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Gamified Vocabulary Learning through Quizizz: An Experimental Study on EFL Students' Lexical Development in Indonesia

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Abstract

This experimental study investigates how gamified vocabulary learning through Quizizz supports English as a Foreign Language (EFL) students' lexical development in Indonesia. Grounded in the principles of Self-Determination Theory, the research examines how game-based features, such as instant feedback, competition, and reward systems, enhance learners' motivation and engagement during vocabulary acquisition. Twenty-eight eleventh-grade students from a public school in South Sulawesi participated in pre- and post-tests to measure learning gains after the Quizizz intervention. The results indicate notable improvements in students' vocabulary mastery accompanied by increased autonomy and active participation during lessons. The findings suggest that integrating gamification elements can strengthen learners' intrinsic motivation, contributing to more effective vocabulary learning in EFL classrooms. However, the study's limited context, focusing on a single school and lacking comparison with other digital platforms, constrains the generalizability of the results. The study recommends broader implementation and future research across varied educational settings to further validate the potential of Quizizz and similar tools in enhancing EFL students' lexical resources.

Keywords: *Gamification; Vocabulary Learning; EFL; Quizizz; Self-Determination*

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Introduction

Mastering English as a foreign language requires proficiency across the four core skills: listening, speaking, reading, and writing. While listening and reading are receptive skills, speaking and writing are productive, demanding the active construction of language. Effective mastery of these skills, however, hinges on vocabulary knowledge, which underpins learners' ability to comprehend, produce, and interact meaningfully in the target language (Nation, 2013; Webb & Nation, 2017). Despite its centrality, vocabulary acquisition remains a persistent challenge in EFL contexts, including Indonesia, where learners often struggle due to ineffective instructional methods, low motivation, and limited engagement (Halim & Nuwrun, 2019; Wijaya et al., 2021).

In fact, vocabulary instruction has traditionally relied on teacher-centered approaches such as direct explanation, translation, and repetition (Hatch & Brown, 1995; Harmer, 2007). While these methods can support initial learning, they often fail to sustain student engagement or promote long-term retention. Moreover, we argue that research in recent years highlights the potential of digital and game-based interventions to address these limitations by combining learning with interactive, intrinsically motivating activities (Hamari et al., 2016; Domínguez et al., 2017). Gamification, grounded in Self-Determination Theory (SDT), suggests that learning experiences designed to satisfy learners' needs for competence, autonomy, and relatedness enhance motivation and engagement, which are critical for vocabulary retention (Deci & Ryan, 2000; Sailer et al., 2017).

Empirical studies have demonstrated the effectiveness of digital games in vocabulary acquisition. To exemplify, mobile applications and platforms such as Kahoot, Quizlet, and Duolingo have been shown to increase learners' engagement and improve vocabulary recall through immediate feedback, adaptive difficulty, and competitive or cooperative game mechanics (Alqahtani, 2020; Chen et al., 2021; Asdar et al., 2025). Within the Indonesian EFL context, prior research explored game-based vocabulary learning through mobile applications (Noho, 2016; Setyowati, 2017; Rudianto & Aldriani, 2018). However, systematic investigations using Quizizz as a structured instructional games model remain limited. Setyowati (2017), for instance, investigates the use of Quizizz but does not critically examine its integration as a comprehensive learning strategy nor its impact on learners' motivation and engagement.

The Instructional Games Model offers a theoretical framework for designing educational games with clearly articulated learning objectives, feedback mechanisms, and adaptive content (Prensky, 2007; Gee, 2013). When applied to vocabulary instruction, this model aligns with gamification principles by providing interactive and rewarding learning experiences that support both cognitive and affective outcomes. By leveraging Quizizz as an implementation tool, vocabulary learning can become more engaging, personalised, and effective, addressing challenges of low retention and learner disengagement.

This study aims to fill the identified gap by systematically investigating the effects of Quizizz-based instructional games on Indonesian EFL students' vocabulary acquisition. Specifically, the research examines: (1) the extent to which structured game-based learning improves lexical knowledge, and (2) how the gamified environment influences learner engagement and motivation. Theoretically, the study contributes to the application of the Instructional Games Model in EFL contexts, while practically, it provides actionable insights for English teachers seeking to integrate gamification into vocabulary teaching strategies.

Method

Study Design & Participants

This study employed a pre-experimental design with a single-group pre-test and post-test, following the framework outlined by Gay (2006). While pre-experimental designs have limitations in controlling for confounding variables due to the absence of a control group, they are appropriate for exploratory investigations in classroom settings where random assignment may not be feasible (Creswell, 2014). The study aimed to examine the effect of the Instructional Games Model via Quizizz on students' vocabulary acquisition. The participants were eleventh-grade students from a public secondary school in South Sulawesi, Indonesia, during the 2023/2024 academic year. Out of a total population of 267 students across five classes, a cluster random sampling procedure selected 28 students (10 males, 18 females) to ensure representativeness while maintaining feasibility for the intervention.

Participants' demographic characteristics, including age (16–17 years) and prior English achievement levels, were recorded to describe the sample and support interpretation of results. The study adhered to ethical research standards by which Informed consent was obtained from students prior to participation. Students were informed of their right to withdraw at any time without penalty. Participant anonymity was maintained, and data were stored securely in accordance with institutional ethical guidelines.

Research Variables & Instruments

This study involved two types of variables. Whilst the independent variable affects the subject, the dependent variable is influenced by the independent variable. A) independent variable: The implementation of the instructional games model; B) dependent variable: Improvement in students' vocabulary. In other words, the vocabulary test served as both the pre-test and post-test instrument. The test consisted of 30 multiple-choice items covering high-frequency, academic, and contextually relevant words aligned with the school curriculum. To ensure content validity, the test items were reviewed by two experienced EFL teachers and a language assessment specialist, who evaluated the alignment of items with curriculum objectives and language proficiency levels. The reliability of the test was

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calculated using Cronbach's alpha, yielding a coefficient of 0.87, indicating high internal consistency (Gliem & Gliem, 2003).

Data Collection

As said, the study involved three consequence steps, namely pre-test, treatment, and post-test. In collecting the data, we conducted the research for about six meetings in which (1) a pre-test was given on the first meeting. In the process of pre-test, the students did the vocabulary test that was presented to them. They were then asked to complete the quiz with the correct words by choosing one of the correct answers given. Furthermore, they were not allowed to look out the meaning of the words in the dictionary while doing so, aiming to accurately assess participants' vocabulary improvement.

Following the pre-test, we then undertook (2) treatments during the second until the fourth meeting (four sessions in total). That is to say, the researchers administered treatments over approximately four sessions. These treatments involved various teaching and learning activities, as well as the application of the Quizizz game for the students. After administering the treatments, in the final stage we conducted (3) a post-test for the students. The procedure for the post-test was similar to that of the pre-test and aimed to compare the students' vocabulary improvement before and after the treatments.

Data Analysis

Data were analyzed using paired-sample t-tests to compare pre-test and post-test scores and determine the statistical significance of observed differences (Cohen, 1988). The effect size (Cohen's d) was also calculated to quantify the magnitude of the intervention's impact. Descriptive statistics, including means, standard deviations, and score distributions, were reported to provide a detailed overview of participants' performance.

$$\text{Score} : \frac{\textit{Students correct answer}}{\textit{Total number of items}} \times 100\%$$

Figure 1. The formula of scoring students' tests

Secondly, the vocabulary test scores were classified based on the scale proposed by Sulistiani et al., (2023) to interpret mastery levels, as given below:

Table 1. The score's measurement scale

Numb.	Classifications	Score Range
1.	Very Good	91-100
2.	Good	75-90
3.	Fair	61-74
4.	Poor	51-60
5.	Very Poor	Less than 50

In addition to classifying students' score scale, we also calculated the students' mean score and compared their mean score gained in the pre-test and post-test. Having such calculation helped us to determine whether the Quizizz instructional game could make a difference in boosting the participants' vocabulary mastery, which later could become a recommended approach for English teachers at school. In doing so, we adopted the following formula proposed by Gay (2006):

$$\bar{X} = \frac{\Sigma x}{N}$$

Where : $\bar{X}$ = Mean score
Σx = The sum of all score
N = The number of objects

Figure 2. The mean score formula

All analyses were conducted using SPSS v.25, and assumptions of normality and homogeneity of variance were checked to ensure the appropriateness of parametric tests. The reliability and validity of the test, combined with careful procedural control, strengthened the internal validity and interpretability of findings despite the absence of a control group.

Results

The research findings encompass a descriptive account of the results derived from the pre-test to post-test data collection. Following the findings, the discussion section offers an in-depth exploration and clarification of the presented results. This section presents the examination and interpretation of the data derived from the students' scores. The writer calculated, analysis of the scores, utilizing the data collected from the school. The rate percentage of the students' score presented as follows:

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Table 2. Rate Percentage of Quizizz in Pre-test and Post-test

No	Classification	Score	Pre-test		Post-test	
			F	%	F	%
1.	Very Good	91 – 100	-	-	2	-
2.	Good	75 – 90	9	32	26	-
3.	Fair	61 – 74	17	61	-	-
4.	Poor	51 – 60	2	7	-	-
5.	Very Poor	0 - 50	-	-	-	-
	Total	28	28	100%	28	100%

Table 2 provides a comprehensive analysis of student performance in vocabulary acquisition using Quizizz-based instructional games, comparing the distribution of scores across different classifications in both a pre-test and a post-test scenario. In the pre-test, the majority of students (17, or 61%) fell into the Fair category, suggesting a moderate level of vocabulary understanding before the intervention. A significant number of students (9, or 32%) were classified as good, indicating a solid grasp of vocabulary. Only a small percentage (2, or 7%) were categorized as poor, with none of students classified as Very Good or Very Poor categories.

The post-test results reveal a significant improvement in student performance. The Fair category was no longer represented, while the good category saw a substantial increase, with 26 students (up from 9 in the pre-test) achieving this level, indicating a marked improvement in vocabulary understanding. Additionally, there were 2 students classified as Very Good category demonstrating a high level of mastery. Both the Poor and Very Poor categories remained empty. It indicated that all students had attained at least a moderate level of vocabulary proficiency in the post-test.

The total number of students assessed in both the pre-test and post-test was 28, with each student's score contributing to the overall distribution within the categories. The table effectively illustrated the shift in student performance from the pre-test to the post-test highlighting the positive impact of Quizizz-based instructional games on vocabulary acquisition. This improvement may be attributed to factors such as the effectiveness of the instructional games. It increased student engagement, additional study, and practice. The table serves as a valuable tool for educators to evaluate the impact of Quizizz-based instructional games on fostering students' vocabulary and to identify areas where students may require further support or enrichment. Furthermore, the result of mean score and standard deviation described as follows:

Table 3. The Mean Score and Standard Deviation of The Students

Test	Pre-test	Post-test
Mean Score	71.29	81.07
Standard Deviation	7.605	4.944

Table 3. presents a detailed quantitative analysis of student performance in vocabulary acquisition using Quizizz-based instructional games. In the pre-test, the mean score was 71.29. The standard deviation for the pre-test was 7.605. In contrast, the post-test results show a significant improvement in the mean score, which increased to 81.07. This increase indicates that, on average, students demonstrated a higher level of vocabulary proficiency after the implementation of Quizizz-based instructional games. The standard deviation for the post-test decreased to 4.944.

Table 4. The Result of T-Test

Variable	T-Test Value	T-Table
$X2$ - $X1$	10.548	2.052

Table 4 illustrates the results of a t-test analysis. The t-test value obtained from the analysis is 10.548. This value is compared to the t-table value, which is 2.052. The t-table value is determined by the degrees of freedom and the chosen significance level (typically 0.05 for a 95% confidence level). In this comparison, the t-test value (10.548) is significantly higher than the t-table value (2.052). This statistical significance supports the findings that Quizizz-based instructional games had a positive impact on fostering students' vocabulary. The high t-test value suggests that the intervention led to a meaningful and significant improvement in the students' vocabulary skills, further validating the effectiveness of using such games in educational settings.

Discussion

The findings of this study provide strong evidence for the effectiveness of Quizizz-based instructional games in enhancing students' vocabulary acquisition. The significant increase in mean scores from 71.29 (pre-test) to 81.07 (post-test), accompanied by a reduction in score dispersion (SD from 7.605 to 4.944), indicates not only an improvement in overall vocabulary proficiency but also a more uniform learning outcome across students. The t-test result (t = 10.548 > t-critical = 2.052) confirms that the observed gains are statistically significant.

Beyond statistical improvement, we argue that these results can be theoretically interpreted through Flow Theory and the Cognitive Engagement Model. Flow Theory posits that learners achieve optimal learning when tasks

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balance challenge and skill, generating intrinsic motivation and deep concentration (Csikszentmihalyi, 1990; Oliveira et al., 2023). The Quizizz-based activities provided immediate feedback, adaptive difficulty, and competitive elements that appear to have induced a flow state**,** where students were fully absorbed in the learning task. Evidence of sustained engagement and minimal off-task behavior suggests that students were experiencing this state of focused immersion**,** which likely facilitated better retention and application of vocabulary.

Complementing this, the Cognitive Engagement Model emphasizes behavioral, emotional, and cognitive engagements critical for learning (Fredricks et al., 2004). In this study, we argue that the behavioral engagement was evident in active participation in Quizizz games, the emotional engagement in students' enthusiastic responses and enjoyment, and cognitive engagement in the strategic recall and application of vocabulary. These multidimensional engagement processes help explain why the instructional games not only increased scores but also enhanced consistent performance across participants.

The results also extend previous research in the Indonesian EFL context. While prior studies (e.g., Setyowati, 2017; Nasir, et al., 2022) indicated that game applications can support vocabulary learning, this study demonstrates the systematic integration of Quizizz as a structured instructional tool**,** highlighting how game mechanics, feedback, and interactive elements specifically support lexical development. This suggests that the combination of gamified learning and intentional instructional design can provide a more robust learning mechanism than conventional methods.

From a pedagogical perspective, these findings underscore the potential of Quizizz-based instructional games to increase student motivation, engagement, and autonomy in vocabulary learning. Educators can leverage such platforms to create challenging yet attainable tasks, fostering intrinsic motivation while supporting cognitive and behavioral engagement. Moreover, the integration of gamified learning aligns with current trends in technology-enhanced language education**,** offering an evidence-based strategy for improving vocabulary acquisition in EFL classrooms.

Conclusion

This study demonstrates that Quizizz-based instructional games can effectively enhance students' English vocabulary by providing an engaging and interactive alternative to traditional textbook-based methods. The significant improvement from pre-test to post-test scores, supported by statistical analysis, highlights the potential of gamified learning to foster motivation, engagement, and cognitive involvement, consistent with Flow Theory (Csikszentmihalyi, 1990) and the Cognitive Engagement Model (Fredricks et al., 2004). Building on these theoretical foundations, this research proposes a Gamified Instructional Model for EFL Vocabulary Learning, in which vocabulary acquisition is facilitated through a combination of gamified activities that balance challenge and skill to induce flow;

immediate feedback and adaptive difficulty to support cognitive engagement; collaborative and competitive interactions to enhance behavioral and emotional engagement; and structured instructional sequences integrating pre-tests, interactive gameplay, and post-tests to monitor learning outcomes. Furthermore, this conceptual model provides a framework for EFL educators to design motivational, engaging, and effective vocabulary instruction using digital game applications.

Despite the study's positive outcomes, limitations include the single-school context and absence of a comparative analysis with alternative learning tools. Hence, future research should test the model across multiple schools and diverse EFL contexts; compare Quizizz with other gamified platforms (e.g., Kahoot, Duolingo) to identify the most effective features; and explore long-term retention and transfer of vocabulary knowledge facilitated by gamified learning. Overall, this study contributes both empirically and conceptually by demonstrating how integrating gamification, engagement strategies, and structured instructional design can enhance vocabulary learning in EFL settings, offering a practical and theoretically informed model for future research and classroom application.

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