-test. The results of both tests are analysis in the following sections.

The Result of Vocabulary Pre-Test

Vocabulary pre-test was given to evaluate students' vocabulary mastery before receiving treatment using Wordwall Games. The test consisted of 32 multiple-choice questions that assessed four types of word classes (nouns, verbs, adjectives, and adverbs). The vocabulary used in the test was related to the field of Motorcycle Engineering and Business, which aligns with the students' major.

Table 1. The Interval and Frequency Number of Vocabulary Pre-Test

Interval	Frequency	Respondent	Score
66–70	2	M. H. R. W. J.	66
		R.E.A.	66
61–65	1	M.A.R.	63
56–60	4	A.V.S.	56
		M.G.M.	59
		S.I.	59
		M.W.F.	59

Interval	Frequency	Respondent	Score
51–55	2	R.A.F.	53
		M.F.S.	53
46–50	2	G.D.A.	50
		N.H.S.	47
41–45	4	M.B.S.	44
		W.T.A.	44
		A.S.	41
		M.M.M	41
Average Score			53.40

(Note: Students' names have been replaced with initials to protect the respondents' privacy)

Based on the results, the pre-test scores ranged from 41 to 70. There are 4 students in 56-60 and 41-45 score interval. Those indicated that many students had difficulty recognizing and understanding English vocabulary. The average score was 53.40, which reflects a low level of initial vocabulary mastery.

The Result of Vocabulary Post-Test

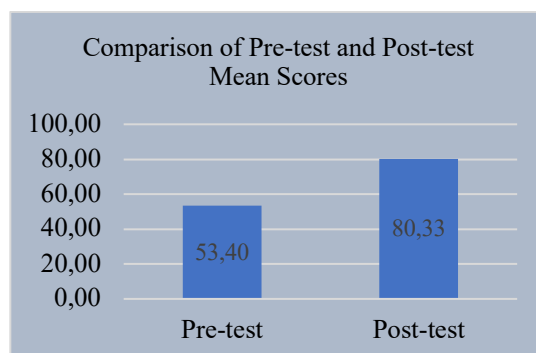
After the implementation of Wordwall Games across three learning sessions, a vocabulary post-test was administered to measure the students' vocabulary mastery. The test was designed to be equivalent in structure and content to the pre-test, ensuring valid and reliable comparison. The pre-test, the post-test consisted of 32 multiple-choice questions focused on nouns, verbs, adjectives, and adverbs.

Table 2. The Interval and Frequency Number of Vocabulary Post-Test

Interval	Frequency	Name	Score
91–95	1	M.H.R.W.J.	91
86–90	1	M.A.R.	88
81–85	7	M.W.F.	84
		M.G.M.	84
		A.V.S	84
		R.E.A	84
		A. S.	81
		R.A.F.	81
		M.F.S.	81
76–80	2	S.I	78
		G.D.A.	78
71–75	3	M.M.M.	75
		W.T.A.	75
		N.H.S	72
66–70	1	M.B.S.	69
Average Score			80.33

(Note: Students' names have been replaced with initials to protect the respondents' privacy)

The post-test scores ranged from 66 to 91, with the highest frequency (7 students) in 81-85 score interval. The average score increased significantly to 80.33, representing a 26,93 point enhancement from the pre-test average of 53.40 To provide a clearer illustration of students' progress, the following table displays the comparison between the pre-test and post-test mean scores.



Picture 1. Comparison of Pre-test and Post-test Mean Scores

Based on the data presented above, the comparison between the students' mean pre-test and post-test scores indicates a considerable enhancement in vocabulary mastery after the implementation of Wordwall Games. The mean score increased from 53.40 in the pre-test to 80.33 in the post-test, resulting in a mean gain of 26.93 points. This enhancement suggests that Wordwall Games contributed positively to enhancing students' vocabulary achievement. Furthermore, the Paired Sample Statistics table shows that the mean post-test score (80.33) was higher than the mean pre-test score (53.40). The Paired Samples Test revealed a mean difference of 26.933, with a t-value of 19.16, $df = 14$, and a significance value (2-tailed) of 0.001. Since the significance value was lower than the alpha level of 0.05 ($p < 0.05$), the null hypothesis (H_0) was rejected, and the alternative hypothesis (H_1) was accepted. These findings indicate that there was a statistically significant difference between the students' pre-test and post-test scores. Therefore, it can be concluded that the use of Wordwall Games was effective in enhancing students' vocabulary mastery.

The significance of this research can be divided into theoretical and practical contributions. Theoretically, this study is expected to enrich the literature on technology-enhanced language learning, particularly in the area of digital game-based learning for vocabulary acquisition. The findings may provide additional evidence supporting the effectiveness of interactive learning media, such as Wordwall Games, in enhancing students' vocabulary mastery and contributing to the development of foreign language acquisition theories related to engagement and motivation. Practically, this research is expected to be beneficial for English teachers, students, and schools. For teachers, the findings may serve as an alternative instructional strategy to create more engaging and effective vocabulary learning activities. For students, the use of Wordwall Games can enhance motivation, participation, and vocabulary memory through interactive and enjoyable learning experiences. For schools, this study may provide input in integrating digital learning media into English language teaching to enhance the learning outcomes in vocational education settings.

Discussion

The findings of this research indicated that Wordwall Game had a significant effect on vocabulary mastery of tenth-grade students at SMK NU Al-Futuhiyyah Muncar. The analysis of pre-test and post-test scores showed a substantial increase, with the mean rising from 53.40 in pre-test to 80.33 in post-test. The Paired Sample t-Test result showed a significance value of 0.001, which is lower than the standard threshold of 0.05, indicating a statistically significant difference after the treatment. This progress may be attributed to the interactive and engaging features of Wordwall. Through game-based activities such as matching exercises, quizzes, and interactive vocabulary reinforcement activities, students were exposed to repeated encounters with target vocabulary in a meaningful context. Such repeated exposure is essential for vocabulary memory because learners need multiple opportunities to recognize, recall, and use new words. Furthermore, the competitive and enjoyable nature of the games may have increased students' motivation and participation during the learning process. As a result,

students became more actively involved in learning activities, which contributed to their enhanced vocabulary mastery.

The findings of the present study are consistent with those reported by Syamsidar (2023), who found that Wordwall Games were effective in English language learning, particularly in enhancing students' vocabulary mastery. Similarly, the current study demonstrated a significant increase in students' vocabulary achievement after the implementation of Wordwall Games, indicating that game-based learning can positively support vocabulary mastery. The similarity between the two studies lies in their conclusion that Wordwall serves as an effective medium for enhancing students' vocabulary learning outcomes. The present findings are also supported by Khasanah and Suminar (2023), who reported that students showed highly positive perceptions of Wordwall, with 80.5% of respondents expressing positive attitudes toward its use. Their study revealed that Wordwall increased students' engagement and motivation, as students enjoyed participating in the activities and were reluctant to miss the games. Likewise, students in the present study appeared actively involved in the learning process, which may have contributed to the enhancement in their vocabulary mastery. Despite these similarities, several differences can be identified. Syamsidar (2023) primarily focused on examining the effectiveness of Wordwall in vocabulary learning, whereas the present study specifically measured the extent of vocabulary enhancement through a one-group pretest-posttest experimental design among tenth-grade vocational high school students. In addition, while Khasanah and Suminar (2023) concentrated on students' perceptions, engagement, and attitudes toward Wordwall, the current study emphasized learning outcomes by statistically analyzing students' vocabulary test scores before and after the treatment. Therefore, this present study complements previous research by providing empirical evidence that the positive engagement and motivation generated by Wordwall can be associated with measurable enhancement in vocabulary mastery.

The increasing level of involvement in this present study may explain the enhancement in students' vocabulary mastery, as active participation is closely associated with successful language learning. In line of this explanation, game-based learning platforms such as Wordwall Games have an effect student engagement and motivation two key factors in effective vocabulary acquisition (Fakhrudin et al., 2021; Santosa et al., 2021). By offering dynamic, competitive, and visually engaging learning experiences, Wordwall enables students to retain vocabulary more effectively than traditional methods such as rote memorization. The use of Wordwall Games support the gamification approach, which is widely recognized for enhancing student participation and learning outcomes through the integration of game elements into instructional settings. Gamification fosters motivation by incorporating interactive tasks, real-time feedback, and reward systems (Putu Wulantari et al., 2023; Thiagarajah et al., 2022). The enhancement observed in this study reflects the effectiveness of digital tools when implemented in vocational education contexts. In particular, students in the Motorcycle Engineering and Business (TBSM) program responded enthusiastically to vocabulary learning when delivered through game-based formats, which align with their practical and hands-on learning preferences. These findings also support Schmitt's theory that vocabulary is a foundational component of language learning and that meaningful engagement is essential for long-term memory (Zano, 2022).

The effect of Wordwall Games can attribute to its visual connection, auditory, and kinesthetic learning styles, which accomodates to different types of learners. The interactive games engage multiple senses simultaneously, helping students to process and store new vocabulary more efficiently. Moreover, the gamified nature of Wordwall Games are known to stimulate positive emotional responses and increase dopamine levels, which can enhance motivation and memory. These elements work together to create a dynamic learning environment that supports long-term vocabulary acquisition. Furthermore, Wordwall games facilitated this by providing repeated exposure to vocabulary through varied and interactive activities, reinforcing both receptive and productive vocabulary skills. This research utilized a one-group pretest-posttest design, which poses limitations to internal validity because

there is no control group was included for comparison. External factors such as the testing effect or practice effect could not be ruled out as influences on the results. Future studies should adopt a quasi-experimental or true experimental design to confirm the findings and provide stronger evidence of the effectiveness of Wordwall Games.

Conclusion

Based on the findings of this study, students' vocabulary mastery enhanced significantly after the implementation of Wordwall Games. The mean score increased from 53.13 in pre-test to 80.60 in post-test. Furthermore, the Paired Sample t-Test showed a significance value of 0.001, which was lower than the significance level of 0.05, indicating a statistically significant difference between pre-test and post-test scores. Therefore, it can be concluded that Wordwall Games are effective in enhancing students' vocabulary mastery. These findings suggest that Wordwall Games can serve as an engaging and effective instructional medium for vocabulary learning, particularly for vocational high school students. Therefore, English teachers are encouraged to integrate Wordwall Games into vocabulary instruction to promote students' engagement and vocabulary development.

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