





The Effects of Wordwall Games on EFL Learners' Vocabulary Acquisition at A High School in Vietnam

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ABSTRACT

In the context of globalization, English serves as a lingua franca, and vocabulary acquisition plays a crucial role in language learning and effective communication. In Vietnam, despite the advancement of educational technology, the application of digital tools in vocabulary teaching at the secondary school level still faces certain limitations. This action study was conducted on 40 11th-grade students at a public high school to assess the impact of digital game-based learning on vocabulary acquisition. Through data analysis from questionnaires, classroom observations, and teacher self-reflection journals, the findings indicated that integrating Wordwall games into English lessons positively influenced students' motivation, engagement, and vocabulary acquisition. Classroom participation was consistently higher in Wordwall-based lessons than in comparable non-digital activities. Most students also demonstrated a clear preference for digital games. Insights from the researcher's reflection journals, together with the findings from Wordwall-based activities and EVP analysis, suggested noticeable improvement in students' vocabulary acquisition across the intervention cycles, particularly in vocabulary recall and their ability to use a wider range of lexical items. The study confirms the pedagogical potential of digital games in optimizing language development for EFL students in Vietnam.

Keywords: digital game-based learning, EFL learners, high school students, vocabulary acquisition, Wordwall games

INTRODUCTION

Vocabulary acquisition is a prerequisite for achieving fluency in English (Indriani et al., 2023). However, learners still face many barriers in memorizing and using vocabulary effectively (Wahyuningsih et al., 2023; Webb & Nation, 2017). Studies show that gaps in long-term information retention often stem from a lack of proactive learning strategies, limited opportunities for practice in real-world contexts, and insufficient repetition to

reinforce knowledge (Gu, 2003; Schmitt & Schmitt, 2020). As a result, learners' vocabulary often remains at the level of superficial recognition, directly hindering fluency and overall language development (Laufer & Nation, 2013; Webb, 2008). Conversely, a rich vocabulary not only promotes language acquisition but also forms the foundation for outstanding academic achievement (Arochman et al., 2023).

In response to these challenges, integrating technology into vocabulary teaching is becoming an inevitable trend because of its ability to improve interaction and learning effectiveness (Saari & Varjonen, 2021; Wu et al., 2020). Among these platforms, Wordwall.net is widely recognized as an effective tool, promoting learner engagement through diverse interactive games such as quizzes, matching, and group exercises (Rodriguez-Escobar et al., 2023). Characterized by game-based learning, Wordwall realizes the principles of constructivist theory by creating an active, interactive environment, providing immediate feedback and meaningful repetition - key elements for transferring vocabulary into long-term memory.

In Vietnam, the 2018 General Education English Language Curriculum (Minister of Education and Training [MoET], 2018a) mandates that high school students should achieve Level 3 proficiency in the national six-level framework by the end of upper secondary education. Additionally, the Ministry of Education and Training encourages that at least 15% of classroom instruction integrates digital technology (MoET, 2018b). These policy directives urge teachers to diversify their teaching strategies and adopt more appropriate digital tools to enhance student learning outcomes. Although game-based learning has shown promise in enhancing vocabulary, most current research focuses only on test scores and immediate results. Very few studies examine how learners perceive the experience or compare game-based learning to traditional (non-digital) games, especially in the context of learning English as a foreign language in Vietnamese high schools. This study aims to fill that gap by examining not only learning outcomes but also learner perceptions, and by directly comparing non-digital and digital game-based learning methods. Therefore, the principal objectives of this study are: (1) to investigate high school EFL learners' perceptions of using Wordwall games in English classes; and (2) to examine the effects of utilizing Wordwall games on their vocabulary acquisition.

LITERATURE REVIEW

Vocabulary Acquisition

Vocabulary acquisition is an ongoing and complex process, requiring learners to constantly expose to and use vocabulary in meaningful contexts (Jiang et al., 2023; Schmitt & Schmitt, 2020). This process involves perception, motivation, and context, which determine how learners store and use vocabulary (García, 2024). Simultaneously, both incidental and intentional learning should be considered. Incidental learning occurs through reading or interaction, where learners receive rich contextual input, while intentional learning focuses on specific tasks or vocabulary lists, providing more immediate benefits (Zwier & Boers, 2022). Combining these two forms helps with long-term retention.

Vocabulary competence encompasses both receptive (recognition) and productive (use) abilities, with receptive ability often being dominant (Nation, 2014). Productive ability requires deeper processing and repeated exposure (approximately 6-16 times) along with communicative activities such as storytelling or games to transform passive learning into active learning (Schmitt & Carter, 2000; Ur, 2022). Sonbul & Schmitt (2010) believed reusing words in different contexts helps consolidate memory.

Furthermore, vocabulary and classroom participation have a two-way relationship: a rich vocabulary promotes understanding, communication, and confidence, while active participation strengthens vocabulary (Stæhr, 2008; Webb & Nation, 2017). Learners with rich vocabulary are more likely to employ effective strategies and demonstrate persistence (Schmitt et al., 2020; Teng, 2019). Therefore, participatory behaviors such as speaking and cooperating are true indicators of vocabulary development (TextInspector, 2022).

Game-Based Learning and Its Role in Vocabulary Acquisition

Game-Based Learning (GBL) is the systematic application of game principles, mechanisms, and environments to enhance motivation, engagement, and learning outcomes (Ghazy et al., 2021). Based on constructivist theory, GBL encourages learners to construct knowledge through experience and social interaction (Gee, 2003). Non-digital games such as Slap the Board or Hangman have been widely used in EFL classrooms to promote engagement, especially among younger or lower-level learners (Bin-Hady, 2021). However, they are limited by their fixed nature, lack of immediate feedback, few multimodal elements, and the “disengagement effect” (Ning et al., 2021; Philominraj et al., 2017; Wright et al., 2006).

Conversely, Digital Game-Based Language Learning (DGBLL) combines technology with GBL principles, providing interactive, adaptive, and multimedia experiences (Ho et al., 2022). Digital games also offer instant feedback, increased challenge levels, and personalized content, thereby enhancing motivation, retention, and cognitive engagement (Clark et al., 2023; Saari & Varjonen, 2021). Aligned with the characteristics of the “digital generation” (Bennett et al., 2008), DGBLL fosters student independence and multisensory growth by engaging them in creative, multimedia-rich activities (Chen, 2023; Zou et al., 2021).

Research has shown that vocabulary games with instant recall and feedback mechanisms optimize learning, outperforming traditional methods (Babazade, 2024; Wu et al., 2020). Among online platforms, Wordwall.net stands out as an effective vocabulary learning tool, creating a vibrant and engaging learning environment (Moorhouse & Kohnke, 2024; Rodriguez-Escobar et al., 2023; Syamsidar et al., 2023). Activities such as matching, visual association, quizzes, or lucky spins can both stimulate interest and cater to various learning styles, making vocabulary learning meaningful and sustainable (Çil, 2021).

Previous Research on Wordwall Games

International studies have demonstrated the effectiveness of Wordwall games in supporting vocabulary learning. These studies commonly conclude that learners find these games enjoyable, engaging, and highly motivating, primarily due to the benefits of competition and immediate feedback. Furthermore, this interactive platform can help enhance vocabulary acquisition in EFL learners (Makrub, 2023; Shabrina & Taufiq, 2023; Widyaningsih et al., 2023). In the Vietnamese context, several studies have also reported that Wordwall games positively influence students' vocabulary retention and learning motivation, improving word recall and increasing learning interest (Thu & The, 2024). In addition, Minh and Nguyen (2024) confirmed in their study that integrating Wordwall games into vocabulary lessons can improve learners' vocabulary acquisition and provide a positive learning experience.

In general, most studies focus on individual vocabulary lessons rather than integrating Wordwall into daily English classes, while vocabulary acquisition requires repetition and diverse contexts. Moreover, few studies examine the perspectives of high school students or compare the effectiveness of Wordwall to traditional (non-digital) classroom games. To bridge the existing gap, the present study adopted a two-phase action research design (pre-intervention and intervention) to compare digital and non-digital games and explore the impact of Wordwall on students' vocabulary acquisition and overall learning experience.

THEORETICAL FRAMEWORK

This study is guided by Engagement Theory (Kearsley & Shneiderman, 1998), which emphasizes that learning is most effective when it there is collaboration, interaction, and related tasks. This study further this concept by framing engagement as a complex construct that encompasses behavior, cognitive, and emotional involvement (Zhang et al., 2023).

This theory serves as the pedagogical foundation for the Wordwall intervention, creating an environment where students deeply engage with vocabulary. Games are designed to stimulate critical thinking and self-reflection in both individual and group settings. Accordingly, the research methodology uses observation and surveys to target specific indicators of engagement and motivation. By aligning instructional practices with Engagement Theory, this study explores how digital game-based learning can support vocabulary acquisition in EFL classrooms through sustained learner engagement

RESEARCH METHODOLOGY

Research Design

Following the action research models proposed by Kemmis (2021) and Burns (2011), this research utilized a pre-intervention phase and an intervention phase. The intervention was organized into two cycles, each following a systematic sequence of planning, action, observation, and reflection. This action research was conducted to address a practical problem in the classroom: the limited vocabulary knowledge and low student engagement in traditional vocabulary learning activities. Despite frequent vocabulary instruction, many students show passive participation and struggle to recall and use target words effectively. This pedagogical issue prompted the researcher-teacher to search for alternative teaching methods through a systematic action research process.

During the Pre-intervention phase (in Unit 6 - Preserving our heritage), non-digital games (e.g., Hangman, Bingo, Slap the Board) were used in seven lessons of Unit 6 to create a benchmark. A 15-item closed-ended questionnaire was then distributed to students to collect their views on the use of these games in English lessons. Next, in Cycle 1 of the intervention phase (seven lessons of Unit 7 - Education options for school leavers), Wordwall games were integrated into seven lessons, with activities such as Matching, Open the Box, and Crossword. In Cycle 2 of the intervention phase (seven lessons of Unit 8 - Becoming independent), the Wordwall game continued, based on feedback from Cycle 1, but with improved activity design and pedagogical support.

After that, a similar closed-ended questionnaire, consisting of 15 items, was used to collect students' perspectives on the use of Wordwall games in English lessons. Classroom observations and reflection journals were maintained throughout two phases to record engagement and changes in learning. Data from the three sources (questionnaires, observations, and reflection journals) were triangulated to assess changes in students' vocabulary acquisition and engagement (see **Figure 1** and **Table 1**).

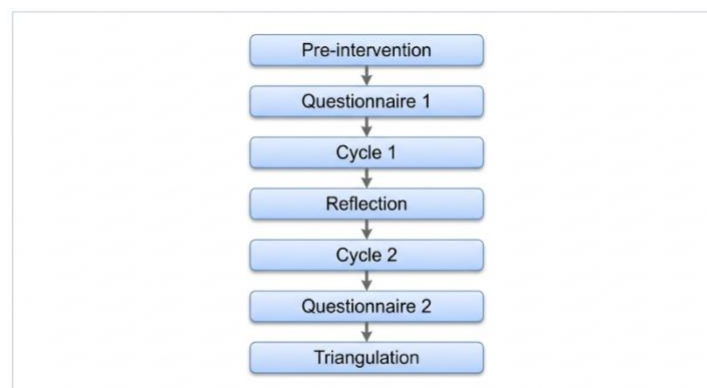


Figure 1. Action research procedure (Source: The authors)

Table 1. Overview of the intervention procedure

Phase	Unit / Topic	Duration	Type of Activities	Teacher's Role	Students' Activities	Data Collected
Pre-intervention	Unit 6 – <i>Preserving Our Heritage</i>	7 lessons (Weeks 1–2)	Non-digital vocabulary games (Hangman, Bingo, Slap the Board, Rob Out and Remember Kim's Game, Noughts & Crosses)	Introduced vocabulary, organized traditional games, monitored participation	Participated in vocabulary games, answered questions, practiced target vocabulary	Questionnaire, classroom observations, reflection journals
Intervention Cycle 1	Unit 7 – <i>Education Options for School Leavers</i>	7 lessons (Weeks 3–5)	Wordwall activities (Match Up, Open the Box, Crossword, Group sort, Anagram, Complete the Sentence)	Designed and facilitated Wordwall activities, provided instructions and feedback	Completed digital vocabulary tasks individually and in groups using smartphones	Questionnaire, classroom observations, reflection journals, Wordwall scores
Intervention Cycle 2	Unit 8 – <i>Becoming Independent</i>	7 lessons (Weeks 6–8)	Improved Wordwall activities with additional pedagogical support	Adjusted task design based on Cycle 1 reflections, monitored engagement and vocabulary use	Participated in revised digital activities, applied vocabulary in speaking and writing tasks	Questionnaire, classroom observations, reflection journals, Wordwall scores, lexical analysis

Research Setting and Participants

This study was conducted over eight weeks of the 2024–2025 academic year at a public high school in An Giang province, Vietnam, where 11th-grade students received three English lessons per week. The researcher was also the teacher, directly instructing the class using the textbook "Global Success". Because this environment is representative of a typical Vietnamese public high school, the findings hold practical value for similar educational contexts.

The participants were from a single class (11A-a Natural Science class), which consisted of 40 students (18 males and 22 females aged between 16 and 17). Most students came from middle-income families, a profile that is common among learners in public high schools in the local area. The class was selected through purposive sampling because students had comparable English learning backgrounds and remained available throughout the intervention period. All students had access to smartphones and internet connectivity, which made it feasible to integrate digital activities. Importantly, the majority of the students had never played Wordwall games before, which lessened bias and increased the reliability of their feedback.

Researcher's Role

This study was conducted using a teacher-as-researcher model, where the author directly assumed the role of teaching in the experimental classroom. This dual role facilitated the seamless integration of Wordwall-based activities into the main curriculum without disrupting the learning environment. The researcher was fully responsible for the entire process, from designing the digital tasks and implementing them to collecting qualitative and quantitative data. Direct field presence helped to understand the psychological characteristics

of the study subjects and allowed for detailed field observations throughout the intervention cycles. To minimize subjective bias from this dual role, data objectivity was ensured through triangulation (combining classroom observation results, feedback logs, and empirical data from student questionnaires).

Data Collection and Analysis

Before each lesson, the teacher-researcher established a target vocabulary list and selected supplementary activities corresponding to the pedagogical goals. In the Pre-intervention phase, students participated in traditional classroom games led directly by the teacher using board-based and paper-based activities. In the Intervention phase, students used smartphones to access Wordwall activities (such as Open the box or Anagram) individually or collaboratively in pairs and groups.

Throughout the lessons, the teacher monitored participation, provided instructional support when necessary, and encouraged students to apply target vocabulary in follow-up speaking and writing tasks. At the end of each lesson, classroom observations and teacher reflection journals were completed to document students' engagement and vocabulary performance. To ensure consistency and comparability, data collection tools (including student questionnaires, class observation lists, and teachers' self-reflection journals) were used consistently throughout both phases.

Questionnaire

The study used a 15-item questionnaire, adapted from Jannah and Syafryadin (2022), to assess students' perceptions, engagement levels, and learning experiences with vocabulary activities (non-digital and digital games) (Appendices 1A and 1B). The questionnaire items were rated on a 5-point Likert scale, from 1 (Strongly disagree) to 5 (Strongly agree). To ensure linguistic and cultural appropriateness, the tool was translated into Vietnamese and pilot tested on 30 students with similar characteristics. This process allowed for refinement of wording and removal of ambiguities. Besides, content validity was established through the review of two experienced ESL experts to ensure the questions aligned with the research objectives. The questionnaires were administered twice (before and after intervention) via Google Forms anonymously to minimize response bias. The collected data were processed using descriptive statistics, focusing on the (M) and standard deviation (SD). Means were interpreted according to the Boone and Boone (2012) frame of reference: 1.00-1.80 (Strongly disagree); 1.81-2.60 (Disagree); 2.61-3.40 (Neutral); 3.41-4.20 (Agree); and 4.21-5.00 (Strongly agree)

Observation

Classroom observation was conducted by the teacher-researcher throughout the pre-intervention and intervention phases to monitor students' behavioral, cognitive, and emotional engagement during vocabulary activities. Observation checklists were completed immediately after each lesson based on field notes recorded during classroom activities. Observations were carried out during all 21 lessons (seven lessons in the pre-intervention phase, seven lessons in Cycle 1, and seven lessons in Cycle 2), with each observation lasting for the full duration of the classroom lesson (approximately 45 minutes).

A structured observation checklist adapted from Rachmawati et al. (2020) was used during each lesson. The checklist consisted of ten engagement indicators covering the pre-, while-, and post-lesson stages. Each indicator was rated on a five-point scale from 0 to 4, where 0 indicated no student participation and 4 indicated participation by almost all students.

To improve consistency and reduce subjective bias associated with the teacher-researcher role, the same observation criteria and scoring procedures were applied across all lessons. Observation results were triangulated with questionnaire responses and teacher reflection journals to enhance the credibility of the findings.

Teacher's self-reflection journals and supplementary data

Teacher reflection journals were completed after each lesson during the pre-intervention and intervention phases, yielding 21 entries. Based on Simeon's (2014) reflection framework, the researchers carefully examined lesson outcomes, engagement levels, and the need for pedagogical changes. These journals were then analyzed thematically to identify core trends in student engagement. Additional data from the Wordwall platform, including task completion rates, scores, and time taken, were used for comparison. Furthermore, vocabulary profiles generated using Text Inspector were compared across the pre-intervention phase, Cycle 1, and Cycle 2. To ensure transparency regarding the data source, the vocabulary samples analyzed (**Supplementary 4**) were derived from six classroom-based language tasks performed in three phases: three speaking tasks (students describing topics from the Global Success textbook) and three writing tasks (a leaflet, a letter, and an article of 150-180 words). These exercises were conducted under regular classroom conditions to record authentic and typical language use.

Validity, Reliability, and Ethical Considerations

Validity of the study was strengthened through expert review of the instruments (two ESL teachers and a mentor). The face validity of the questionnaire was verified through pilot testing. Reliability was enhanced through the use of standardized observation criteria, consistent data collection procedures across all phases, and review of observation records by an experienced English teacher. Credibility was further ensured through data triangulation and lexical analysis. Ethical compliance was ensured through participant consent, protection of anonymity, and administrative approval. The low-risk nature of the study was maintained by combining all activities with regular classroom instruction.

FINDINGS

Questionnaire Results

As shown in **Table 2**, the mean scores for the non-digital games ranged from 2.60 to 3.25, indicating generally neutral perceptions and moderate engagement levels. In contrast, the Wordwall activities received substantially higher mean scores ranging from 4.15 to 4.58, reflecting positive student perceptions, stronger motivation, and higher engagement during vocabulary learning activities.

Table 2. Questionnaire Results

Items	Non-digital Games M (SD)	Wordwall Games M (SD)
1. I find the games exciting, interesting, motivating, and fun	3.17 (1.05)	4.58 (0.59)
2. I feel positive when playing the games	2.98 (0.88)	4.40 (0.66)
3. I like the collaboration and competitiveness in game sessions	3.00 (0.89)	4.22 (0.85)
4. I am motivated to win the game sessions	2.85 (0.79)	4.22 (0.82)
5. The games create an energetic classroom atmosphere	3.25 (1.18)	4.15 (0.88)
6. I look forward to playing the games	2.88 (0.98)	4.50 (0.59)
7. I am eager to learn via the games	2.67 (0.88)	4.50 (0.67)
8. I prepare vocabulary better to win the game sessions	2.62 (0.86)	4.20 (0.87)
9. I do not want to miss any game sessions	2.60 (0.80)	4.17 (0.86)
10. The games should be used in the daily learning process	2.95 (1.00)	4.35 (0.65)
11. I focus on the questions in each game session	2.90 (0.92)	4.42 (0.67)
12. I respond to each question in each game session	2.88 (0.90)	4.33 (0.65)
13. I respond as quickly as possible to each question	2.83 (0.89)	4.33 (0.69)
14. I respond as accurately as possible to each question	2.77 (0.88)	4.30 (0.68)
15. I pay more attention during lectures because I hope to win the game sessions	3.00 (0.95)	4.58 (0.49)
Overall	2.89 (0.54)	4.35 (0.47)

Moreover, the relatively low standard deviation values in the Wordwall phase suggest greater consistency in students' positive responses across questionnaire items.

Observation Results

Classroom observations, guided by a ten-indicator rubric, across the two phases showed a clear trend of increased learner engagement and participation when the Wordwall game was introduced. In the pre-intervention phase, when non-digital games were used, the average engagement score was 55% ("Fair") on the observation scale (adapted from Rachmawati et al., 2020) (see **Supplementary 2A**).

Although students responded positively to familiar routines and greetings, their overall engagement in cognitively demanding tasks remained moderate. Engagement was largely limited to more energetic and confident students, while less proficient students tended to be passive. Interactive activities such as discussions and questions attracted minimal participation, and post-lesson presentations recorded the lowest engagement.

On the other hand, during the intervention phase (Cycles 1 and 2), when the Wordwall game was incorporated, engagement levels improved, with an average score of 75% ("Good") (see **Supplementary 2B**). Students displayed greater enthusiasm, competitiveness, and cooperation, especially during pre- and in-class activities. They proactively prepared their devices and enthusiastically participated in digital game sessions.

Researcher's Self-reflection Journal

As shown in **Table 3**, engagement scores increased steadily across the intervention phases. In the pre-intervention phase, student engagement was inconsistent, with stronger students participating more actively while weaker students often remained hesitant or passive. Observation checklist results showed that only 30-40% of students regularly responded quickly during non-digital game activities.

Vocabulary recall across lessons was also limited, as many students struggled to remember previously learned words during follow-up tasks. Although activities like Bingo and Slap the board created temporary excitement, classroom interactions remained largely teacher-centered and short-lived.

In Cycle 1, the introduction of Wordwall games (e.g., Open the box, Match up, Anagram) resulted in observable improvements in classroom participation and vocabulary engagement. Observation records indicated that approximately 70-80% of students actively participated in game activities, responded more quickly to vocabulary questions, and demonstrated greater willingness to collaborate with peers. Reflection journals also noted that many students began reviewing vocabulary before class to achieve higher scores during the games.

By Cycle 2, clearer evidence of vocabulary development and learner autonomy emerged. Observation checklist scores presented consistently high levels of behavioral and cognitive engagement across lessons, particularly in activities such as Crossword, Sentence completion, and Word search.

In several sessions, 36-38 out of 40 students got full scores in Wordwall tasks, indicating improved word recognition, spelling accuracy, and contextual vocabulary use. Reflection journals further documented increased student confidence, more peer interaction, and greater independence in vocabulary preparation outside the classroom.

Table 3. Observation Checklist Results Across Phases

Phase	Behavioral Engagement	Cognitive Engagement	Emotional Engagement
Pre-intervention	58%	55%	60%
Cycle 1	76%	74%	79%
Cycle 2	88%	86%	90%

Table 4. Lexical Analysis

Case	Pre-intervention Level	Post-intervention Level	Key Lexical Features Observed
10	A1 – A2	B1	Spelling accuracy is improved; vocabulary choices are more precise in speaking tasks.
20	A2	B1 – B2	There has been an increase in fixed phrases and specialized idioms.
30	B1	B2 – C1 (Occasional)	Extensive vocabulary; exceptional fluency in both spoken and written communication.

Integration of Lexical Analysis

To support these counterintuitive findings, the oral and written performances of three representative students (cases 10, 20, and 30) were analyzed by Text Inspector (Cambridge University Press). The three students were purposively selected to represent low-, medium-, and high-performing learners based on classroom performance. The lexical analysis confirmed measurable improvements in vocabulary sophistication and variety in all three students (see **Table 4**). These linguistic results aligned closely with classroom observations and journal reflections, reinforcing the conclusion that Wordwall-based activities facilitated both behavioral engagement and lexical advancement.

DISCUSSION

Students' Perceptions of Wordwall Games

Overall, learners reported a more positive perception of Wordwall games compared to non-digital ones. The questionnaire data indicated a shift in learning patterns. The increase in mean score, from a neutral baseline ($M = 2.89$) to a high level after intervention ($M = 4.35$), suggested that Wordwall is not merely a novelty but a preferred instructional method. These findings were consistently supported by classroom observations and teacher reflection journals, which showed higher levels of sustained motivation, enjoyment, and attention in Wordwall-based lessons. Notably, most students participate actively (observation scores increased from 55% in the pre-intervention phase to 89% by Cycle 2), and participation was more evenly distributed across proficiency levels, including those who had previously been passive learners.

These patterns can be explained through the model of learner engagement in digital game-based vocabulary learning by Zhang et al. (2023), which conceptualizes engagement as a multidimensional construct encompassing behavioral, cognitive, and emotional components. In this study, Wordwall's design features (such as instant feedback, timed challenges, and peer interaction) appear to promote active engagement, deeper vocabulary processing, and positive learning emotions. Teacher reflections also reveal the emergence of autonomy in learners during the intervention, as some students began preparing vocabulary prior to the lesson in preparation for game engagement. This shift toward more self-regulating behavior can be interpreted as a form of cognitive and emotional engagement, consistent with the model of Zhang et al. (2023), which emphasizes learner initiative as the primary outcome of effective digital game-based vocabulary learning.

Effects of Wordwall Games on Vocabulary Acquisition

Classroom observations and reflection journals showed improved vocabulary retention, higher accuracy, and more frequent use of newly learned words in speaking and writing exercises. Compared to non-digital games, activities with Wordwall appeared to support repeated exposure to vocabulary in various formats, reinforcing both form and meaning.

The observed behavioral changes (such as better preparation, faster recall, and more confident language use) can be explained through Engagement Theory, which posits that learning is reinforced when students make cognitive and social investments in tasks. Wordwall's competitive yet cooperative structure encourages learners to focus, respond quickly, and monitor their own performance, thereby maintaining attention and reinforcing vocabulary learning. Vocabulary analysis by Text Inspector provided further evidence supporting these interpretations. Improvements in vocabulary range and complexity among representative students demonstrate enhanced engagement coupled with observable language development. When compared with observational and reflective data, these findings suggested that Wordwall-based activities not only increase classroom engagement but also facilitate deeper vocabulary processing.

Relationship to Previous Studies

The study's findings are consistent with previous studies conducted in Vietnam (Minh & Nguyen, 2024; Thu & The, 2024), which reported on the positive effects of Wordwall on vocabulary learning and learner motivation. However, this study expands on previous work by utilizing multiple data sources to capture both linguistic outcomes and behavioral and emotional aspects of engagement. The combination of data from questionnaires, observations, journals, and vocabulary analysis provides deeper insights into how digital game-based learning works within a real-world classroom context.

CONCLUSION AND IMPLICATIONS

Conclusion

This classroom-based action study addressed a common practical pedagogical problem in teaching EFL vocabulary at the high school level: the limited engagement and difficulty of students in learning and using new vocabulary when using non-digital games. The study examined whether integrating Wordwall, a digital game-based learning platform, could enhance learner engagement and support EFL vocabulary development for 11th-grade students. Based on data from questionnaires, classroom observations, and teacher reflection journals, the results showed that students responded more positively to Wordwall-based activities compared to non-digital games. Learners consistently reported higher levels of motivation, enjoyment, and sustained attention, and classroom observations showed more balanced engagement across proficiency levels. Furthermore, qualitative evidence from journal entries and task performance showed improvements in vocabulary recall, accuracy, and contextual use in speaking and writing activities. Instead of attributing these results solely to the digital format, the findings suggest that the instructional design of the Wordwall games played a crucial role. Features such as instant feedback, repeated exposure to the target vocabulary, timed challenges, and clear peer involvement appeared to encourage sustained active engagement and focus throughout the lessons. Therefore, vocabulary learning shifted from a primarily teacher-directed activity to a more interactive and learner-centered process.

Pedagogical Implications

Drawing on Engagement Theory, this study highlights the importance of designing vocabulary learning tasks that promote interaction, collaboration, and genuine participation. Teachers should intentionally integrate digital platforms such as Wordwall to facilitate meaningful learner engagement. Teachers are also encouraged to design learner-centered challenges in which students work in pairs or small groups to create, edit, or compete in Wordwall tasks. This process not only reinforces target vocabulary but also fosters autonomy, self-control, and social interaction - core components of Engagement Theory. In addition, gamified environments help reduce performance anxiety, allowing even less confident learners to actively participate. EFL educators should view digital games as pedagogical tools that combine fun and learning. When implemented

thoughtfully, Wordwall and similar applications can transform vocabulary teaching from passive memorization to an interactive, dynamic process that fosters motivation, engagement, and long-term language retention.

LIMITATIONS AND RECOMMENDATIONS

Although this study contributed meaningful insights into the pedagogical value of Wordwall games, some limitations must be acknowledged. The small sample size - restricted to a single 11th-grade class - limits generalizability. Future research should include larger and more diverse populations across different regions and skill levels to validate these findings. Moreover, the study did not differentiate between different types of Wordwall games. Each format (e.g., matching, anagram, quiz) may impact vocabulary learning in different ways, suggesting that comparative studies are needed to determine which designs best support specific learning outcomes.

In addition, the current study assumes access to digital devices and a stable internet connection. Further research should consider contexts where technological constraints may impact implementation. Finally, future research could also explore integrated digital ecosystems, combining Wordwall with other tools such as Quizlet or Kahoot to determine synergistic effects on engagement and retention. Longitudinal studies could reveal how continued use of digital games impacts long-term vocabulary growth and learner autonomy.

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AI statement: AI-generated tools were used solely to enhance the language quality and readability of the manuscript. The core research design, data collection, analysis, and initial ideas were developed independently by the authors.

Data sharing statement: Due to the sensitive nature of classroom data, the dataset is not publicly available. Anonymized excerpts may be shared upon reasonable request for academic purposes.

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