



The Effectiveness of Wordwall on English Tense Mastery and Learning Motivation

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Article Info

Article history:

Received 20 June 2026

Received in revised form 15

July 2026

Accepted 28 July 2026

Keywords:

Digital Game-Based Learning

Wordwall

Grammar Mastery

EFL

Quasi-Experimental Study

Abstract

This study investigates the effectiveness of Digital Game-Based Learning (DGBL) in improving students' grammar mastery in English as a Foreign Language (EFL) context. The integration of digital games into language instruction has gained increasing attention as an innovative pedagogical approach that promotes interactive, engaging, and student-centered learning environments. This research employed a quasi-experimental design with a non-equivalent control group involving two intact classes of tenth-grade students. The experimental group received grammar instruction through Wordwall-based DGBL activities, while the control group was taught using conventional teaching methods. Data were collected through pre-tests and post-tests to measure students' grammar achievement. The results were analyzed using statistical procedures to determine the effectiveness of the treatment. The findings indicate that students in the experimental group showed significantly higher improvement in grammar performance compared to those in the control group. This suggests that the implementation of DGBL, particularly through Wordwall, can effectively enhance students' understanding and retention of grammatical structures. Furthermore, the study highlights that DGBL not only improves cognitive outcomes but also increases students' motivation and engagement in learning English. Therefore, it is recommended that English teachers integrate digital game-based platforms into classroom instruction to create more interactive and meaningful learning experiences.

Introduction

Among the various aspects of grammar, mastery of English tenses remains one of the most fundamental yet persistently challenging areas for English as a Foreign Language (EFL) learners (Listia & Febriyanti, 2020; Ali et al., 2021; Epa et al., 2025). Previous studies have consistently reported that learners experience significant difficulties in understanding and applying tense structures. Al-Quyadi (2016) found that EFL learners often perceive tense and aspect as highly complex, particularly because many of these structures do not exist in their first language. In the Indonesian context, Listia and Febriyanti (2020), as well as Zhang et al. (2024), revealed that students commonly struggle with tenses such as past perfect and future perfect continuous due to first-language interference, limited exposure, and insufficient practice opportunities. Similarly, Damis et al. (2024) emphasize that the dominance of teacher-centered instruction and lack of meaningful language use contribute to learners' low grammatical competence. Nawira et al. (2019) further highlight that EFL students often experience low grammatical confidence, which affects both comprehension and production of English structures. Collectively, these findings indicate that grammar instruction, particularly in tense mastery, requires more interactive and meaningful learning approaches (Krisbiantoro, 2020; Permana et al., 2025; Yusuf & Ali, 2025).

Similar challenges were identified in the instructional context of SMA Kristen Elim, Makassar. Based on classroom observations conducted during the researcher's teaching practicum under the Professional Teacher Education Program (PPG), it was found that tenth-grade students experienced considerable difficulty in understanding and applying English tenses, particularly in written sentence construction. Students frequently showed confusion in selecting appropriate tense forms, especially among the simple present, present continuous, present perfect, and present perfect continuous tenses. Informal discussions with the English teacher further confirmed that students' achievement in grammar-based assessments was generally lower compared to other language skills such as reading and speaking, with tense-related tasks consistently identified as the most difficult component in classroom assessments. This condition indicates that grammar learning, particularly tense usage, remains a serious instructional problem in the research setting (Mustakim et al., 2025; Paris & Ali, 2025; Julianto & Adha, 2026).

To further validate these findings, a preliminary test (pre-test) was administered before the implementation of the treatment (Ibrahim et al., 2026; Husna et al., 2026). The results showed that only 1 out of 54 students from both the experimental and control classes achieved the minimum mastery criterion (KKM) of 75, while the vast majority of students scored below the standard. The mean score was categorized as low, indicating limited mastery of English tenses at the initial stage of the study. These results confirm the earlier classroom observations and teacher reports, demonstrating that students' grammatical competence, particularly in tense usage, is still inadequate and requires immediate instructional intervention (Bardovi-Harlig & Bardovi-Harlig, 2025; Derakhshan, 2026; Damanik et al., 2025).

One contributing factor to this problem is students' low learning motivation. According to Deci and Ryan (2000), Self-Determination Theory posits that motivation plays a crucial role in determining learners' engagement, persistence, and academic achievement. When learning activities are perceived as monotonous and less meaningful, students tend to show low motivation, which negatively affects their learning outcomes. Therefore, innovative and engaging instructional strategies are needed to enhance both students' motivation and their understanding of grammar concepts.

Digital Game-Based Learning (DGBL) has emerged as an effective pedagogical approach that integrates game elements into instructional practices to improve learning engagement and outcomes. One of the widely used platforms is Wordwall, an interactive learning tool that allows teachers to design various game-based grammar activities (Huynh, 2026; Ayyub et al., 2025; Rahimah, 2025). Wordwall incorporates features such as instant feedback, competition, and visual stimulation, which have been shown to increase student motivation and attention (Kapp, 2012). In addition, Batubara (2021) states that digital learning tools are highly suitable for digital-native learners, as they provide more dynamic and participatory learning experiences.

Unlike platforms such as Quizizz and Kahoot that primarily focus on multiple-choice competition formats, Wordwall offers a wider variety of activity types, including matching exercises, sentence completion, error correction, and rearrangement tasks (Rahimah, 2025; Ibrahim, 2025). These variations enable learners to actively manipulate grammatical structures rather than merely recognize correct answers. This characteristic is particularly relevant for mastering English tenses, which require repetitive practice and contextual application (Ndayiragije et al., 2025; Ihsani et al., 2025; Embagama, 2023).

Although previous studies have examined the effectiveness of Wordwall in language learning, most of them focus on vocabulary acquisition or general language skills. For instance, Sakkir,

Azis, and Jabu (2023) found that Wordwall significantly improved students' vocabulary mastery in an EFL classroom. However, their study employed a pre-experimental design and did not specifically investigate grammar mastery, particularly English tenses, nor did it examine comparative learning outcomes in a controlled experimental setting.

Therefore, there remains a clear research gap in the literature, as limited empirical studies have specifically investigated the effectiveness of Wordwall-based Digital Game-Based Learning in improving students' mastery of English tenses using a quasi-experimental design within the Indonesian EFL context.

This study aims to fill this gap by examining the effectiveness of Digital Game-Based Learning (DGBL) using Wordwall in improving students' grammar mastery, specifically English tenses, in a senior high school context. It also compares the learning outcomes between students taught using Wordwall-based DGBL and those taught using conventional teaching methods. The research questions guiding this study are whether there is a significant difference in students' English tense mastery between the two groups and how effective Wordwall-based DGBL is in improving students' grammar achievement.

It is hypothesized that there is a significant difference in students' English tense mastery between those taught using Wordwall-based Digital Game-Based Learning and those taught using conventional teaching methods, with the experimental group expected to achieve higher learning outcomes.

Methods

This study used quantitative research with a quasi-experimental design with a non-equivalent control group. The method was implemented to analyze the effectiveness of Digital Game Based Learning (DGBL) application with Wordwall in improving the present tense mastery of the English grammar skill of the students in comparison to conventional learning.

This research was carried out in SMA Kristen Elim Makassar, class 10th grade 2025/2026. A total of 80 students formed the population and two complete classes were randomly drawn from the population, with cluster random sampling. The experimental group consisted of Class X B having 27 students, where as the control group consisted of Class X A having 27 students. To minimize instructional variation, all of the students were instructed by a common teacher.

The experimental participants were provided with grammar instruction using Digital Game Based Learning (DGBL) via Wordwall, while the control participants were given conventional grammar instruction from the lecturer. Both groups learned the same material in which the four present tenses were the main point; simple present tense, present continuous tense, present perfect tense and present perfect continuous tense. The treatment went on for four instructional meetings and a post-test was used to assess treatment effects.

A grammar test, a questionnaire and a semi-structured interview were used for the collection of data. There were 29 multiple-choice grammar items which were used as pre test, post test to determine students' grammar achievement before and after the treatment. The questionnaire was used to measure the learning motivation of students using Wordwall, which had 22 items that were measured using the likert scale. Furthermore, a total of six students were randomly selected from the experimental group for semi-structured interviews to obtain deeper insights into the learning experiences and motivation of these students.

Data analysis performed in this study was descriptive and inferential statistics. Descriptive statistics were made and mean, SD, min and max were calculated. Data were analyzed inferentially by Shapiro Wilk test for normal distribution and then independent sample t-test or

Mann Whitney U test was used, depending on the data distribution. To evaluate the extent of the treatment effect, "effect size analysis" was conducted and to measure the improvement in students, "N-Gain score" was calculated. Descriptive analysis was employed for analysing the data from the questionnaire while thematic analysis was used to analyse the data from the interview. The finding's credibility and validity was ensured by using methodological triangulation.

Results and Discussion

The findings of this study are presented according to the two research questions. The first section reports the findings related to students' English tense mastery based on the grammar test, including descriptive statistics, assumption testing, inferential statistical analyses, N-Gain, and effect size. The second section presents the findings on students' learning motivation obtained from the questionnaire and semi-structured interviews. This organization ensures that the results are presented systematically and consistently with the research methodology employed in this study.

The use of Worwall significantly improves students' mastery of English tenses.

The grammar test data obtained from both the experimental and control groups were analyzed using descriptive and inferential statistical procedures. The analysis included the calculation of mean scores, followed by the normality test, the Wilcoxon Signed-Rank Test, the Mann Whitney U Test, the N-Gain score, and effect size analysis. The results of these analyses are presented in the following sections.

Descriptive Statistic

The grammar test was administered to both the experimental and control classes in the form of a pre-test and a post-test. The purpose of this test was to measure students' improvement in mastering present tenses after the implementation of the teaching strategies.

Table 1. Mean Scores of Pretest and Posttest

Class	Pretest mean	Posttest mean	Gain score
Control	38.81	78.66	39.85
Experimental	35.75	90.66	54.66

The table above presents the mean scores of the pretest and posttest in both the experimental and control classes. In the experimental class, the mean score increased from 35.75 in the pretest to 90.66 in the posttest, resulting in a gain score of 54.66. Meanwhile, in the control class, the mean score improved from 38.81 in the pretest to 78.66 in the posttest, with a gain score of 39.85.

These results indicate that both groups experienced improvement in their grammar achievement after the learning process. However, the experimental class showed a higher increase compared to the control class. This suggests that the use of Wordwall in teaching present tenses contributed to a greater improvement in students' grammar performance compared to the lecture teaching method.

Normality Test

The normality test was conducted to determine whether the data were normally distributed before performing further statistical analysis. In this study, the Shapiro Wilk test was used because the sample size of each group was less than 50. The results of the normality test are presented as follows:

Table 2. The Normality Test Result

Tests of Normality							
	Class	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Learning outcomes	Experimental class pretest	.136	27	.200*	.965	27	.480
	Experimental class posttest	.298	27	<.001	.776	27	<.001
	Control class pretest	.141	27	.182	.947	27	.179
	Control class posttest	.189	27	.015	.937	27	.103
*. This is a lower bound of the true significance.							
a. Lilliefors Significance Correction							

Based on the results of the Shapiro Wilk test, the pretest scores of both the experimental class (0.480) and the control class (0.179) were greater than 0.05, indicating that these data were normally distributed. Similarly, the posttest scores of the control class (0.103) also exceeded 0.05, suggesting a normal distribution.

However, the posttest scores of the experimental class showed a significance value of less than 0.001, which is below 0.05, indicating that the data were not normally distributed. Therefore, it can be concluded that while most of the data were normally distributed, one dataset (posttest of the experimental class) did not meet the assumption of normality. As a result, non-parametric statistical tests were employed for hypothesis testing in this study.

Hypothesis testing

Hypothesis testing was conducted to determine whether there were significant differences in students' learning outcomes both within each group and between the experimental and control classes. This analysis aimed to evaluate the effectiveness of the treatment applied in the experimental class compared to the conventional instruction used in the control class.

Since the results of the normality test indicated that not all data were normally distributed, the assumption for parametric tests was not fully met. Therefore, non-parametric statistical tests were employed in this study. Specifically, the Wilcoxon Signed-Rank Test was used to analyze the differences between pretest and posttest scores within each group, while the Mann Whitney U Test was used to examine the differences in posttest scores between the experimental and control classes.

The hypothesis testing in this study was conducted at a significance level of 0.05. The decision criteria were as follows: if the significance value (Sig.) is less than 0.05, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is accepted, indicating a significant difference. Conversely, if the significance value is greater than 0.05, the null hypothesis is accepted, indicating no significant difference.

Wilcoxon Signed-Rank Test for Experimental Class

To determine whether there was a significant difference in students' learning outcomes before and after the treatment in the experimental class, a Wilcoxon Signed-Rank Test was conducted. This test was chosen because the data were not normally distributed, thus violating the assumption of parametric testing. The Wilcoxon Signed-Rank Test is a non-parametric

statistical test used to compare two related samples, namely the pretest and posttest scores of the experimental class.

Table 3. The Wilcoxon Test Result

Test Statistics ^a	
	Posttest Pretest experimental class
Z	-4.549 ^b
Asymp. Sig. (2-tailed)	<.001
a. Wilcoxon Signed Ranks Test	
b. Based on negative ranks.	

Based on the results of the Wilcoxon Signed-Rank Test for the experimental class, the Z value obtained was -4.549, with an Asymp. Sig. (2-tailed) value of < 0.001. Since the significance value is lower than the alpha level of 0.05 ($0.001 < 0.05$), it can be concluded that there is a statistically significant difference between the pretest and posttest scores in the experimental class.

This finding indicates that there was a significant improvement in students' learning outcomes after the treatment was applied in the experimental class. Therefore, it can be concluded that the treatment had a positive effect on students' learning achievement.

Wilcoxon Signed-Rank Test for the Control Class

To examine whether there was a significant difference between students' pretest and posttest scores in the control class, a Wilcoxon Signed-Rank Test was conducted. This non-parametric test was applied because the data did not meet the assumption of normality required for parametric tests. The Wilcoxon Signed-Rank Test is used to analyze differences between two related samples, in this case, the pretest and posttest scores of the control class.

Table 4 Wilcoxon Signed-Rank Test

Test Statistics ^a	
	posttest controlclass - pretest controlclass
Z	-4.544 ^b
Asymp. Sig. (2-tailed)	<.001
a. Wilcoxon Signed Ranks Test	
b. Based on negative ranks.	

Based on the results of the Wilcoxon Signed-Rank Test for the control class, the Z value obtained was -4.544, with an Asymp. Sig. (2-tailed) value of < 0.001. Since the significance value is lower than 0.05 ($0.001 < 0.05$), it can be concluded that there is a statistically significant difference between the pretest and posttest scores in the control class.

This result indicates that there was also a significant improvement in students' learning outcomes in the control class, although the improvement may be influenced by conventional instruction or other external factors without the experimental treatment. Therefore, it can be inferred that learning occurred in both classes, but further analysis is required to determine the comparative effectiveness of the treatment.

Hypothesis Testing (Mann Whitney U Test)

To determine whether there was a significant difference in students' learning outcomes between the experimental class and the control class, a Mann Whitney U Test was conducted. This non-parametric test was used because the data were not normally distributed. The Mann

Whitney U Test is applied to compare two independent groups, namely the posttest scores of the experimental class and the control class, in order to examine the effectiveness of the treatment.

Table 5 Mann Whitney U Test Results

Test Statistics ^a	
	Result
Mann-Whitney U	79.000
Wilcoxon W	457.000
Z	-5.003
Asymp. Sig. (2-tailed)	<.001
a. Grouping Variable: Class	

Based on the results of the Mann Whitney U Test, the Mann Whitney U value obtained was 79.000, with a Z value of -5.003 and an Asymp. Sig. (2-tailed) value of < 0.001. Since the significance value is lower than the alpha level of 0.05 ($0.001 < 0.05$), it can be concluded that there is a statistically significant difference between the posttest scores of the experimental class and the control class.

This finding indicates that the experimental class performed significantly better than the control class after the treatment was applied. Therefore, it can be inferred that the instructional treatment used in the experimental class was more effective in improving students' learning outcomes compared to the conventional teaching method used in the control class.

Effect Size

To determine the magnitude of the treatment effect, an effect size analysis was conducted using the formula: Based on the Mann Whitney U test results, the Z value was -5.003, and the total number of participants was 54. The calculation is as follows:

$$r = \frac{Z}{\sqrt{N}}$$

$$r = \frac{-5.003}{\sqrt{54}} = -0.68$$

The absolute value of r is 0.68. According to Cohen's criteria, this value indicates a large effect size. This result suggests that the treatment applied in the experimental class had a strong and substantial impact on students' learning outcomes compared to the control class. Therefore, the effectiveness of the instructional method used in the experimental class is not only statistically significant but also practically meaningful.

Calculating the N-Gain Score

To determine the improvement of students' mastery from pre-test to post-test, the normalized gain (N-Gain) was calculated. N-Gain is used to measure the effectiveness of the treatment by identifying the extent of students' learning improvement. The formula of N-Gain is as follows:

$$N - \text{Gain} = \frac{\text{Posttest} - \text{Pretest}}{\text{Maximum score} - \text{pretest}}$$

Experimental class :

Control class :
$$g = \frac{78.66 - 38.81}{100 - 38.81} = \frac{39.85}{61.19} = 0.65 \text{ } 0.85$$

Table 6 N-Gain Result

Class	N-Gain	Category
Experimental	0.85	High
Control	0.65	Moderate

The results showed that the experimental class obtained an N-Gain score of 0.85, which is categorized as high improvement, while the control class obtained an N-Gain score of 0.65, which falls into the moderate improvement category.

These findings indicate that although both classes experienced improvement, the experimental class demonstrated a substantially higher level of learning gain. This result further confirms that the treatment applied in the experimental class was more effective in enhancing students' learning outcomes compared to the control class.

The use of Wordwall influences students' motivation to learn English tenses.

To answer the second research question, which examines how the use of Wordwall influences students' motivation to learn English tenses, the researcher collected data using a questionnaire and semi-structured interviews. These instruments were used to identify students' level of motivation and to gain deeper insights into their learning experiences after the implementation of Digital Game-Based Learning.

Questionnaire

The questionnaire was administered to the students in the experimental class after the implementation of Wordwall in learning present tenses. The purpose of this questionnaire was to identify students' responses and motivation toward the use of Wordwall as a learning medium.

Table 7 The Mean Score of the Questionnaire

Description	Score
Mean total score	86.33
Mean score	3.92
Category	High

Based on the results presented in the table above, the mean total score of the questionnaire was 86.33, while the mean score was 3.92. This score falls into the high category, indicating that students had positive responses toward the use of Wordwall in learning present tenses.

This finding suggests that the majority of students agreed that Wordwall was an effective and engaging learning medium. The high mean score reflects that students felt more interested and motivated during the learning process. The use of interactive features in Wordwall likely contributed to creating a more enjoyable and dynamic classroom environment.

Furthermore, the positive responses from students indicate that Wordwall not only enhanced their learning experience but also encouraged active participation. Students tended to be more involved and enthusiastic when learning through interactive activities compared to traditional methods.

These findings are consistent with the results of the grammar test, where the experimental class showed greater improvement compared to the control class. This indicates that students' positive responses toward Wordwall were aligned with their improved performance in mastering present tenses.

Interview

The interviews were conducted to obtain deeper insights into students' experiences and perceptions after the implementation of Wordwall in learning English tenses. Six students from the experimental class were randomly selected to be interviewed. The interviews aimed to explore students' responses to the learning process, particularly in terms of their engagement, interest, and motivation.

Theme 1: Increased Engagement and Interest

The interview results revealed that the use of Wordwall increased students' engagement and interest during the learning process. Most students reported that learning through games was more enjoyable compared to conventional methods such as lecturing and written exercises. The following extracts illustrate students' responses:

Extract 1: (INT/S2, May 2026)

When using the lecture method, I feel bored and find it difficult to focus. However, when using games like Wordwall, it becomes more interesting and enjoyable, so I can stay focused longer”

Extract 2: (INT/S3, May 2026)

“It feels better and not boring. I understand more quickly because learning through games makes it more relaxed”

Extract 3: (INT/S4, May 2026)

“At first, I felt unsure, but after using Wordwall, it became more enjoyable and easier to focus.”

These findings can be interpreted through the framework of Self-Determination Theory, particularly in relation to the dimensions of autonomy and competence. The element of autonomy is reflected in students' perception of learning as more enjoyable and less monotonous, suggesting that they experienced a more comfortable and self-directed learning atmosphere. This condition is closely related to increased interest, as students tend to engage more actively in activities they perceive as enjoyable.

In addition, the sense of competence is indicated by students' statements that they could understand the material more easily during game-based learning. This perception may support their confidence in completing learning tasks, which in turn contributes to sustained attention and engagement during the lesson.

In this context, the use of Wordwall appears to provide learning conditions that align with students' psychological needs, particularly in terms of enjoyment and perceived understanding. These conditions tend to be associated with higher levels of engagement and interest, as reflected in students' ability to maintain focus and participate more actively in the learning process.

Theme 2: Autonomous learning and improved understanding

The interview results also revealed that the use of Wordwall supported students' autonomous learning and improved their understanding of English tenses. This finding is supported by the

interview data, which show that students were able to learn independently, repeat the exercises, and better understand the material through interactive activities. The following extracts illustrate students' responses:

Extract 1: (INT/S1, May 2026)

"In my opinion, Wordwall helps me learn independently because I can access it anywhere, even at home. So I can repeat the exercises until I truly understand."

Extract 2: (INT/S3, May 2026)

"I can learn on my own without always waiting for the teacher's explanation because Wordwall directly shows which answers are correct and incorrect."

Extract 3: (INT/S5, May 2026)

"When I make a mistake, I immediately know where it is, so I can fix it and better understand the tenses."

These findings can be interpreted through the framework of Self-Determination Theory, particularly in relation to the dimensions of autonomy and competence. The element of autonomy is strongly reflected in students' ability to access the learning platform independently and regulate their own learning pace, as indicated by their practice of repeating exercises until they understood the material. This suggests that the learning environment allowed students to take greater control over their learning process.

In addition, the sense of competence is reflected in students' responses regarding the immediate indication of correct and incorrect answers. Although the feedback provided is limited to identifying whether responses are right or wrong, it appears to help students recognize their mistakes and attempt corrections through repeated practice. This process may support their awareness of learning progress and contribute to their perceived understanding of the material.

In this context, the use of Wordwall appears to provide learning conditions that facilitate independent learning and support students' perceived understanding of the material. These conditions tend to be associated with the development of autonomous learning behaviors and a clearer grasp of English tenses.

Theme 3: Increase motivation and confidence

The interview results further revealed that the use of Wordwall increased students' learning motivation and confidence in learning English tenses. This finding is supported by the interview data, which show that students felt more enthusiastic, motivated, and confident when participating in game-based learning activities. The following extracts illustrate students' responses:

Extract 1: (INT/S2, May 2026)

"I feel more motivated to learn because there are challenges and it feels like competing with my classmates"

Extract 2: (INT/S4, May 2026)

"I feel more confident in answering questions because I have practiced frequently through the games."

Extract 3: (INT/S6, May 2026)

“Learning becomes less stressful, so I feel more confident to try even if I might make mistakes.”

From a theoretical perspective, these findings can be related to the framework of Self-Determination Theory, particularly in terms of the dimensions of competence and relatedness. The sense of competence is reflected in students' increased confidence after repeated practice, which may help them feel more capable of completing learning tasks. In addition, the element of relatedness is suggested by students' references to challenge and competition with peers, which may create a more socially engaging learning atmosphere.

Furthermore, the game-based features of Wordwall, such as challenges and competition, appear to contribute to students' enthusiasm during the learning process. At the same time, the relatively low-pressure learning environment may help reduce feelings of anxiety, allowing students to participate more actively and take risks in answering questions.

Overall, the findings suggest that the use of Wordwall tends to be associated with positive motivational responses and increased confidence in learning. These conditions may support students' willingness to engage in learning activities and practice using the target language.

The findings from the interviews also provide qualitative support for the quantitative results obtained from the grammar test and questionnaire. The consistency between these data sources indicates a convergence of findings, which strengthens the interpretation of the results through methodological triangulation. However, these results should be understood as indicative rather than conclusive, particularly in relation to students' motivation.

The Effect of Digital Game-Based Learning through Wordwall on Students' Mastery of English Tenses

The findings of this study indicate that the implementation of Digital Game-Based Learning (DGBL) through Wordwall resulted in greater improvement in students' mastery of English tenses than conventional instruction. Although both the experimental and control groups demonstrated learning progress after the instructional treatment, the experimental group achieved substantially higher learning gains. These findings suggest that integrating structured game-based activities into grammar instruction provides more effective learning opportunities than teacher-centered instruction alone.

The superior performance of the experimental group may be explained by the complementary pedagogical functions of the two Wordwall activities employed in this study, namely Unjumble and Maze Chase. Rather than functioning merely as entertaining digital games, each activity engaged students in different cognitive processes involved in grammar learning. Unjumble required students to reconstruct sentences by arranging words into grammatically correct structures. This activity encouraged learners to actively analyze grammatical relationships among sentence components, including subject-verb agreement, auxiliary selection, and tense formation. Such active manipulation of linguistic elements is consistent with Constructivist Learning Theory (Piaget, 1970; Vygotsky, 1978), which proposes that knowledge is developed through learners' active engagement in constructing meaning rather than passively receiving information. Repeated sentence reconstruction therefore may have enabled students to internalize grammatical patterns more effectively than simply memorizing tense formulas.

In contrast, Maze Chase emphasized rapid recognition and retrieval of correct grammatical forms under time-limited conditions. Students were required to identify appropriate tense

forms while responding quickly to game stimuli, encouraging repeated retrieval of previously learned knowledge. According to Digital Game-Based Learning theory (Prensky, 2007; Kapp, 2012), repeated practice, immediate feedback, and continuous interaction strengthen learning by reinforcing knowledge and maintaining learner engagement. The immediate corrective feedback provided during gameplay also allowed students to recognize and correct grammatical errors instantly, thereby reducing misconceptions before they became firmly established.

Importantly, the combination of these two game mechanics appears to have produced a balanced learning experience. While Unjumble primarily supported deeper understanding of sentence construction, Maze Chase reinforced grammatical recognition, retrieval speed, and response accuracy. This complementary instructional design may explain why students receiving Wordwall instruction demonstrated higher mastery of English tenses than those who learned through explanation and written exercises alone. The findings therefore suggest that the effectiveness of Wordwall lies not merely in its digital format but in the pedagogical functions embedded within different game mechanics that facilitate multiple aspects of grammar acquisition.

These findings are consistent with previous studies reporting that Digital Game-Based Learning promotes grammar achievement and classroom engagement (Özer & Çavuş, 2024; Susanti et al., 2024; Zuhri et al., 2025). However, the present study extends previous research by demonstrating that different Wordwall game formats contribute to different cognitive dimensions of grammar learning. Rather than evaluating Wordwall as a single instructional platform, this study shows that specific game mechanics can be strategically selected to facilitate sentence construction, grammatical recognition, and repeated practice according to particular instructional objectives.

The Influence of Wordwall on Students' Learning Motivation

Besides improving students' mastery of English tenses, the findings also indicate that learners demonstrated a high level of learning motivation after participating in Digital Game-Based Learning through Wordwall. Since motivation was measured only after the instructional treatment, the findings should be interpreted as describing students' motivational responses toward the learning experience rather than changes in motivation over time.

The questionnaire findings, supported by interview data, indicate that students perceived the learning activities as enjoyable, engaging, and encouraging. Students reported that learning English tenses through Wordwall reduced boredom, increased classroom participation, and maintained their attention throughout the instructional process. Interview responses further revealed that many students felt more confident in answering grammar questions after repeatedly practicing through the games, suggesting that interactive digital activities created a more positive learning experience.

These findings can be interpreted through Self-Determination Theory (Deci & Ryan, 2000), which proposes that students become more motivated when learning environments support their psychological needs for competence, autonomy, and meaningful engagement. In this study, students experienced competence through repeated successful completion of learning tasks accompanied by immediate feedback, enabling them to monitor their own progress and recognize grammatical improvement. At the same time, the interactive nature of the activities encouraged active participation instead of passive listening, allowing students to become more involved in the learning process.

Furthermore, the motivational findings are consistent with Malone and Lepper's (1987) framework of intrinsic motivation, which emphasizes challenge, curiosity, enjoyment, and immediate feedback as important characteristics of motivating learning environments. The combination of these elements within Wordwall appears to have transformed grammar learning from a rule-based activity into a more interactive learning experience that sustained students' interest throughout the instructional sessions.

Compared with the experimental class, students receiving conventional instruction had fewer opportunities to participate actively in learning activities. Although conventional instruction enabled students to understand grammatical concepts through explanation and guided exercises, the absence of interactive game elements may have limited students' engagement and reduced opportunities for immediate feedback. This difference in instructional experience may partially explain why students exposed to Wordwall demonstrated more positive attitudes toward learning English tenses.

Contribution to Previous Studies

The results presented in the present study generally corroborated the previous study that has shown the effectiveness of the Digital Game-Based Learning approach on improving the English language learning outcomes. The scholars have found that the digital educational games provide students with an interactive learning environment, which encourages students to be active learners and has a positive impact on students' achievement, engagement, and motivation in educational activities (Özer & Çavuş, 2024; Rosli et al., 2022; Li et al., 2024). This study's results support this body of evidence and demonstrate that there is also a strong possibility that Wordwall based teaching and learning can help students master English grammar.

However, this study adds a few more points of view to the current body of research. Firstly, previous research has often focused on the use of Wordwall or Digital Game-Based Learning in general English language skills, while the present study focuses on the mastery of the four present tenses in English. This focus on instruction is more specific, offering a detailed account of how game-based learning can be used in the learning of grammar.

Secondly, this study reveals that game mechanics with the same function in the same game platform can serve different pedagogical purposes. The results indicate that Unjumble supports the construction of sentences and provides support for the understanding of sentence structure, while Maze Chase reinforces grammatical recognition and provides prompt feedback and repeated retrieval. This distinction adds a more complex perspective on the role of Digital Game Based Learning in the acquisition of grammar, instead of considering the use of educational games as the only form of learning.

Last but not least, the use of quasi-experimental design with statistical analysis, questionnaire results, and interview results is a supplemental quantitative and qualitative evidence of how effective Wordwall is in teaching English grammar. Combined, these results reinforce the previous evidence that the well-designed DGBL activities could help students in both grammatical development and improve the classroom learning experience.

Pedagogical Implications

The results of this study do have several implications for English language teaching. Teachers can choose other game mechanics based on their instruction goals instead of just using Wordwall as another form of digital assessment and/or classroom entertainment. Activities such as Unjumble can be used for supporting students in their consolidation of grammatical structures by reconstructing sentences, while Maze Chase can be used for supporting students

to ensure grammatical accuracy and retrieval by constantly repeating the grammatical structures in an interactive manner.

The results indicated that Digital Game-Based Learning could be used as an auxiliary learning method in grammar learning. Mixing the various types of games with clear explanations could offer students possibilities for deeper learning of the grammar, instant feedback, and staying active during the learning process. This means that Digital Game Based Learning can help enhance students' proficiency in learning English tenses, but also can help to build a motivating and learner-centered classroom.

Conclusion

In conclusion, this research shows digital game-based learning using Wordwall is effective in supporting 10th-grade students' achievement of the use of the present tenses in the English language: simple present, present continuous, present perfect, and present perfect continuous. The statistical analysis showed that the experimental group had a significant difference from the conventional class group and the experimental group showed more improvement than the conventional group. The N-gain analysis and large effect size indicates that the experimental group gained more as a result of the instructional process however, both groups made progress. From the findings, it can be concluded that the use of interactive digital game-based activities can give meaningful support to the learning of grammar, especially in helping students to understand and use the tense structure of the English language.

Moreover, the results show that the students' responses to the implementation of Wordwall in the learning English tenses were positive in terms of motivation. The questionnaire results indicated that there was high motivation of students following the intervention, and the interview responses indicated that the Wordwall activities were considered to be engaging, enjoyable and supportive of their involvement and confidence whilst learning. Thus, in this study, Digital Game-Based Learning using Wordwall was not only able to support students' cognitive development in the mastery of grammar but also in creating learning experiences for students.

Suggestion

The findings of this study provide pedagogical implications for English teachers, particularly in grammar instruction. Teachers are encouraged to integrate digital game-based platforms such as Wordwall as a complementary instructional approach to support interactive and student-centered learning environments. The use of game mechanics such as Unjumble and Maze Chase can be combined with explicit grammar explanations to facilitate sentence construction, accuracy, and active participation.

For students, active involvement in digital game-based learning activities is recommended as it may support the development of grammar knowledge through repeated practice, immediate feedback, and meaningful interaction with learning materials. Students are encouraged to utilize these opportunities to reflect on errors, improve their understanding of tense forms, and develop greater confidence in using English.

Future researchers are suggested to investigate the application of Digital Game-Based Learning across different educational contexts, language skills, and learner populations. Further studies may employ a pretest posttest design to examine changes in students' motivation more comprehensively and may combine quantitative and qualitative approaches to gain deeper insights into students' learning experiences. Research exploring other digital game mechanics or comparing different game-based platforms may also contribute to a broader understanding of technology-enhanced language learning.

Acknowledgment

First and foremost, the writer would like to express his deepest gratitude to Almighty God for His abundant grace, blessings, and guidance throughout the completion of this thesis. Without His divine providence, strength, and wisdom, this work would not have been possible.

The writer would also like to express his sincere and profound appreciation to his supervisors, Prof. Sultan Baa, S.S., M.Ed., Ph.D., as the first supervisor, and Prof. Dr. Abdullah, M.Hum., as the second supervisor, for their invaluable guidance, constructive feedback, continuous support, and patience throughout the research process. Their insightful suggestions and academic expertise have greatly contributed to the completion of this thesis.

Furthermore, the writer would like to extend sincere gratitude to all individuals and institutions who have contributed to the completion of this thesis, appreciation is addressed to:

1. Prof. Dr. Farida Patittingi, S.H., M.Hum., The Acting Rector of Universitas Negeri Makassar, for providing the opportunity to pursue higher education.
2. Prof. Dr. Anshari, M.Hum., The Dean of the Faculty of Languages and Literature, for administrative support and academic facilitation.
3. Prof. Iskandar, S.Pd., M.Ed., Ph.D., The Vice Dean for Academic Affairs of the Faculty of Languages and Literature, for academic guidance and constructive input during the completion of this study.
4. Dr. M. Tahir, S.Pd., M.Pd., M.Ed., EREA, The Head of the English Education Study Program, for guidance and support throughout the study.
5. Prof. Sultan Baa, S.S., M.Ed., Ph.D., as the first supervisor, for his guidance, motivation, and advice during the completion of this thesis.
6. Prof. Dr. Abdullah, M.Hum., as the second supervisor, for his guidance, motivation, and advice during the completion of this thesis.
7. Prof. Dr. Baso Jabu, M.Hum., The first examiner, for valuable evaluation, insightful feedback, and constructive suggestions that significantly improved the quality of this thesis.
8. Dr. Auliyanti Sahril Nurfadhilah, S.Pd., M.A., The second examiner, for valuable evaluation, insightful feedback, and constructive suggestions that significantly improved the quality of this thesis.
9. All lecturers of the English Education Study Program for their knowledge, guidance, and inspiration throughout the writer's academic journey.
10. The principal, English teacher, and students of SMA Kristen Elim Makassar for their cooperation and support during the research process.
11. The writer's beloved family for their endless love, prayers, encouragement, and moral support.
12. All friends and colleagues who have provided support, motivation, and assistance during the completion of this thesis.

The writer hopes that this thesis will be beneficial for readers, particularly those interested in English language teaching and learning. The writer also acknowledges that this thesis is still far from perfect; therefore, constructive criticism and suggestions are highly appreciated for future improvement.

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