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ENHANCING EFL/ESL VOCABULARY LEARNING THROUGH WORDWALL-BASED GAMIFICATION: A SYSTEMATIC REVIEW OF COGNITIVE AND AFFECTIVE OUTCOMES IN EDUCATIONAL TECHNOLOGY RESEARCH

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ABSTRACT

The growing incorporation of gamification and interactive digital platforms has become a pivotal development in English vocabulary instruction across EFL/ESL settings. Among these emerging tools, Wordwall has attracted considerable scholarly attention due to its capacity to foster engaging, technology-mediated learning experiences. This study seeks to critically synthesize recent empirical and review-based literature on the effectiveness of Wordwall and gamified instructional strategies in vocabulary acquisition. Employing a systematic literature review methodology, the analysis draws on studies presented in the provided literature tables, with particular emphasis on cognitive learning outcomes, affective dimensions, and prevailing methodological approaches. The findings consistently demonstrate that Wordwall-supported gamification enhances vocabulary mastery, improves retention and recall, and contributes to higher levels of academic achievement across diverse educational contexts. Moreover, affective factors such as learner motivation, enjoyment, active engagement, classroom participation, and positive attitudes toward learning emerge as key determinants of instructional success. The review also underscores the increasing relevance of educational technology and game-based learning in advancing interactive, student-centered vocabulary instruction. Overall, the evidence suggests that Wordwall holds substantial pedagogical value for contemporary EFL/ESL vocabulary learning environments.

Keywords: Wordwall, Gamification, Vocabulary Learning, EFL/ESL Education, Educational Technology

1. INTRODUCTION

Vocabulary acquisition is widely recognized as a foundational component of English language learning, as it directly shapes learners' capacity to comprehend, communicate, read, and write effectively in EFL/ESL contexts. Insufficient vocabulary knowledge often limits communicative competence and undermines learners' confidence in classroom interaction (Al-Obaydi, Nashruddin, Rahman, & Suherman, 2021; Purnamaningwulan & Purwanto, 2025). Consequently, vocabulary instruction has become a central concern in English language pedagogy, particularly in environments where English functions as a foreign or second language. Recent advancements in educational technology have further encouraged the integration of digital and interactive instructional approaches to address persistent

limitations associated with traditional vocabulary teaching practices (Yahya et al., 2019; Olszewski & Crompton, 2020; Sweller, 2020).

In many EFL/ESL classrooms, conventional vocabulary instruction is still dominated by translation-based memorization, teacher-centered explanations, and repetitive drills that provide minimal opportunities for meaningful interaction (Sari, 2020; Belinda, 2025; Seroja Br Ginting & Fithriani, 2021). Such instructional practices tend to diminish learner motivation and engagement, ultimately resulting in weak vocabulary retention and passive learning behaviors. Several reviewed studies indicate that traditional approaches are less effective in facilitating meaningful vocabulary acquisition when compared to interactive, technology-enhanced instructional models (Handikaningtyas et al., 2025; Pratiwi et al., 2025). Moreover, persistent constraints such as limited teacher digital literacy, inadequate infrastructure, insufficient pedagogical training, and time restrictions further hinder the effectiveness of vocabulary instruction across various educational settings (Handikaningtyas et al., 2025; Pratiwi et al., 2025). These conditions highlight the urgent need for more innovative, engaging, and learner-centered instructional strategies capable of fostering sustained vocabulary development.

In response to these pedagogical challenges, gamification and game-based learning have increasingly emerged as effective alternatives in language education. Gamification involves the integration of game-like elements such as competition, rewards, instant feedback, and interactive tasks into instructional processes to enhance learner engagement and motivation. Existing literature consistently demonstrates that gamification positively influences language learning outcomes, including motivation, participation, attitudes, and academic performance (Arip & Hashim, 2024). Similarly, game-based learning supported by multimodal instructional media has been shown to enhance vocabulary acquisition, retention, and depth of cognitive processing more effectively than conventional teaching methods (Handikaningtyas et al., 2025; Nadolny et al., 2020; de Carvalho & Coelho, 2022). The use of digital games in educational contexts also fosters learner-centered learning by encouraging exploration, repetition, and immediate reinforcement, all of which are essential for vocabulary development (Adhe et al., 2025; Pelangi et al., 2025; Lesiana et al., 2023).

Among various gamified learning platforms, Wordwall has gained considerable attention in recent EFL/ESL vocabulary research (Yu, 2023; Shortt et al., 2023; Pelangi et al., 2025). Wordwall is an interactive digital tool that enables educators to design game-based vocabulary activities, including quizzes, matching tasks, word games, and collaborative exercises. The platform integrates visual interaction, repetition, competition, and immediate feedback to create engaging and dynamic learning experiences. Empirical studies consistently report that Wordwall significantly enhances vocabulary mastery, retention, and academic achievement across different educational levels. Experimental findings further demonstrate marked improvements in learners' post-intervention performance following the implementation of Wordwall-based instructional activities (Nurammida et al., 2024; Sakkir et al., 2023; Alfares, 2025). In addition, its effectiveness has been documented not only in general EFL classrooms but also in specialized contexts such as vocational English and hospitality education, where vocabulary acquisition is closely linked to practical communicative needs

(Syarifah & Fediyanto, 2025; Arsini et al., n.d.).

Beyond cognitive gains, prior research also highlights the affective benefits of Wordwall-assisted learning. Students commonly perceive Wordwall-based activities as enjoyable, motivating, interactive, and conducive to active participation in classroom learning (Rubykania et al., 2025; Ulya et al., 2025; Bahauddin & Mustofa, 2025). Gamified learning environments contribute to enhanced emotional, behavioral, and cognitive engagement while simultaneously reducing boredom often associated with traditional vocabulary instruction. Furthermore, Wordwall has been shown to promote collaboration, communication, learner confidence, and autonomy (Purnamasari & Purwandari, 2025). These findings suggest that Wordwall's effectiveness extends beyond lexical acquisition, encompassing broader motivational and engagement-related dimensions that are essential for successful language learning.

Recent scholarly trends indicate a growing interest in gamification, educational technology, and Wordwall-based vocabulary instruction. Systematic literature reviews by Handikaningtyas et al. (2025), Pratiwi et al. (2025), and Purnamasari and Purwandari (2025) reveal an increasing number of studies addressing game-based learning, multimodal instruction, and interactive vocabulary pedagogy. In parallel, most empirical investigations employ quantitative, quasi-experimental, descriptive, or pre-experimental designs to assess the effectiveness of Wordwall across diverse learning contexts. Overall, these studies consistently report positive cognitive and affective outcomes, thereby reinforcing the pedagogical relevance of gamified instructional approaches in contemporary EFL/ESL education. However, the existing literature remains fragmented across different educational levels, methodological designs, and learning environments.

Despite this expanding body of research, several critical gaps remain insufficiently explored. First, many studies emphasize learners' motivational perceptions without providing an integrated synthesis of both cognitive and affective outcomes. Second, a considerable number of empirical works are constrained by small sample sizes, lack of control groups, short intervention durations, and limited contextual variation (Rubykania et al., 2025; Sakkir et al., 2023; Bahauddin & Mustofa, 2025). Third, existing review studies often address gamification in general terms without specifically focusing on Wordwall as a distinct technological platform within EFL/ESL vocabulary learning. Additionally, there is still limited comprehensive analysis of how Wordwall simultaneously supports vocabulary mastery, learner engagement, interaction, and student-centered pedagogy across varied educational settings. These limitations indicate the necessity for a more focused and integrative synthesis of Wordwall-based gamification in vocabulary learning.

Therefore, this study aims to systematically synthesize recent empirical evidence on the role of Wordwall and gamification in EFL/ESL vocabulary acquisition. Specifically, it examines cognitive learning outcomes, affective dimensions, and emerging research trends associated with Wordwall-supported instructional environments. By integrating findings from recent empirical and review-based studies, this work seeks to provide a coherent and critical overview of how Wordwall contributes to vocabulary development, learner engagement, and the enhancement of interactive learning experiences in contemporary educational technology contexts.

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2. METHODS

Research Design

This study employed a Systematic Literature Review (SLR) approach to synthesize empirical evidence regarding the use of Wordwall and gamification in EFL/ESL vocabulary learning. The review adopted a qualitative-descriptive synthesis design to identify research trends, cognitive outcomes, affective outcomes, and methodological characteristics across the selected studies. The SLR approach was selected because it enables structured identification, screening, evaluation, and synthesis of relevant studies within a particular research domain. In addition, the review followed the general principles of the PRISMA framework to ensure transparent and systematic article selection procedures, as reflected in several reviewed studies (Handikaningtyas et al., 2025; Purnamasari & Purwandari, 2025).

The review specifically focused on studies discussing Wordwall, gamification, game-based learning, vocabulary mastery, vocabulary retention, learner engagement, and educational technology in EFL/ESL contexts. Both empirical and review-based studies were included to obtain comprehensive perspectives concerning the pedagogical implementation of Wordwall-based learning environments.

Data Sources

The data used in this study were derived exclusively from the uploaded literature review tables containing empirical and review-based studies related to Wordwall, gamification, and vocabulary learning. The reviewed articles originated from various educational contexts, including elementary schools, junior high schools, senior high schools, vocational education, hospitality education, and advanced EFL learning environments. The studies also represented multiple countries, predominantly Indonesia, with additional contributions from Malaysia and Saudi Arabia.

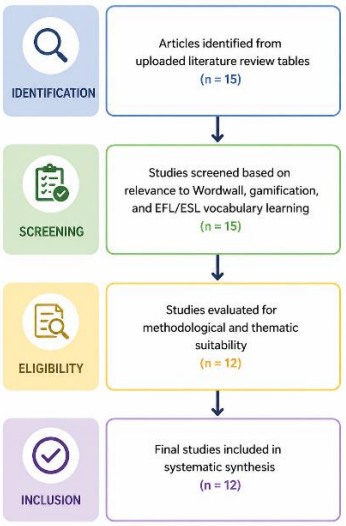

Figure 1. PRISMA Flow Diagram

The uploaded tables contained detailed information regarding authors, publication year, country, educational level, research methodology, sample characteristics, learning focus, cognitive outcomes, affective outcomes, key findings, and study limitations. These structured datasets enabled systematic comparison and thematic synthesis across the reviewed studies. The final review included systematic reviews, quasi-experimental studies, pre-experimental studies, qualitative case studies, descriptive quantitative studies, survey studies, and research-and-development investigations.

Figure 1 illustrates the systematic review procedure adapted from the PRISMA framework. The process began with article identification from the uploaded literature review tables, followed by relevance screening and eligibility assessment. Studies that specifically addressed Wordwall, gamification, vocabulary learning outcomes, learner engagement, and educational technology in EFL/ESL contexts were retained for final synthesis.

Inclusion and Exclusion Criteria

To maintain consistency and relevance, this review applied specific inclusion and exclusion criteria during the article selection process.

Table 1. Inclusion and Exclusion Criteria

Criteria Aspect	Inclusion Criteria	Exclusion Criteria
Research	Wordwall,	Studies

Topic	gamification, vocabulary learning, EFL/ESL learning	unrelated to vocabulary or gamification
Educational Context	EFL/ESL educational settings	Non-language learning contexts
Publication Type	Empirical studies and systematic reviews	Opinion articles and unrelated conceptual papers
Outcomes	Cognitive or affective learning outcomes	Studies without learning outcome discussion
Language Focus	English vocabulary learning	Non-English learning focus
Data Availability	Studies with identifiable findings and limitations	Incomplete or unclear research data

Table 1 demonstrates that the review prioritized studies discussing cognitive outcomes such as vocabulary mastery, vocabulary acquisition, vocabulary retention, and academic achievement, as well as affective outcomes including motivation, engagement, enjoyment, and participation. Studies lacking sufficient methodological or thematic relevance were excluded from the synthesis process.

Data Extraction

Data extraction was conducted systematically by categorizing information from the uploaded literature review tables into several analytical dimensions. The extracted data included author information, publication year, country, educational level, research methodology, learning focus, key findings, and study limitations. Additional emphasis was placed on identifying recurring cognitive and affective outcomes associated with Wordwall-based vocabulary learning.

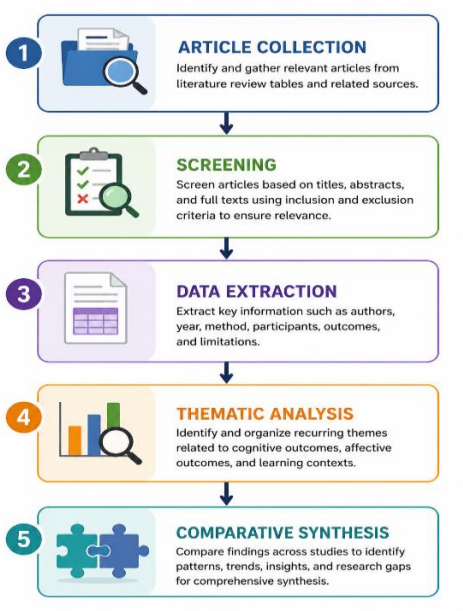

Figure 2. Research Methodology Framework

The extraction process also enabled cross-study comparison regarding methodological tendencies and implementation patterns. Most reviewed studies emphasized vocabulary mastery improvement, vocabulary retention, learner engagement, and motivational enhancement through gamified learning activities. However, several studies also reported methodological limitations such as small sample sizes, lack of control groups, short intervention duration, and perception-based analysis (Rubykania et al., 2025; Ulya et al., 2025; Bahauddin & Mustofa, 2025).

Figure 2 presents the overall research methodology framework employed in this review. The framework demonstrates the sequential process beginning from article collection and screening, followed by data extraction and thematic analysis. The final stage involved comparative synthesis to identify dominant trends, shared findings, and research gaps across the reviewed studies.

Data Analysis Technique

This study employed thematic analysis and comparative synthesis techniques to interpret the extracted data. Thematic analysis was used to identify recurring themes related to cognitive outcomes, affective outcomes, educational technology integration, and gamification practices. The analysis particularly focused on vocabulary

acquisition, vocabulary retention, learner engagement, motivation, participation, and interactive learning quality.

Comparative synthesis was subsequently applied to compare findings across different educational levels, countries, and methodological approaches. This analytical strategy enabled identification of dominant research patterns and emerging trends concerning Wordwall implementation in EFL/ESL vocabulary learning. Furthermore, methodological strengths and limitations across the reviewed studies were critically compared to reveal areas requiring further investigation.

Table 2 summarizes the methodological characteristics and major findings of the reviewed studies. The table demonstrates that Wordwall and gamification consistently contributed to vocabulary improvement, learner engagement, and interactive learning experiences across multiple educational contexts. Nevertheless, recurring limitations such as small samples, context-specific implementation, and lack of experimental control indicate the need for more rigorous future investigations.

Table 2. Summary of Reviewed Articles

Author(s)	Year	Method	Educational Level	Key Findings
Handikaningtyas et al.	2025	SLR	EFL/Secondary	GBL improved vocabulary acquisition, retention, and engagement
Pratiwi et al.	2025	SLR	Elementary	Wordwall and game techniques improved vocabulary mastery
Rubykania et al.	2025	Qualitative case study	Junior high school	Wordwall improved recall, participation, and motivation
Ulya et al.	2025	Quantitative descriptive	Junior high school	Wordwall increased engagement and perceived vocabulary recall
Purnamasari & Purwandari	2025	SLR	Multiple levels	Wordwall enhanced interactive learning quality and motivation
Nurammida et al.	2024	Pre-experimental	Junior high school	Significant improvement in vocabulary achievement
Syarifah & Fediyanto	2025	Quasi-experimental	Vocational school	Wordwall improved ESP vocabulary retention
Sakkir et al.	2023	Pre-experimental	Senior high school	Wordwall enhanced EFL vocabulary mastery
Alfares	2025	Quasi-experimental	Secondary school	Wordwall improved vocabulary learning achievement
Bahauddin & Mustofa	2025	Survey	Advanced EFL learners	Students perceived Wordwall as motivating and enjoyable
Arip & Hashim	2024	SLR	ESL/EFL learners	Gamification positively affected engagement and language learning
Fathoni et al.	2025	R&D	Junior high school	Gamified inquiry learning improved learning outcomes and motivation

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3. RESULTS AND DISCUSSION

Figure 3 presents the PRISMA-based article selection process used in this systematic literature review. The identification stage involved collecting studies from the uploaded literature review tables related to Wordwall, gamification, educational technology, and vocabulary learning in EFL/ESL contexts. During the screening stage, studies were evaluated based on thematic relevance to vocabulary instruction and gamified learning approaches. The eligibility stage further assessed methodological suitability, research focus, and clarity of findings. Finally, twelve studies were retained for systematic synthesis because they provided relevant evidence regarding cognitive and affective outcomes associated with Wordwall-based learning.

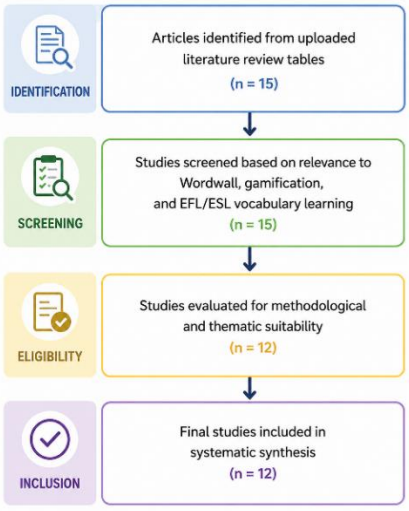

Figure 3. PRISMA Flow Diagram

Figure 4. Research Methodology Framework

Figure 4 illustrates the overall research methodology framework employed in this study. The process began with article collection from the uploaded review tables, followed by screening procedures to ensure thematic relevance and methodological appropriateness. Data extraction was subsequently conducted to identify essential information, including research methods, educational contexts, findings, and limitations. The extracted information was then analyzed using thematic analysis to identify recurring patterns related to vocabulary mastery, learner engagement, motivation, and gamification practices. Finally, comparative synthesis was applied to compare findings across studies and identify dominant research trends and gaps in Wordwall-based EFL/ESL vocabulary learning research.

Table 3 summarizes the criteria used to determine article eligibility in the review process. The inclusion criteria prioritized studies focusing on Wordwall, gamification, and vocabulary learning within EFL/ESL educational settings. In contrast, studies lacking methodological clarity or direct relevance to vocabulary instruction and educational technology were excluded. These criteria ensured that the final dataset remained analytically focused and methodologically consistent for comparative synthesis.

Table 4 provides a concise comparison of the reviewed studies based on methodological characteristics, educational contexts, findings, and research limitations. Most studies consistently reported positive impacts of Wordwall and gamification on vocabulary mastery, learner motivation, engagement, and interactive learning quality. However, several recurring limitations were identified, including small sample sizes, lack of experimental controls, context-specific implementation, and reliance on perception-based analysis. These patterns indicate that although Wordwall demonstrates strong pedagogical potential, further large-scale and

experimentally rigorous studies are still necessary.

Wordwall Across Educational Levels

The reviewed studies demonstrate that Wordwall has been implemented across diverse educational levels, ranging from elementary education to advanced EFL/ESL contexts. At the elementary level, gamified vocabulary instruction consistently contributed to improved vocabulary mastery, learner participation, and classroom engagement. Pratiwi et al. (2025) reported that Wordwall and other game-based techniques significantly enhanced vocabulary acquisition, with many studies showing measurable score improvement and increased learner motivation. These findings suggest that younger learners benefit from interactive repetition, visual stimulation, and competitive learning activities embedded within Wordwall-based environments.

Table 3. Inclusion and Exclusion Criteria

Criteria Aspect	Inclusion Criteria	Exclusion Criteria
Topic	Wordwall, gamification, vocabulary learning, EFL/ESL education	Studies unrelated to vocabulary learning or gamification
Educational Context	English language learning environments	Non-language learning contexts
Research Type	Empirical studies and systematic reviews	Opinion papers and unrelated conceptual articles
Outcomes	Cognitive and affective learning outcomes	Studies without learning outcome discussion
Data Availability	Studies with clear findings and limitations	Incomplete or unclear studies
Publication Focus	Educational technology and interactive learning	Non-educational technology focus

Table 4. Summary of Reviewed Articles

Author(s)	Year	Method	Level	Main Findings
Handikaningtyas et al.	2025	SLR	EFL/Secondary	GBL improved vocabulary and engagement
Pratiwi et al.	2025	SLR	Elementary	Wordwall improved vocabulary mastery
Rubykania et al.	2025	Qualitative	Junior high	Increased recall and motivation
Ulya et al.	2025	Quantitative	Junior high	Improved engagement and recall
Purnamasari & Purwandari	2025	SLR	Multiple levels	Enhanced interactive learning quality
Nurammida et al.	2024	Pre-experimental	Junior high	Significant score improvement
Syarifah & Fediyanto	2025	Quasi-experimental	Vocational	Improved ESP vocabulary retention
Sakkir et al.	2023	Pre-experimental	Senior high	Enhanced vocabulary mastery
Alfares	2025	Quasi-experimental	Secondary	Improved vocabulary achievement
Bahauddin & Mustofa	2025	Survey	Advanced EFL	Positive engagement and motivation
Arip & Hashim	2024	SLR	ESL/EFL	Gamification improved engagement
Fathoni et al.	2025	R&D	Junior high	Improved outcomes and motivation

At the junior high school level, Wordwall was frequently associated with vocabulary retention, learner participation, and enjoyable learning experiences. Rubykania et al. (2025) found that students perceived Wordwall as more engaging and motivating than conventional instruction, while Ulya et al. (2025) emphasized the role of repetition and instant feedback in supporting vocabulary recall. Similarly, Nurammida et al. (2024) and Fathoni et al. (2025) reported significant improvements in vocabulary achievement and learning motivation through gamified inquiry-based learning models. These findings indicate that Wordwall supports both cognitive reinforcement and affective engagement during early adolescent learning stages.

Table 5. Comparative Summary of Wordwall Effectiveness Across Educational Levels

Educational Level	Dominant Outcomes	Representative Studies
Elementary School	Vocabulary mastery, engagement	Pratiwi et al. (2025)
Junior High School	Recall, retention, motivation	Rubykania et al. (2025); Ulya et al. (2025)
Senior/Secondary School	Vocabulary achievement, participation	Sakkir et al. (2023); Alfares (2025)
Vocational Education	ESP vocabulary retention	Syarifah & Fediyanto (2025)
Hospitality/Professional Context	Work-related vocabulary engagement	Arsini et al. (n.d.)
Advanced EFL/ESL	Motivation and interactive learning	

In secondary and senior high school contexts, Wordwall was primarily implemented to strengthen vocabulary mastery and active classroom interaction. Sakkir et al. (2023) reported substantial score improvement following Wordwall implementation, while Alfares (2025) demonstrated higher post-test achievement among secondary EFL learners exposed to Wordwall-based instruction. The reviewed studies indicate that competitive and interactive digital environments become increasingly relevant for older learners who require greater autonomy and contextualized language learning experiences.

Vocational and professional-oriented educational settings also demonstrated positive outcomes. Syarifah and Fediyanto (2025) found that Wordwall effectively improved ESP vocabulary retention among vocational students, while Zheng (2024) reported increased work-related vocabulary engagement in hospitality education contexts. These findings imply that Wordwall is adaptable not only for general vocabulary learning but also for context-specific language instruction requiring practical communicative competence.

At broader EFL/ESL levels, systematic reviews consistently highlighted the effectiveness of gamification and multimodal learning in promoting vocabulary acquisition and learner engagement (Handikaningtyas et al., 2025; Arip & Hashim, 2024). Collectively, the evidence demonstrates that Wordwall-based gamification is pedagogically flexible across educational levels and learning environments. However, implementation effectiveness often depends on instructional design quality, technological readiness, and learner characteristics (Sujarwo et al., 2023; Jaya et al., 2025; Mahesti et al., 2025).

Table 5 demonstrates that Wordwall consistently supports both cognitive and affective learning outcomes across educational levels. While vocabulary mastery and retention remain dominant cognitive outcomes, engagement and motivation repeatedly emerged as important affective dimensions contributing to learning effectiveness.

Comparative Analysis of Research Findings

A comparative review of the selected studies reveals strong consistency regarding the positive influence of Wordwall and gamification on vocabulary learning. Most empirical studies reported measurable improvement in vocabulary acquisition, vocabulary retention, learner participation, and engagement. Quantitative and quasi-experimental studies generally demonstrated statistically significant achievement improvement, while qualitative and perception-based studies emphasized motivation, enjoyment, and classroom interaction (Creswell & Plano Clark, 2023).

Despite methodological variation, several recurring instructional features were identified across the studies. First, repetition and instant feedback emerged as central mechanisms supporting vocabulary recall and retention.

Table 6. Strengths, Limitations, and Future Research Directions

Aspect	Major Findings
Strengths	Improved vocabulary mastery, engagement, motivation, and interactive learning
Methodological Limitations	Small samples, lack of control groups, perception-based analysis
Contextual Limitations	Predominantly Indonesian educational settings
Technical Challenges	Limited facilities, internet access, digital readiness
Future Directions	Larger experimental studies, longitudinal research, cross-cultural analysis

Ulya et al. (2025) specifically highlighted the importance of repetitive interactive tasks, while Rubykania et al. (2025) reported improved vocabulary recall among students exposed to Wordwall activities. Second, competitive and game-oriented environments consistently increased learner motivation and active participation. These elements align with broader gamification principles discussed by Arip and Hashim (2024), who argued that gamified learning environments positively influence learner attitudes and engagement in ESL/EFL education.

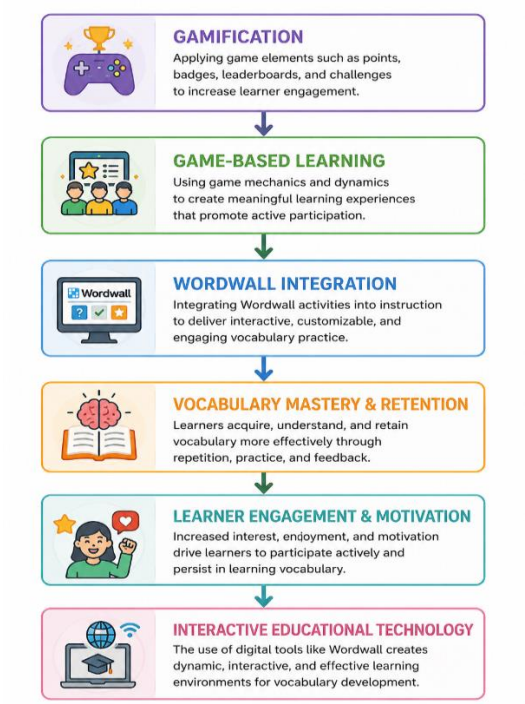

Figure 5. Research Trend Mapping

Nevertheless, the reviewed findings also reveal methodological imbalances. Experimental studies frequently emphasized measurable achievement outcomes, whereas survey and descriptive studies focused more heavily on perception-based responses. Consequently, many studies lacked comprehensive integration between cognitive and affective dimensions. Furthermore, the majority of reviewed studies were conducted in Indonesian educational settings, indicating limited geographical diversity and restricted cross-cultural generalizability.

Figure 5 illustrates the dominant research trend identified in the reviewed studies. Earlier studies primarily focused on general gamification and game-based learning approaches before gradually emphasizing Wordwall-specific implementation in vocabulary instruction. Recent studies increasingly integrate educational technology, learner engagement, and interactive learning quality into vocabulary learning research.

Challenges and Limitations in Wordwall Implementation

Although the findings generally support the effectiveness of Wordwall-based learning, multiple challenges and limitations were repeatedly identified. One major limitation concerns teacher readiness and digital pedagogical competence. Handikaningtyas et al. (2025) emphasized that insufficient technological skills among educators may reduce the effectiveness of gamified learning implementation. Similarly, Pratiwi et al. (2025) reported that limited facilities and restricted instructional time remain important barriers in many educational settings.

Methodological weaknesses also appeared consistently throughout the reviewed studies. Several investigations employed small sample sizes, lacked control groups, or relied primarily on descriptive and perception-based analysis. For example, Sakkir et al. (2023) and Nurammida et al. (2024) conducted pre-experimental studies without control groups, limiting the strength of causal interpretation. Ulya et al. (2025) and Bahauddin and Mustofa (2025) focused mainly on learner perceptions rather than objective achievement measurement. These methodological limitations reduce the generalizability and experimental rigor of existing evidence.

Another important issue concerns contextual dependency. Many studies were conducted within single institutions or localized educational environments, making it difficult to generalize findings across broader EFL/ESL contexts. Technical issues such as internet instability, limited digital infrastructure, and resistance to technology adoption were also identified as practical implementation barriers (Fathoni et al., 2025; Rubykania et al., 2025).

Table 6 summarizes the dominant strengths and limitations identified in the reviewed literature while highlighting directions for future research development.

Research Trends and Future Directions

The reviewed studies indicate a growing academic interest in gamified vocabulary learning and educational technology integration in EFL/ESL contexts. Recent research increasingly emphasizes learner-centered and technology-supported instructional models capable of improving both cognitive and affective learning outcomes. Systematic literature reviews have become more prominent, reflecting broader scholarly attempts to synthesize findings across educational technology research domains (Handikaningtyas et al., 2025; Purnamasari & Purwandari, 2025).

Future research should prioritize stronger experimental designs involving larger and more diverse participant populations. Longitudinal studies are particularly necessary to examine long-term vocabulary retention and sustained learner engagement beyond short-term intervention periods. Cross-cultural comparative research would also strengthen understanding regarding the adaptability of Wordwall across diverse educational systems and learner populations.

In addition, future investigations should integrate mixed-method approaches combining quantitative achievement analysis with qualitative learner experience exploration. Such integration would enable more comprehensive understanding regarding the interaction between vocabulary acquisition, motivation, engagement, and digital learning behavior. There is also significant opportunity for future studies to explore the integration of Wordwall with emerging educational technologies such as adaptive learning systems, AI-supported feedback mechanisms, and multimodal learning environments.

Figure 6 presents the synthesized conceptual model derived from the reviewed studies. The model demonstrates that Wordwall features such as gamification, feedback, repetition, and competition contribute to increased learner motivation and engagement, which subsequently promote active participation and vocabulary retention. Ultimately, these interconnected processes support improved vocabulary mastery within EFL/ESL learning environments.

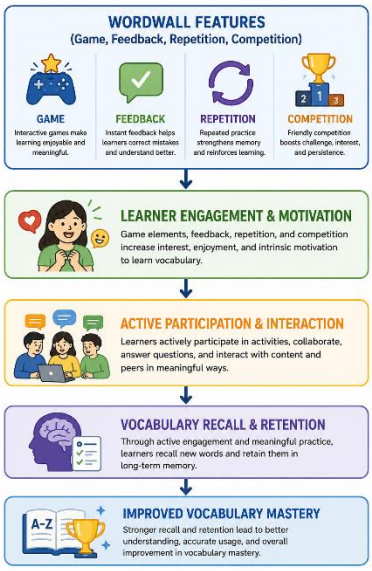

Figure 6. Synthesis Model of Gamified Vocabulary Learning

4. CONCLUSION

This systematic literature review demonstrates that Wordwall and gamification-based learning positively influence vocabulary learning in EFL/ESL contexts across multiple educational levels. The reviewed studies consistently reported improvements in vocabulary mastery, vocabulary retention, learner engagement, motivation, and classroom participation. Interactive features such as repetition, instant feedback, and competition contributed to more meaningful and learner-centered vocabulary instruction compared with conventional approaches.

Pedagogically, the findings suggest that Wordwall can serve as an effective educational technology tool for supporting interactive and motivating vocabulary learning environments. Theoretically, the review reinforces the role of gamification and game-based learning in connecting cognitive learning outcomes with affective dimensions such as motivation and engagement.

However, several limitations remain evident in the existing literature, including small sample sizes, perception-based analysis, lack of control groups, and limited geographical diversity. Most studies were also conducted within Indonesian educational settings, limiting broader generalization.

Future research should therefore employ larger experimental designs, longitudinal studies, and cross-cultural investigations to strengthen empirical evidence regarding Wordwall effectiveness in vocabulary learning. In addition, future studies should integrate cognitive and affective evaluation to provide more comprehensive understanding of gamified vocabulary learning in EFL/ESL education.

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