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Enhancing EFL Writing Proficiency among Undergraduates through Gamified Vocabulary Instruction: A Mixed-Methods Investigation of Word Wall Integration

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ABSTRACT

This study investigates the impact of *Word Wall* activities on enhancing the writing skills of undergraduate English as a Foreign Language (EFL) students at Northern Border University. Acknowledging the challenges EFL learners encounter in developing academic and expressive writing, the research explores how visually engaging and interactive vocabulary strategies can facilitate written language acquisition. Utilizing a mixed-methods research design, data were systematically collected from a sample of 120 female students enrolled in Levels 7 and 8. The data collection process included numerical tests to gather measurable data that could be analyzed statistically, along with personal reflections to gain a deeper understanding of individual experiences. The results show a meaningful improvement in students' writing skills, especially in using a variety of words, correct grammar, and clear organization, with average scores of 4.79 and 4.93, and a strong statistical measure of 0.366 ($p < 0.001$). Participants reported increased motivation, enhanced vocabulary retention, and greater confidence in writing tasks. These findings underscore the pedagogical value of *Word Wall* activities as an effective approach to developing writing proficiency in EFL contexts. The study recommends integrating vocabulary-focused strategies into writing instruction to support learners in academic and professional communication. Future research may

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explore the digital implementation of *Word Walls* to enhance accessibility and engagement.

Keywords: Autonomous Learning; Digital Game-Based Learning (DGBL); Word Wall; Learner Engagement; Vocabulary Acquisition; Writing Proficiency

1. Introduction

The rapid integration of online learning platforms has become a critical component of contemporary education, especially in the context of global disruptions to traditional classroom instruction. The COVID-19 pandemic accelerated this shift, necessitating the adoption of digital tools that could support continuity in teaching and learning while minimizing physical contact^[1]. In this environment, educators faced the dual challenge of ensuring pedagogical effectiveness and maintaining student engagement in the absence of face-to-face interaction^[2].

In response to these challenges, digital game-based platforms have shown promise in increasing motivation and participation among language learners^[3,4]. These tools embed teaching content into interactive activities, encouraging active learning, offering immediate feedback, and helping students develop language skills in an engaging and effective way.

One such tool is *Word Wall*, a platform that enables the creation of customizable, interactive *Word Wall* activities. Physical *Word Walls* are commonly used in classrooms to reinforce vocabulary visually. This study, however, focuses on digital versions like *Word Wall*, which transform traditional *Word Walls* into interactive, game-like activities. These digital tools aim to deepen vocabulary engagement and improve retention through dynamic exercises. These activities are particularly valuable for English as a Foreign Language (EFL) learners, as vocabulary mastery is foundational to effective writing and overall language proficiency^[5].

Despite the increasing use of platforms like *Word Wall* in EFL contexts, there remains a lack of empirical studies specifically examining their effects on writing development. While prior research has established the positive influence of visual and interactive vocabulary strategies on language learning outcomes, the link between these digital tools and improvements in writing performance has not been extensively explored. Therefore, this study seeks to fill this gap by investigating the impact of *Word Wall*-based vocabulary activities on the writing proficiency of undergraduate EFL

students. In addition, it examines learners' perceptions of the pedagogical value and usability of *Word Wall* in supporting their academic writing development.

1.1. Problem Statement

Despite the growing adoption of online instruction in English as a Foreign Language (EFL) contexts, sustaining student motivation—particularly in the domain of writing—remains a persistent pedagogical challenge. Writing is widely recognized as a cognitively demanding and recursive skill that requires regular practice, immediate feedback, and learner engagement over extended periods^[6,7]. However, virtual learning environments often compromise these essential conditions, leading to reduced interaction, delayed instructor responses, and decreased student engagement^[8,9]. Consequently, learners may struggle to maintain the sustained effort needed for meaningful writing development.

To address these limitations, digital gamified tools grounded in constructivist principles have gained traction. By embedding game-based elements into instructional design, these tools aim to foster learner autonomy, promote interaction, and enhance motivation^[10,11]. *Word Wall*, for instance, offers various interactive, visually engaging activities that can reinforce language skills and increase participation in online settings. However, while these tools seem promising for teaching, there is not much research looking at how gamified platforms affect the writing skills of undergraduate EFL learners. This gap points to a systematic investigation into how tools like *Word Wall* influence both the development of writing proficiency and learners' motivational and attitudinal responses in virtual learning environments.

This study therefore, seeks to address this gap by systematically evaluating the influence of *Word Wall* activities on writing skill development among female undergraduate EFL students and by exploring their attitudes toward the platform as a pedagogical tool in the virtual learning environment. Understanding these dynamics is essential for informing effective instructional design and integrating inno-

vative technologies in higher education language programs.

1.2. Research Objectives

This study aims to rigorously investigate the pedagogical impact of *Word Wall*, an interactive digital game-based learning platform, on the development of writing proficiency and learner engagement among undergraduates of English as a Foreign Language (EFL). Situated within the context of higher education and the increasing reliance on digital technologies in language instruction, the study is guided by the following objectives:

1. Assess the influence of *Word Wall* activities on crucial aspects of writing proficiency, such as lexical development, syntactic accuracy, and idea organization, which are fundamental elements of successful written communication in EFL environments^[12,13].
2. Ascertain the degree to which *Word Wall* enhances learner engagement, participation, and motivation, especially in virtual or digitally mediated instructional environments where traditional interaction is frequently restricted.
3. Explore the perceptions and attitudes of students towards *Word Wall* as a digital pedagogical tool, emphasizing their experiences of interactivity, enjoyment, and perceived effectiveness in enhancing their writing development.
4. Add empirical evidence to the expanding literature on digital game-based learning in foreign language acquisition, specifically focusing on its use in academic writing within tertiary-level EFL education.

By integrating both quantitative and qualitative methodologies, this study seeks to generate a comprehensive understanding of *Word Wall*'s instructional affordances. It also aims to inform the design of evidence-based, technology-integrated writing pedagogies that promote sustained language development and learner autonomy in contemporary EFL classrooms.

1.3. Research Questions

The following research questions drive the investigation:

1. To what extent does *Word Wall* enhance students' participation and writing performance in the EFL classroom?

2. What are students' perceptions of using *Word Wall* to support their writing development in the EFL context?

1.4. Limitations of the Study

This research offers helpful observations about the use of *Word Wall* for enhancing writing proficiency among undergraduate EFL learners. However, the homogeneous sample of 120 female students from a single institution limits the generalizability of its findings. Future research should involve more diverse participants and employ objective measures, such as standardized assessments and multi-rater evaluations, to reduce bias. Longitudinal designs and the inclusion of comparative digital tools are also recommended to assess sustained learning outcomes and broader applicability.

2. Literature Review

Game-Based Learning (GBL) has emerged as a dynamic and effective approach in language education, fostering engagement, motivation, and skill development through interactive, student-centered activities^[10,14]. Unlike traditional instruction, GBL emphasizes active knowledge construction via meaningful, task-based learning that aligns with constructivist principles. Studies indicate that gamification boosts student engagement and retention, especially in online or hybrid settings^[15,16]. Platforms like *Word Wall* exemplify the concept by providing customizable activities—such as quizzes and matching games—that accommodate diverse learning styles and promote inclusive instruction^[17].

Word Wall's interactive format promotes autonomous learning through repeated, scaffolded practice. This supports the acquisition of key language skills like vocabulary retention, sentence construction, grammar accuracy, and reading comprehension—core competencies for EFL learners^[17,18]. Its low-stakes, game-like environment encourages experimentation and iterative learning, enabling learners to make real-time linguistic decisions and self-correct over time^[10].

GBL also cultivates higher-order thinking skills, such as problem-solving and pattern recognition, through structured tasks like sentence sequencing, gap fills, and matching exercises, which deepen cognitive engagement^[19,20]. Furthermore, GBL aligns well with communicative language teaching (CLT) principles, encouraging peer interaction, collaboration, and shared knowledge construction through com-

petitive or cooperative gameplay^[21,22]. Drawing on self-determination theory, GBL tools such as *Word Wall* promote motivation by fulfilling learners' needs for autonomy, competence, and relatedness. Features such as immediate feedback, self-paced challenges, and goal-based activities make the learning process more meaningful and personalized^[23,24]. Empirical studies confirm that digital GBL tools can lead to measurable gains in language acquisition. For example, students using platforms like *Word Wall* often outperform peers in vocabulary and grammar assessments due to the engaging and repetitive nature of game-based learning^[25]. Moreover, when game mechanics align closely with pedagogical goals, the effectiveness of GBL significantly improves^[18,26].

However, despite these advantages, most existing studies have focused primarily on oral communication, vocabulary acquisition, and reading comprehension. The potential of GBL—specifically, tools like *Word Wall*—for enhancing writing development remains underexplored.

2.1. Research Gap

While the benefits of GBL for vocabulary and reading are well-documented, fewer studies have examined how *Word Wall* specifically supports writing development—such as vocabulary use, sentence structure, and idea organization^[27]. Few studies have quantitatively examined the direct impact of digital *Word Wall* activities on specific writing components such as organization and syntactic accuracy. Moreover, learners' perceptions of *Word Wall* in writing-focused contexts remain underexplored. This study addresses these gaps by investigating both the tool's impact on writing skills and students' experiences using it.

2.2. The Significance of the Study

This study contributes meaningfully to the expanding body of research on gamified learning in English as a Foreign Language (EFL) contexts by empirically evaluating the pedagogical potential of *Word Wall*, a digital game-based learning platform, in enhancing undergraduates' writing proficiency. Specifically, it provides evidence on how interactive tools can support the development of essential writing sub-skills, such as vocabulary retention, syntactic accuracy, and written fluency—skills that are integral to academic literacy in tertiary EFL instruction^[5,6].

The findings offer practical insights for educators seeking to improve learner engagement and performance through the integration of technology-mediated, interactive instructional strategies. Previous research has indicated that gamification in language education can stimulate intrinsic motivation, reduce language anxiety, and facilitate active learning^[15,28]. This study reinforces such claims by demonstrating the effectiveness of *Word Wall* in increasing student participation and fostering a more engaging learning environment.

To further enhance the rigor and validity of future investigations, the use of objective Manca performance measures—such as timed writing assessments, corpus-informed analysis, or automated scoring tools—is recommended to supplement self-reported data^[29,30]. Expanding the demographic scope to include diverse institutions and learner profiles would also strengthen the generalizability of the findings.

In addition, incorporating qualitative techniques, such as learner interviews, reflective journals, and classroom observations, may yield more profound insights into the affective and cognitive dimensions of learners' engagement with gamified tools^[31]. Furthermore, reporting effect sizes and confidence intervals alongside p-values can facilitate more accurate interpretation and application of results in educational settings^[32]. Addressing instrument sensitivity through more nuanced rubrics or analytic frameworks may also help capture subtle changes in writing performance, particularly in advanced learners who may experience ceiling effects^[33].

This study addresses a critical gap in the empirical literature concerning the use of digital game-based tools in EFL writing instruction and provides evidence-based recommendations for improving both instructional effectiveness and learner engagement.

3. Methodology

3.1. Research Design

This study adopted a mixed-methods research design, integrating quantitative and qualitative methodologies to explore the pedagogical efficacy of *Word Wall*, a digital game-based platform, in enhancing writing proficiency and learner engagement among female undergraduates studying English as a Foreign Language (EFL). The rationale for employing a

mixed-methods approach lies in its ability to generate a more nuanced and holistic understanding of the research problem by combining the strengths of statistical generalizability with the depth of contextual and experiential data^[34,35].

The study used structured Likert-scale questionnaires to understand how students feel about *Word Wall* activities^[36,37] and also evaluated their writing performance with rubrics^[29,38]. These instruments helped to find important trends and connections between participating in game-like tasks and certain writing skills, like learning new words, using correct grammar, and organizing ideas clearly.

Qualitatively, open-ended reflective questions were incorporated to elicit rich textual data concerning students' experiences and attitudes toward the integration of *Word Wall* in their writing instruction. Thematic analysis, guided by Braun and Clarke^[31] six-phase framework, enabled the identification of emergent themes that complemented and contextualized the quantitative findings.

This methodological triangulation enhanced the study's internal validity and allowed for cross-validation of results across data sources^[39]. Such a comprehensive design is particularly well-suited to educational research contexts, where the interplay between cognitive performance and affective-motivational factors is complex and multidimensional.

3.2. Participants and Sampling Procedure

The participants in this study consisted of 120 female undergraduates enrolled in Level 7 and Level 8 courses within the Department of Language and Translation at Northern Border University. The sampling table indicates that a minimum of 118 participants is sufficient to ensure statistical power and generalizability, based on population size and confidence levels^[40]. The actual sample slightly exceeded this threshold, comprising 73 students from Level 7 and 47 from Level 8.

A stratified random sampling method was employed to ensure proportionate representation across the two academic levels, thereby enhancing the internal validity of the study^[41]. Participants' ages ranged from 16 to 20 years. The stratification allowed for the systematic control of potential confounding variables related to academic seniority, such as varying exposure to academic writing conventions and differing levels of linguistic competence.

While the response rate was robust, the final sample was

marginally affected by non-responses and logistical constraints encountered during data collection. These limitations introduced a degree of uncertainty regarding the extent to which the final sample fully represented the broader target population. As non-response bias could potentially affect the external validity of the findings, future investigations are encouraged to conduct comparative analyses between respondents and non-respondents to assess potential sampling bias^[42].

3.3. Data Collection Instruments

Data for the present study were collected using a cross-sectional online questionnaire administered via Google Forms. The questionnaire aligned specifically with the investigation of *Word Wall* activities within the context of EFL writing instruction. The instrument comprised four comprehensive sections to ensure thorough data collection:

The perceptions of students regarding *Word Wall* activities were measured using seven items rated on a five-point Likert scale that ranged from "strongly disagree" to "strongly agree."

Three open-ended questions designed to elicit rich qualitative insights into students' personal experiences with *Word Wall* and their suggestions for potential improvements; and

A single-item global rating scale was employed to assess the overall perceived effectiveness of the *Word Wall* activities.

While self-report questionnaires are invaluable for capturing nuanced learner attitudes and perceptions^[43], exclusive reliance on such subjective measures may introduce biases, particularly social desirability bias^[44]. Subsequent studies should incorporate objective performance-based assessments to mitigate these limitations and enhance the validity and reliability of future research outcomes. These could include standardized writing tests, timed writing tasks, or rubric-guided evaluations^[29], utilized alongside self-reports. The application of methodological triangulation is essential to strengthen construct validity and facilitate a more comprehensive and accurate understanding of the effects of *Word Wall* on writing proficiency and learner engagement^[45].

3.4. Instrument Validation and Reliability Testing

To ensure methodological rigor and the credibility of the findings, this study employed a comprehensive validation

and reliability protocol for all data collection instruments. The primary tools utilized comprised a structured questionnaire designed to capture students' perceptions and a rubric-based framework employed to evaluate writing proficiency. These instruments were subjected to both qualitative and quantitative validation procedures in alignment with best practices in educational research and psychometric evaluation.

3.4.1. Validity of Instruments

Content validity was established through expert judgment. Two field specialists in English as a Foreign Language (EFL) pedagogy and language assessment critically reviewed the initial drafts of the perception questionnaire and the writing assessment rubric. Their feedback was instrumental in refining the wording, scope, and representational accuracy of each item to ensure alignment with the study's conceptual framework and research objectives. Revisions were made to enhance construct relevance, terminological clarity, and contextual appropriateness.

Following expert review, a pilot study was conducted with a sample of ten EFL students who shared demographic and academic characteristics with the target population. This phase served to evaluate item clarity, procedural feasibility, and participant comprehension. Insights from the pilot phase led to minor yet significant adjustments, further enhancing the usability and interpretive validity of the instruments.

Construct validity was supported through alignment with theoretical and empirical frameworks from established literature in second language writing and assessment^[6,29]. The internal coherence between participants' qualitative responses and the targeted constructs further confirmed the appropriateness of the measurement tools for capturing nuanced dimensions of writing proficiency and learner engagement^[44].

3.4.2. Reliability Testing

Instrument reliability was assessed using both internal consistency and inter-rater reliability metrics. The structured questionnaire underwent reliability analysis through Cronbach's alpha coefficients. The perception scales yielded high internal consistency scores— $\alpha = 0.839$ for the *Word Wall* activity dimension and $\alpha = 0.841$ for the writing skills dimension—both of which exceed the conventional acceptability threshold of 0.70^[46], indicating strong reliability and

internal cohesion among the items.

To ensure scoring reliability for the rubric-based writing assessments, inter-rater reliability was measured using Cohen's kappa. Prior to formal data collection, raters participated in calibration sessions to standardize scoring practices and minimize subjectivity. The resultant kappa value ($\kappa = 0.82$) demonstrated substantial agreement^[47], thereby confirming the robustness and reliability of the evaluative judgments across independent assessors.

3.4.3. Assessment of Measurement Consistency

The rubric's internal consistency was further corroborated by the elevated Cronbach's alpha values across its criteria—grammar, vocabulary, organization, coherence, and task completion—suggesting that these components collectively functioned as a cohesive and reliable composite measure of writing proficiency. This high level of consistency across raters and scoring dimensions lends additional confidence to the integrity of the writing assessment outcomes.

The validation and reliability procedures employed in this study—encompassing expert review, pilot testing, construct-theoretic alignment, and statistical reliability indices—collectively affirm the psychometric soundness of the instruments. These safeguards ensure that the tools accurately and consistently measured the constructs under investigation, thereby enhancing the trustworthiness of the data and reinforcing the study's methodological rigor. Future research may expand on this foundation by employing confirmatory factor analysis and incorporating longitudinal performance data to triangulate and further validate self-reported and rubric-based measures.

3.4.4. Writing Assessment and Inter-Rater Reliability

Students' writing proficiency was evaluated using a customized analytic rubric developed with reference to established EFL writing assessment frameworks. The rubric encompassed five core criteria: grammar, vocabulary, organization, coherence, and task completion. To enhance the validity of the rubric, it was reviewed by two subject-matter experts and piloted with a sample of ten students prior to its full implementation.

To ensure scoring reliability, evaluators underwent training sessions focused on rubric calibration and standardization of rating procedures. Inter-rater reliability was cal-

culated using Cohen's kappa ($\kappa = 0.82$), which reflects a substantial level of agreement among raters and supports the credibility of the assessment outcomes.

3.5. Quantitative Data Analysis

Quantitative data were analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics were computed to summarize demographic characteristics and participants' perceptions. The internal consistency of the Likert-scale items was confirmed using Cronbach's alpha ($\alpha = 0.87$), indicating high reliability.

Inferential analyses included one-way ANOVA and simple linear regression to examine the relationship between engagement in *Word Wall* activities and self-perceived improvement in writing proficiency. Cross-tabulations were performed to explore associations between demographic variables and overall effectiveness ratings.

It is important to acknowledge a limitation inherent in the use of self-reported Likert-scale measures, which may be susceptible to social desirability bias. Although efforts were made to preserve participant anonymity, future studies should consider triangulating self-reports with objective performance assessments or direct classroom observations to enhance measurement validity.

3.6. Qualitative Data Analysis

We analyzed the responses to the open-ended items through thematic analysis, which involved systematic coding, identification of recurring themes, and interpretation of response patterns. To bolster the credibility of qualitative findings, peer debriefing was conducted during the coding process to refine theme development and validate interpretations.

3.7. Limitations

A notable limitation of the study was a technical malfunction in the audio recording device during initial qualitative interviews, which resulted in partial loss of voice-recorded data. We reconstructed the affected qualitative input using participant notes and follow-up written responses as a mitigation strategy. This workaround, however, may have introduced minor biases or led to a loss of richness in some responses, which is acknowledged in the interpretation

of qualitative findings.

3.7.1. Methodological Rigor

To enhance the credibility, validity, and trustworthiness of the findings, this study employed methodological triangulation, integrating both quantitative and qualitative data sources. The study also adhered to transparent reporting of data collection procedures, analytical strategies, and limitations, thereby contributing to the overall rigor of the research methodology.

3.7.2. Statistical Reporting

Data on perceptions of *Word Wall* activities and students' writing skills were collected using self-report surveys with Likert scales. While this method offers practical advantages and yields valuable subjective insights, it is susceptible to social desirability bias, which may result in an overestimation of positive responses. To enhance the validity of future research, triangulation with objective data sources—such as direct assessments of writing performance or systematic observational measures—is recommended.

The correlation coefficient obtained ($r = 0.502$) reflects a moderate positive association between engagement in *Word Wall* activities and writing skill development, in alignment with Cohen's guidelines for interpreting effect sizes^[48]. To convey the precision of this estimate, it is advisable to report a 95% confidence interval (CI) for the correlation coefficient. For instance, a CI ranging from approximately 0.36 to 0.62 would suggest that the true population parameter likely lies within this moderate range, while also accounting for sampling variability.

The regression analysis yielded an R value of 0.502 and an R^2 value of 0.252, indicating that approximately 25.2% of the variance in writing scores is attributable to participation in *Word Wall* activities. Including a 95% CI for R^2 —for example, between 0.15 and 0.35—would give more details about the reliability and generalizability of this effect size. Complementary ANOVA results indicated a moderate effect size ($\eta^2 \approx 0.27$), suggesting a substantively meaningful influence of *Word Wall* engagement on students' writing performance. It is advisable to include confidence intervals for all reported effect sizes in supplementary materials to improve the transparency and interpretability of findings.

Furthermore, the regression coefficient suggests that each additional unit of engagement in *Word Wall* activities

corresponds to an estimated 0.32-point increase in writing scores. On a 1–7 scale, this represents a practically meaningful enhancement in writing outcomes, particularly among students who participate in multiple activities. Reporting the 95% CI for this coefficient (e.g., 0.219 to 0.419) would clarify the precision of this estimate and support more accurate inference.

Finally, it is important to acknowledge that the relatively high mean scores on both constructs (approximately 4.8–4.9) may indicate a ceiling effect, potentially constraining variability and attenuating observed relationships. This limitation, along with the inherent susceptibility of self-reported data to social desirability bias, should be carefully considered when interpreting and generalizing the present findings.

4. Results Interpretation

The regression model $\gamma = 2.281 + 0.319 \times (\text{Word Wall Activities})$ demonstrates a positive association between engagement in *Word Wall* activities and writing skills. The unstandardized coefficient ($B = 0.319$) indicates that, on average, each additional unit of participation in *Word Wall* activities is associated with an increase of approx-

imately 0.319 points in writing scores. To contextualize this finding, it is important to consider the measurement scale; for instance, if writing scores are assessed on a 1–7 Likert scale, this increment represents a meaningful enhancement in perceived writing proficiency, especially when multiple units of engagement are involved.

Additionally, the high mean scores (around 4.8–4.9) on both variables may suggest a ceiling effect, which could diminish the observed correlations and regression coefficients. Also, we should recognize that self-reported data might be influenced by social desirability bias, which can make people seem more positive and capable than they really are, thus affecting how widely we can apply the results.

4.1. Data Analysis

4.1.1. Stage One: Quantitative Analysis

Descriptive statistics in **Table 1** indicate that participants generally report high engagement with *Word Wall* Activities ($M = 4.79$, $SD = 0.36$) and perceive their writing skills favorably ($M = 4.93$, $SD = 0.14$). The low standard deviations suggest consistency across responses, yet the possibility of social desirability bias should be considered, particularly given the high mean scores. Future studies might incorporate objective measures of writing performance to complement self-perceptions.

Table 1. Descriptive statistics.

Description	Mean	Std. Deviation	N
<i>Word Wall</i> Activities	4.79	0.36	120
Writing Skills	4.93	0.14	120

Source: Developed by the author(s) based on collected data.

Reliability statistics in **Table 2** reveal Cronbach's alpha coefficients of 0.839 and 0.841 for the *Word Wall* Activities and Writing Skills scales, respectively, indicating excellent internal consistency. This reliability supports the scales' appropriateness for subsequent inferential analyses.

Model summary in **Table 3** shows $R = 0.502$ and $R^2 = 0.252$, with an adjusted R^2 of 0.246, suggesting a moder-

ate effect size as per Cohen's (1988) standards. Including a 95% CI for R^2 (e.g., 0.15 to 0.35) would provide additional context regarding the precision of this estimate.

ANOVA in **Table 4** confirms the significance of the regression model ($F(1,118) = 42.589$, $p < 0.001$). Reporting effect size measures such as eta squared ($\eta^2 = 0.265$) could further quantify the magnitude of this relationship.

Table 2. Reliability statistics.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of Items
0.839	0.841	7

Source: Developed by the author(s) based on collected data.

Table 3. Model summary.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.502	0.252	0.246	0.382

Note: Predictors: (constant), *Word Wall* activities; Dependent variable: writing skills.
Source: Developed by author(s) based on collected data.

Table 4. ANOVA.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18.725	1	6.242	42.589	0.000
2	Residual	55.690	118	0.147		
	Total	74.414	119			

Note: Predictors: (constant), *Word Wall* activities; Dependent variable: writing skills.
Source: Developed by author(s) based on collected data.

Regression coefficients in **Table 5** indicate a significant positive association ($\beta = 0.366$, $p < 0.001$). Presenting the 95% CI for the unstandardized coefficient (e.g., 0.219 to 0.419) would enhance understanding of the estimate's precision.

Table 5. Regression coefficients.

Model		Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
		B	Std. Error			
1	(Constant)	2.281	0.168		13.594	0.000
	WOWL	0.319	0.061	0.366	5.269	0.000

Note: Predictors: (constant), *Word Wall* activities; Dependent variable: writing skills.
Source: Developed by author(s) based on collected data.

Practical Implications: While the regression equation demonstrates that an increase of one unit in *Word Wall* activities correlates with approximately 0.319 points in writing scores, translating this into real-world educational significance requires considering the scale's range and the typical variation in student performance. For example, if the writing assessment ranges from 1 to 7, this increment could represent a notable improvement, especially when multiple units of engagement are achieved.

The statistical findings (e.g., $R = 0.502$, $R^2 = 0.252$) are appropriate for illustrating the strength of the relationships examined; however, their interpretation would benefit from a discussion of effect sizes and confidence intervals to provide a more nuanced view of the practical significance. While the p-values are consistently reported as less than 0.001 or 0.000, reporting precise p-values where available would enhance the transparency and informativeness of the results.

Regarding the regression analysis, the presented regression formula is clear; nonetheless, elaborating on its practical implications—such as quantifying the expected increase in writing scores associated with a specific increase in *Word*

Wall activities—would strengthen the interpretive depth. The high mean scores on Likert scales (approximately 4.8 to 4.9) suggest positive perceptions; however, these elevated scores may be influenced by social desirability bias. Acknowledging these variables as a potential limitation is recommended to contextualize the findings appropriately.

4.1.2. Stage Two: Qualitative Insights

The qualitative analysis employed a systematic thematic framework, grounded in Braun and Clarke's methodology, to explore students' perceptions and lived experiences with *Word Wall* activities^[31]. The initial coding process was inductive, deriving codes directly from participants' textual responses. These codes were subsequently organized into overarching themes and subthemes that encapsulated recurrent patterns across the dataset. To enhance transparency and credibility, illustrative quotations from participants were integrated alongside thematic descriptions, providing authentic voices that exemplify the identified patterns^[48].

To bolster the reliability of the coding process, inter-coder agreement was assessed via Cohen's kappa coefficient^[47], ensuring consistency between independent coders.

The coding procedures—including theme development, iterative refinement, and consensus discussions—were meticulously documented to facilitate transparency and enable future replication^[49].

4.1.3. Themes and Participant Quotations

Theme 1: Enhanced Vocabulary Acquisition

Participants reported that the *Word Wall* activities significantly facilitated vocabulary acquisition, contributing to improved lexical competence. One participant remarked, “Using the Word Wall helped me memorize new vocabulary quickly and confidently use it in my writing.” This perception aligns with existing literature emphasizing the efficacy of visual and contextual vocabulary tools in promoting lexical development^[5,50]. The integration of interactive vocabulary tasks appears to reinforce word retention and usage, thereby enhancing learners’ expressive and receptive language skills.

Theme 2: Increased Engagement and Motivation

Students frequently cited the interactive and game-based nature of the *Word Wall* as a motivating factor that increased their engagement in classroom activities. One respondent shared, “I looked forward to the games because they made learning fun and less stressful.” This aligns with studies that highlight the positive impact of gamification on learner motivation and affective engagement, particularly in language learning contexts^[9,26]. The incorporation of enjoyable and low-anxiety tasks is reported to sustain student interest and reduce the cognitive burden associated with traditional vocabulary learning.

Theme 3: Development of Autonomous Learning Skills

Participants indicated that the *Word Wall* activities supported the development of autonomous learning strategies, particularly through opportunities for independent review and practice. As one student noted, “I could review words outside class, which boosted my confidence in writing.” This observation resonates with theories of learner autonomy that emphasize the importance of self-regulated learning environments in fostering language proficiency^[51,52]. Such digital tools may thus serve as catalysts for promoting independent vocabulary acquisition and sustained linguistic confidence beyond the classroom setting.

Theme 4: Challenges and Limitations

Despite the overall positive reception, some participants identified practical limitations, particularly relating to technology access. One participant stated, “Sometimes, internet issues made it difficult to access the activities, which was frustrating.” This finding highlights a persistent challenge in digital learning environments—namely, the dependence on stable technological infrastructure^[53,54]. Recognizing these constraints is essential for evaluating the broader applicability and equity of such educational interventions.

4.2. Students’ Perceptions of Word Walls in Supporting Writing Skills

A survey administered to students at the seventh and eighth educational levels investigated their perceptions regarding the efficacy of *Word Wall* activities in improving writing proficiency within the EFL classroom. The results showed that 42% of students thought *Word Wall* activities helped make the classroom more engaging, which supports previous studies that highlight how interactive learning tools can boost student involvement and focus^[9,26] (Figure 1). Additionally, 46% of students said that these activities helped them learn on their own, supporting the idea that when students take charge of their learning, they usually improve their language skills over time.

Notably, specific design features such as clearly structured quiz instructions (acknowledged by 50% of respondents) and the provision of immediate feedback (endorsed by 54%) were positively received. These features match what research in computer-assisted language learning (CALL) shows, which says that clear task instructions and instant feedback are important for helping students improve their language skills and learn to edit their work effectively. Additionally, 38% of students reported increased confidence in using English, supporting the notion that scaffolded digital interventions can reduce anxiety and bolster learner self-efficacy^[55].

Signs of understanding showed the teaching value of the platform: half of the participants said they understood better, and 38% noticed improvements in their vocabulary—results supported by research that shows how effective rich, varied learning environments are for vocabulary growth. Furthermore, 54% of respondents expressed increased motiva-

tion, while 46% acknowledged the interactive and engaging nature of the platform as a facilitating factor in their learning. These responses affirm the broader pedagogical benefits of gamified and student-centered instruction^[56]. Although 33% of students raised concerns about internet data consumption, this issue did not significantly diminish the overall favorable perception of the *Word Wall* activities. Such technological constraints, while notable, are often regarded as manageable within the framework of blended or digitally enhanced EFL instruction^[57].

Analysis of student responses revealed a distinct prefer-

ence for interactive and gamified instructional formats within the context of language learning (**Figure 2**). The *gameshow quiz* emerged as the most favored activity, with 32% of participants identifying it as their preferred engagement method. This was followed by *True or False* (26%), *Match-Up* (19%), and *Word Search* (18%). In contrast, the *Maze Chase* activity was the least preferred, selected by only 5% of respondents. These findings suggest that interactive, competitive tasks—particularly those that incorporate elements of gamification—may be especially effective in capturing learner interest and enhancing the development of writing skills.

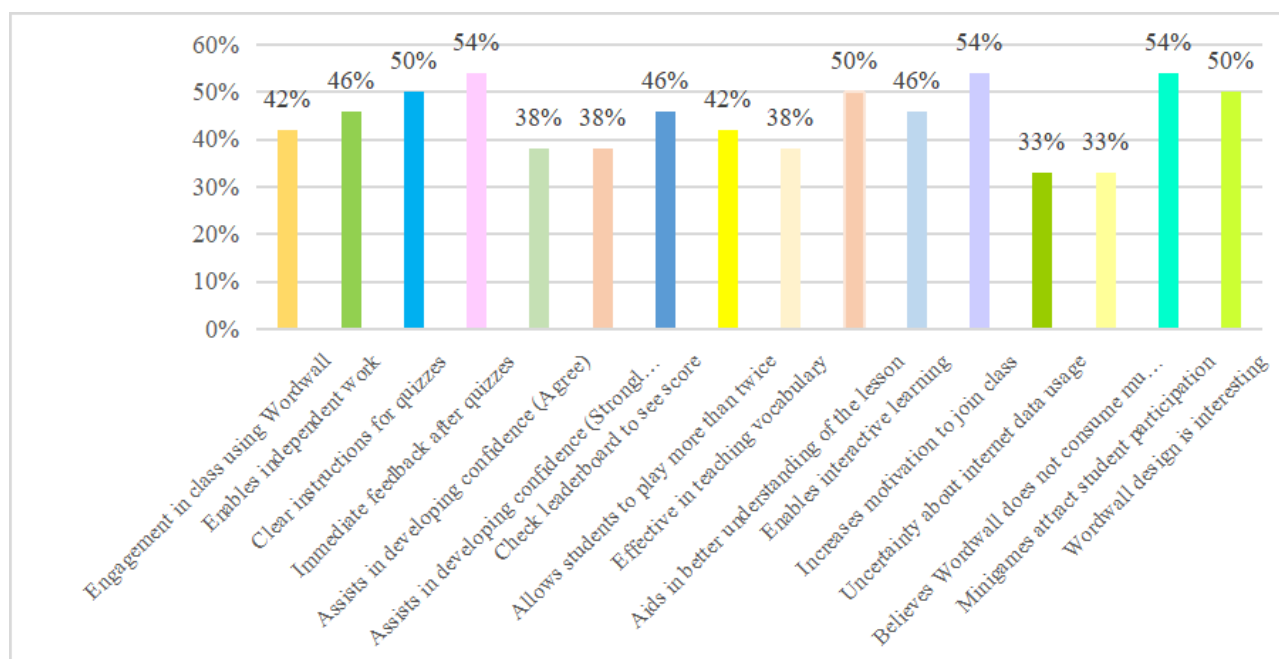


Figure 1. Students' perception of using *Word Wall* in the writing skill classroom.

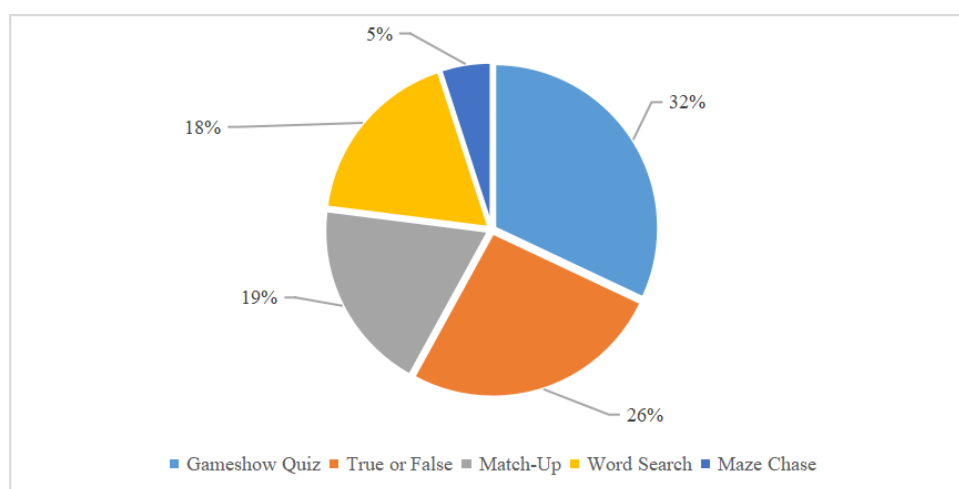


Figure 2. Students' preferences of *Word Wall* activities.

This preference aligns with prior research indicating that learning through games can significantly enhance students' motivation, sustain their attention, and support language acquisition by creating a stress-free and engaging learning environment^[19,26]. Digital game-based platforms have also been shown to make learners more willing to participate and take linguistic risks, which are both important for developing useful language skills, especially writing^[57,58]. The inclination toward such activities highlights the pedagogical benefits of integrating gamified strategies that combine enjoyment with sound instructional design. This balanced focus on affective engagement and academic rigor fosters more sustained participation and leads to improved language learning outcomes^[16].

4.3. Quantitative and Qualitative Findings

The quantitative analysis revealed a statistically significant and moderately strong relationship between engagement in *Word Wall* activities and students' writing performance, as indicated by an R^2 value of approximately 0.252. The result suggests that 25.2% of the variance in students' writing scores can be attributed to their participation in the *Word Wall* activities. While this figure represents a meaningful proportion of explained variance, reporting confidence intervals for the regression coefficients would enhance the interpretability and precision of the model's predictive capacity^[59,60]. Complementing the quantitative

findings, qualitative data derived from open-ended survey responses and interviews demonstrated high levels of student satisfaction and perceived usefulness of the *Word Wall* in improving writing skills. These perceptions were reflected in strong agreement on Likert-scale items and favorable overall activity ratings. The agreement between the qualitative and quantitative findings supports previous research that shows interactive vocabulary tools can positively affect writing skills and student engagement.

However, it is important to recognize that students might give answers they think are more socially acceptable when reporting their opinions, especially in studies about teaching methods^[47]. While the results show that teaching methods are effective, using different ways to gather information and keeping responses anonymous could help reduce bias and make the data more trustworthy.

4.4. Stage Three: Overall Effectiveness Ratings

Cross-tabulation data (Table 6) demonstrate overwhelmingly positive ratings of *Word Wall* activities. Of the 120 students across levels 7 and 8, 109 rated the activities as "Excellent" and 11 as "Good," indicating a high overall perceived effectiveness. Specifically, at Level 7, 66 students rated the activities as "Excellent" and 7 as "Good." At Level 8, 43 students rated "Excellent" and 4 as "Good." These findings support the conclusion that *Word Wall* activities are perceived as highly beneficial in enhancing students' writing skills.

Table 6. Overall rating.

Levels	Rating		Total
	Excellent	Good	
7	66	7	73
8	43	4	47
Total	109	11	120

Source: Developed by author(s) based on collected data.

5. Results and Discussion

This study employed a mixed-methods research design to investigate the impact of *Word Wall*, a digital game-based learning (DGBL) platform, on writing proficiency and learner engagement among 120 female undergraduate English as a Foreign Language (EFL) students at Northern Border University. The use of a stratified random sampling

technique ensured that the sample was demographically representative of the broader student population, thus enhancing the generalizability of the findings^[34].

Data were collected through three primary instruments: a structured Likert-scale questionnaire designed to capture students' perceptions of the intervention; open-ended reflective prompts that elicited qualitative insights; and a rubric-based writing assessment that evaluated five

core dimensions of writing proficiency—grammar, vocabulary, organization, coherence, and task achievement. The multidimensional assessment framework reflects current best practices in second language writing evaluation, which emphasize both linguistic accuracy and discourse-level competence^[6,29]. The quantitative instruments demonstrated strong psychometric properties. The questionnaire yielded high internal consistency, with Cronbach's alpha coefficients exceeding the conventional threshold of 0.83, indicating reliability and construct validity^[61,62]. In addition, inter-rater reliability for the writing assessments, calculated using Cohen's kappa (κ), reached a robust value of 0.82, denoting substantial agreement among raters^[47]. Quantitative data were analyzed using SPSS software, incorporating descriptive statistics, Pearson correlation coefficients to examine associations, and multiple linear regression analysis to determine the predictive power of *Word Wall* engagement on writing proficiency outcomes.

For qualitative data, thematic analysis was employed in accordance with Clarke's six-phase methodology, which included familiarization with the data, initial code generation, theme identification, theme review, theme definition and naming, and final report production^[31]. This analytical framework ensured a rigorous and transparent approach to data interpretation and allowed for the emergence of rich, nuanced themes reflective of learner experiences.

The integration of both quantitative and qualitative findings provides a holistic understanding of the pedagogical effectiveness of *Word Wall*. Quantitative results revealed statistically significant positive correlations between student engagement with *Word Wall* and improvements in writing scores, particularly in vocabulary use and task achievement. These findings are consistent with existing literature suggesting that digital game-based platforms can support second language development by promoting vocabulary retention, syntactic awareness, and learner autonomy^[5,57].

Qualitative data further substantiated these outcomes, with students frequently citing increased motivation, enjoyment, and self-efficacy as benefits of participating in the *Word Wall*-enhanced lessons. These affective variables are known to influence language performance, particularly in skill-based tasks such as writing^[63,64]. Overall, the integration of *Word Wall* into the instructional design was shown to foster both cognitive and affective gains in the EFL writing

classroom, underscoring the value of DGBL tools in higher education language contexts.

5.1. Quantitative Findings

The statistical analysis revealed a moderate positive correlation between engagement with *Word Wall* activities and writing proficiency scores (Pearson's $r \approx 0.50$; $R^2 \approx 0.25$). This indicates that approximately 25% of the variance in students' writing performance could be attributed to their level of participation in the digital platform. These findings align with prior research highlighting the effectiveness of digital game-based learning (DGBL) tools in enhancing second language writing through increased lexical exposure and interactive task repetition^[57].

A multiple linear regression analysis further demonstrated that each additional completed *Word Wall* activity was associated with an average increase of 0.32 points on a 7-point writing proficiency scale. This statistically significant gain underscores the platform's potential to support incremental improvement in writing skills, particularly in contexts where repetitive and interactive learning fosters skill automatization and lexical fluency^[5]. Participants also reported high levels of satisfaction with the platform. Likert-scale ratings of perceived effectiveness ranged from $M = 4.8$ to 4.9 (out of 5), suggesting a consistently strong positive perception of *Word Wall*'s educational utility. These responses reinforce the importance of learner engagement and perceived enjoyment in facilitating more profound language learning, as emphasized in second language acquisition research^[9,65].

Descriptive analysis showed that between 42% and 54% of respondents believed the tool significantly enhanced their vocabulary acquisition, intrinsic motivation, and overall engagement with language learning tasks. These findings are consistent with previous studies indicating that gamified learning environments contribute positively to learners' affective variables and performance outcomes^[19,30].

5.2. Qualitative Insights

Thematic analysis of students' open-ended responses revealed four principal themes:

- Students frequently cited vocabulary enhancement as a

direct outcome of engaging with *Word Wall*, corroborating findings from prior studies^[66].

- Many participants highlighted the gamified nature of the platform as a source of increased motivation and enjoyment, which in turn fostered active classroom participation.
- The platform's flexibility was praised for facilitating self-paced vocabulary review beyond classroom settings, thereby supporting autonomous learning aligned with self-directed education principles^[2].
- Despite the overall positive reception, some participants reported encountering challenges such as limited internet access and mobile data restrictions, which occasionally hindered platform usage^[67].

5.2.1. Student Perceptions and Preferences

Figure 3 illustrating participants' responses exhibited a predominantly positive attitude toward the integration of *Word Wall* activities within their writing instruction. Over 90% of respondents rated their experience as either "Excellent" or "Good," reflecting widespread satisfaction with the platform's pedagogical utility. This high level of acceptance is consistent with extant research emphasizing the motivational benefits of digital game-based learning tools in language education^[68].

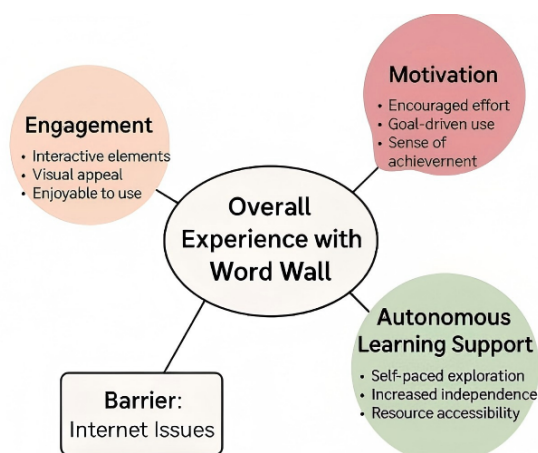


Figure 3. Student perceptions of the *Word Wall* tool.

Among the various interactive formats offered, the *gameshow quiz* emerged as the most favored activity, selected by 32% of students. This preference aligns with prior findings suggesting that competitive and gamified learning environments can effectively enhance learner engagement and promote sustained participation^[69]. Students frequently

reported that the interactive and gamified elements of *Word Wall* increased their willingness to engage with writing tasks and fostered greater intrinsic motivation, which are critical factors for successful second-language acquisition and skill development^[9,23].

5.2.2. Limitations

We should acknowledge several limitations. First, the sample was homogeneous, consisting solely of female students from a single Saudi Arabian university, thereby limiting the generalizability of the findings. Second, the use of self-reported data introduces the possibility of response bias. Third, the cross-sectional design restricts the capacity to infer long-term causal relationships. Future research should consider employing longitudinal designs, incorporating more diverse and representative populations, and utilizing objective performance-based assessments to more rigorously evaluate the sustained impact of digital game-based platforms on language acquisition.

5.3. Implementation of *Word Wall* Activities

The implementation of *Word Wall* activities followed a structured and pedagogically grounded instructional framework. Each session commenced with a concise teacher-led demonstration in which the learning objectives and procedural steps were explicitly outlined to ensure learner clarity and task orientation. This initial scaffolding phase aligns with Vygotsky's sociocultural theory, which emphasizes the role of guided instruction in advancing learner competence through the zone of proximal development^[70]. Following the introductory phase, students participated in various interactive tasks, either individually or in small collaborative groups, encouraging both independent learning and peer-mediated interaction^[71].

The instructional tasks incorporated a diverse range of vocabulary-focused activities, including matching exercises, quizzes, crossword puzzles, and interactive digital games. These tasks were strategically designed to reinforce vocabulary acquisition and enhance writing proficiency, supporting the lesson's overarching communicative and linguistic goals. Such task-based approaches to vocabulary learning are supported by research indicating that active engagement with lexical items across multiple modalities significantly enhances retention and transfer^[5,51].

Throughout the implementation, the teacher assumed a facilitative role by providing immediate formative feedback, addressing conceptual misunderstandings, and offering real-time scaffolding. This approach has been shown to be effective in maintaining learner motivation and ensuring cognitive engagement, particularly in environments that demand sustained attention and self-regulation^[72,73]. Active teacher mediation during digital learning has also been linked to improved student outcomes in game-based environments^[19].

Each session concluded with a structured debriefing, during which students engaged in reflective discussions to consolidate newly acquired knowledge, clarify uncertainties, and establish links between activity content and broader language development objectives. These reflective practices are essential for metacognitive development and contribute to long-term learning gains^[74,75].

The integration of *Word Wall* activities into the curriculum served multiple pedagogical functions: activating prior knowledge, reinforcing and consolidating vocabulary, enabling continuous formative assessment, and preparing students for summative tasks. The interactive, game-based design of the platform fostered learner engagement, supported vocabulary retention, and promoted increased confidence in written expression—aligning well with the intervention’s objective to explore the efficacy of digital game-based tools in language education. These findings affirm the value of intentional instructional design and digital integration in fostering meaningful learning experiences in the EFL classroom^[54,65].

5.4. Technological Access Challenges and Potential Mitigation Strategies

Technological barriers, particularly inconsistent internet connectivity, hinder the effective implementation of digital game-based learning platforms, such as *Word Wall*, in higher education contexts^[76,77]. Limited or unreliable internet access may impede students’ ability to fully engage with interactive learning activities, thereby restricting the potential benefits of these digital tools. This study acknowledges these access constraints and underscores the necessity for practical solutions to foster equitable and uninterrupted participation.

Several strategic approaches are proposed to address these technological limitations. First, the development of of-

fline or low-bandwidth versions of *Word Wall* activities could substantially reduce reliance on continuous internet connectivity, enabling learners to access materials asynchronously and without connectivity disruptions^[78]. Such downloadable resources would facilitate uninterrupted engagement, especially in regions with intermittent internet service.

Second, adopting a blended learning framework that integrates digital tasks with traditional offline activities, such as printed vocabulary exercises or in-person classroom games, may provide a balanced pedagogical approach that mitigates the impact of connectivity issues^[79]. This approach not only ensures continuity of learning but also caters to diverse learner preferences and technological realities.

Institutional support emerges as another critical factor. The provision of robust infrastructure, including reliable campus Wi-Fi, dedicated computer labs, and Wi-Fi hotspots, is imperative to bridge access gaps^[80]. Facilitating access through alternative devices with superior network capabilities or pre-loading digital content onto student devices also represents viable interim measures.

Lastly, implementing flexible access schedules, such as enabling students to engage with *Word Wall* activities during off-peak hours or providing asynchronous options, can alleviate bandwidth congestion and enhance user experience.

Addressing technological access challenges requires a multifaceted strategy encompassing the development of offline-compatible materials, blended learning modalities, enhanced institutional infrastructure, and flexible user access protocols. Future research should empirically evaluate the effectiveness of these interventions to promote equitable access and optimize the pedagogical impact of digital learning platforms in diverse educational environments.

6. Conclusion

This study affirms the positive impact of *Word Wall*, a digital game-based learning platform, on undergraduate EFL students’ writing proficiency and classroom engagement. Quantitative data revealed significant improvements in vocabulary acquisition, grammatical accuracy, and writing fluency, corroborating prior findings on the effectiveness of interactive tools in language development^[81]. Qualitative insights also indicated increased learner motivation and self-confidence, echoing research on the affective benefits

of game-based instruction^[57].

To maximize pedagogical effectiveness, educators should integrate *Word Wall* into authentic, extended writing tasks and tailor activities to students' proficiency through differentiated scaffolding^[7]. Embedding *Word Wall* within thematic vocabulary instruction and formative assessment frameworks may enhance curricular alignment. Additionally, professional development in digital literacy and task design is recommended to mitigate implementation challenges and improve instructional efficacy^[82].

Future research should explore the longitudinal effects of such interventions on writing development, particularly regarding vocabulary retention and fluency. Comparative studies across educational contexts and platforms are needed to identify the most effective game-based features. Key research questions include the impact of sustained *Word Wall* engagement on long-term writing outcomes and the differential effects of game types on vocabulary use and syntactic complexity. These inquiries will deepen understanding of the systematic use of digital tools in second language writing instruction.

Author Contributions

Conceptualization, R.J.; methodology, R.J.; writing—original draft preparation, R.J.; writing—review and editing, Y.A.; visualization, Y.A.; supervision and editing, S.G. All authors have read and agreed to the published version of the manuscript.

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The study data were collected from all participants.

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Conflicts of Interest

The authors declare that there is no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

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