



## **Gamified Vocabulary Learning through Kahoot and Quizizz: Effects on EFL Students Engagement and Retention**

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### **ABSTRACT**

This study investigates the effects of gamified vocabulary learning using Kahoot and Quizizz on EFL university students' engagement and vocabulary retention. Grounded in Self-Determination Theory and cognitive learning theories, the study employed a quasi-experimental pre-test-post-test non-equivalent group design involving 293 non-English-major students enrolled in general English courses at an Indonesian public university. The experimental group received vocabulary instruction through Kahoot and Quizizz, while the control group was taught using conventional vocabulary exercises. Data were collected through vocabulary tests administered at three stages (pre-test, post-test, and delayed post-test), an engagement questionnaire measuring behavioral, emotional, and cognitive engagement, classroom observations, and semi-structured interviews. Quantitative data were analysed using t-tests, one-way ANOVA, repeated-measures ANOVA, and Pearson correlation, while qualitative data were thematically analysed to support interpretation. The findings revealed that students exposed to gamified instruction achieved significantly higher vocabulary gains and demonstrated stronger long-term retention than those in the control group. The experimental group also reported significantly higher levels of engagement across all dimensions. A strong positive correlation was found between engagement and vocabulary retention, indicating that engagement played a mediating role in learning outcomes. The study concludes that pedagogically designed gamified vocabulary learning enhances both engagement and sustainable vocabulary retention in EFL higher education contexts.

**Keywords:** EFL students, engagement, gamification, kahoot, quizizz, vocabulary learning

### **INTRODUCTION**

Vocabulary is the cornerstone of all language abilities. It lays the groundwork for students to become good listeners, speakers, readers and writers of a second language. As recommended by Nation (2020) and Webb and Nation (2021), vocabulary knowledge is a strong predictor of learners' communicative ability and general success in learning English as a Foreign Language contexts. However, among university students (especially those who do not major in English), vocabulary learning continues to be one of the most difficult areas in language learning. "When to use the dictionary:" During the surveys, students frequently mentioned that they find it difficult to remember new vocab, don't enjoy being taught vocab, and are prone to forget vocab quickly because rote learning is not an efficient memorization strategy (Schmitt, 2020; Thornbury & Slater, 2021). These issues are particularly evident in mainstream English instruction, when students' motivation and focus on language detail may be constrained by competing subject area demands.

To address these enduring challenges, educators have incorporated gamification—meal design lending game elements like points, badges, leaderboards and limited-time challenges into the practice of learning. It has been discovered that gamification increases learners' motivation, participation and enjoyment (Riar et al., 2022; Hadi Mogavi et al., 2022). In the domain of EFL learning, game-based tools like Kahoot! and Quizizz being especially popular. They offer instant feedback, create an atmosphere of competition and cooperation, and involve direct participation in vocabulary learning (Singh Swaran Kaur et al., 2020; Rahayu et al., 2024). They change the endless vocabulary drill into a fast and challenging interactive game that fits with the digital life of students.

Empirical evidence that has been emerging reflects the pedagogical values of these platforms. Reynolds-Taylor (2020) found university students participating in a Kahoot-based vocabulary instruction lesson exhibited more enthusiasm and better recall of target words. Also, a work by Del España-Delgado et al. (2023) observed that in a comparison between Kahoot, Quizizz and Quizalize all three tools positively affected vocabulary retention and motivation, but with the highest engagement scores for Kahoot. In a similar study, Pham (2023) found that Vietnamese EFL and preparation for the IELTS learners who used Quizizz over 10 weeks outperformed their counterparts tested on grammar and vocabulary. García-García et al.'s (2005) work in Spanish higher education (2022) also found that participants who had learnt via Kahoot retained the content more so over time.

In addition to performance effects, gamified devices have been associated with increased emotional and behavioural engagement. Students indicated that game-based platforms are “fun”, lower anxiety, and foster competitive collaboration (Rizkiawati, 2024; Efendi, 2025). These results are congruent with self-determination theory that highlights the role of autonomy, competence and relatedness in sustaining motivation for learning (Ryan & Deci, 2020). But, as recent meta-analyses warn us, the effect of gamification is not uniform. Bulger (2022) and Looyestyn et al. (2021) observed that although gamified setups frequently promote temporary motivation, their impacts on longer term retention are less clear after novelty has worn off. Some other studies showed that a quiz-style games would no favor to competitive learners or some students may be experiencing with pressure and distraction which are likely to limit the amount of deep processing (Plump & LaRosa, 2020; Bai et al., 2022).

However, there remain gaps in the research. First, studies that have been carried out among English-majors or secondary school students might have had relatively strong basics in language and higher motivation to learn vocabulary. Much less has been researched on how gamification affects non-English-major students who study general English at university with potentially different levels of engagement and perceived relevance of English. Second, many studies have been oriented to immediate vocabulary tests scores, while the retention (the ability to retain the words in weeks after learning) has been much less studied (Febriani et al., 2024). Since long-term vocabulary retention is essential for communicative effectiveness, this oversight is a meaningful gap in the research. Third, comparative studies of Kahoot and Quizizz are limited, and there is no clear indication whether one favors encouraging greater engagement or retention than the other.

In light of these gaps, the current research investigates the impact of gamified vocabulary learning via Kahoot and Quizizz on engagement and retention in EFL university students taking general English courses. In particular, the study aims to compare (1) students' levels of engagement when acquiring vocabulary using Kahoot and Quizizz and (2) their retention of acquired words in delayed post-tests on both platforms. Because the informants are non-English-major students who perceive English as a required course, they

form an under-represented group whose attitudes toward learning English are generally affected by an instrumental orientation rather than integrative motivation.

This study's originality comes from being one of the first studies to focus specifically on both engagement and retention, comparing two widely-used gamification platforms as well as being set in the context of non-English-major university students. Although prior research has confirmed the motivational advantages of gamified software, our study further contributes to the topic by establishing a link between engagement quality and vocabulary retention results. By combining these perspectives, it attempts to add to the developing literature on technology-enhanced language learning from both a theoretical and pedagogical viewpoint and presents empirical evidence for EFL educators who are trying to balance fun/effective vocabulary learning with student engagement in higher education.

## Literature Review

### Gamification in Language Learning

Gamification, which involves applying game features to non-game domains (Deterding et al., 2011; Liu et al., 2021), has found tremendous success in improving motivation and engagement for learning environments. In EFL settings, learning platforms are often gamified and used to compete with each other (e.g., Kahoot or Quizizz), making it fun for studying English--(Alqahtani, 2023; Wang, 2021). A couple of recent studies have found positive results for the provision of gamified materials used in language learning, in terms of focusing students' attention and motivation and driving up their achievement (Rahman & Arifani, 2023; González-González & Mora-Carreño, 2021).

Kahoot and Quizizz in particular have been used widely due to their ease of use, quick feedback, and competitive nature (developed "in the moment"), which foster extrinsic and intrinsic motivation (Licorish et al., 2020; Korkmaz & Öz, 2021). These stimuli also stimulate eyes and ears in digital-native learners, which are congruent with the hypothesis of autonomy, competence, and relatedness of self-determination theory (Deci & Ryan, 2000; Surendeleğ et al., 2022). Studies by Ismail et al. (2022) and Daşdemir & Dönük (2021) showed that students became highly motivated to learn vocabulary, and grammar with Kahoot which increased students' participations during online teaching-learning experiences however Quizizz provided the better opportunity for self-paced and stress free learning (Khalil et al., 2023).

Yet, most of the prior studies were with English majors or students of digital literacy programs and there remains a research gap in connection to knowledge concerning how this gamification influences for non-English major students who are taking general courses (Al-Emran et al., 2022; Hursen, & Bas, 2021). As a result, the current research aims to address this gap in context and participants by investigating university students from non-English programs.

### Vocabulary Learning in EFL Contexts

The mastery of vocabulary is a key component to language proficiency which affects reading comprehension, speaking fluency and writing accuracy (Nation, 2022; Webb & Nation, 2017). However, vocabulary acquisition is far from being easy for many EFL learners given the insufficient exposure to contexts that are authentic and the use of rote memorization (Chen & Liu, 2023; Zhang, 2021). Some researchers have claimed that technology-enhanced instruction encourages more interactive and richer experiences which, in turn, leads to retention and use of vocabulary (Li, 2020; Rahimi & Karkami, 2021).

Language is indeed as anything learned in school (Berg, 2018), and gamified vocabulary learning engages repetition feedback competition—all of which are in which elements aid long-term memory retention (Hung, 2022; Ashraf et al., 2021). Specifically, programs like Kahoot and Quizizz help students' to learn vocabulary through spaced

retrieval with immediate correction, that are consistent with cognitive theories of reinforcement and active recall (Zarzycka-Piskorz, 2020; Basuki & Hidayati, 2023). Furthermore, visual information and peer competition can facilitate emotional arousal and memory encoding, retrieval processes (Bawa, 2022; González-Ramírez et al., 2021).

However, some researches show that the retention and transfer of language learnt on gamified learning settings are inconsistent (Chien, 2022; Garcia-Sanchez & Luján-García, 2023). These findings suggest that more longitudinal or quasi-experimental research is needed that focuses on both vocabulary growth in the short term and retention over time.

### **Student Retention and Engagement in Gamified Environments**

Engagement is typically described as comprising three dimensions—behavioral, emotional and cognitive (Fredricks et al., 2004), and it is a key predictor of academic performance and student retention. More importantly, gamified platforms are designed to motivate engagement in the form of interactivity feedback, competition and recognition (Wang & Tahir, 2020; Poondej & Lerdpornkulrat, 2021). In the other hand, for EFL students, engagement also involves affective mobilization to communicate, which corresponds to more positive learning motivation (Huang & Hew, 2022).

Kahoot and Quizizz promote involvement, since it includes more of social classroom dynamics rather than a scary one (Licorish et al., 2020; da Silva et al., 2022). Points, badges and leaderboards promote extrinsic motivation through instant feedback whereas satisfaction and perceived competence support intrinsic motivation (Surendeleg et al., 2022). Retention, on the other hand, is coupled with learners' continued participation and cognitive involvement in the task at hand (Mora et al., 2021). Gamified strategies may contribute to an increased retention level of content knowledge and ongoing participation in learning procedures (Baydas & Cicek, 2023; Rahman & Arifani, 2023).

Nevertheless, studies on how engagement plays a mediating role in the process of vocabulary retention related to gamified EFL learning remains relatively scarce. The few research that established the relationships between these concepts systematically in a naturalistic general English learning environment involving nonEnglish major students are what this study aims to fill.

### **Synthesis and Research Gap**

In summary, although the extant studies have demonstrated that gamification can result in a positive effect on motivation and learning results, little empirical research has examined its potential long-term impact on vocabulary retention and student engagement, particularly for non-English major university students. While there are several similar studies, many of them focus on affective reactions (fun, enjoyment) and not as much on measurable retention and engagement constructs over time (Alqahtani 2023; Chien 2022). Therefore, this research hopes to bridge the gap by exploring whether and how Kahoot and Quizizz help to boost engagement levels as well as vocabulary retention in general English based on empirical evidence.

## **METHOD**

### **Research Design**

This research used a quasi-experimental design of the pre-test–post-test non-equivalent groups to examine the effects of gamified learning via Kahoot and Quizizz on EFL university students' vocabulary engagement and retention. This design was chosen because it permits an exploration of cause-effect relationships to occur within authentic classroom settings where random assignment is frequently not feasible (Creswell & Creswell, 2023).

The experimental design can be indicated as follows:

**Table1. Quasi-Experimental Design**

Group	Pre-Test	Treatment	Post-Test
Experimental	P1	Presented through Kahoot! and Quizizz	P2
Control	P1	Presented through conventional method.	P2

Note: P1 = Pre-test activity

P2 = Post-test activity

#### Research Setting and Participants

This study was conducted in Universitas Negeri Padang, Indonesia on the academic year of 2025/2026. The population of this research were non-English-major students, consisted of 293 students. They were divided into six classes. The number of students could be seen clearly in the following table:

**Table.2 Population**

Class	N
Class A	50
Class B	50
Class C	50
Class D	46
Class E	50
Class F	47
Total	293

The six classes, with the same background knowledge and ability in English, especially in Vocabulary, were selected randomly. They were selected by writing the name of each class on six separate small piece of paper, placing them on hands, and shaking them. The first small piece paper is assigned for experimental group. The second one is assigned for control group.

#### Instrumentations

Three types of devices were used for data collection, namely a vocabulary test, engagement questionnaire and observation.

#### Writing Test

The writing was described to have required description of procedures and description of text from the nursing context (e.g., both patient care report and medical treatments). Students took the test twice — once before treatment, and once after. The rubric used to assess the compositions was a modified version of the validated one by Jacobs et al. (1981), and Weigle (2002) that evaluated grammar, vocabulary, organization, content, and mechanics. All papers were independently rated by two raters, and Cronbach's  $\alpha$  0.91 demonstrated good inter-rater reliability ensuring consistency in scoring.

#### Questionnaire

A Likert-scale self-efficacy instrument was developed comprising thirty items in three subscales: linguistic self-efficacy (feeling confident to apply grammar, vocabulary, sentence structure), task management self-efficacy (feeling well-equipped to develop and complete writing tasks efficiently) and self-regulatory self-efficacy (feeling skilled using feedback to revise or correct one's own writing). There were ten items in each subscale and all of them were scored on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The reliability was tested and the overall Cronbach's  $\alpha$  = 0.93, ranging from 0.88 to 0.91 for the subscales, indicating a high internal consistency of this scale.

#### Semi-Structured Interview

Semi-structured interviews were performed with six students purposively sampled (three from each condition) to delve into their perceptions of the feedback process, their

motivation and self-regulation. Interviews were conducted for 15–20 min each, audio recorded with permission and written verbatim transcripts produced. Thematic analysis was used to highlight recurring patterns and perspectives.

#### Procedures

The study was conducted in six instruction weeks. Both groups were provided with the same materials, topics and tasks. The procedure of the experiments is described in details as below:

**Table3. Experimental Procedure**

Phrase	Week	Activities	Experimental Group (Kahoot!! and Quizizz)	Control Group (Lecturer Feedback)
<b>Pre-Treatment</b>	Week 1	Orientation and Pre-Test	Pre-Test	Pre-Test
<b>Treatment</b>	Week 2-5	Vocabulary Instruction (4 cycles)	Kahoot and Quizizz	Conventional
<b>Post-Experiment</b>	Week 6	Post-Test and Questionnaire	1. Post-vocabulary test 2. Engagement Questionnaire 3. Observation	1. Post-vocabulary test 2. Engagement Questionnaire 3. Observation
	Week 8	Retention	Delayed post-test (retention)	Delayed post-test (retention)

Vocabulary items in the experimental condition were taught by weekly gamified quizzes. Kahoot activity where students engaged in live, instructor-led competitive gameshow quizzes with a publicly-updated scoreboard based on smartphones in class. For the Quizizz, students participated in self-pacing quizzes wherein feedback and explanations were provided immediately after every item.

In the Control Group, traditional exercises (matching words, fill in the blanks and translation) were done instead. All conditions had equivalent vocabulary targets and frequency of exposure to maintain instructional integrity.

Participants were observed for engagement and feedback was collected with respect to how the learners reacted and what kind of trouble they had during the exercises.

#### Data Analysis

Descriptive statistics were calculated by SPSS (Version 27). The statistical analyses covered: Descriptive statistics (mean, standard deviation) for all the variables. ANOVA one-way was used to investigate group differences in vocabulary gain and engagement. For within group, pre-test/post-test t-tests were conducted. Retention performance was analyzed by repeated-measures ANOVA with pre-, post- and delayed post-tests as factors. Pearson correlation used to determine the relationship between engagement and retention.

The magnitude of treatment effects was analyzed based on effect sizes (ES), as estimated by Cohen's  $d$  and  $\eta^2$  (Cohen, 1988). Notes of qualitative observations were thematically analyzed in order to triangulate the quantitative findings and unearthing nuances surrounding behavioral and emotional engagement modalities during gamified learning experiences.

## RESULTS AND DISCUSSION

### Results

#### Descriptive Statistics of Vocabulary Achievement

Table 4 presents the descriptive statistics of vocabulary scores for both the experimental and control groups across three testing phases: pre-test, post-test, and delayed post-test.

**Table4. Descriptive Statistics of Vocabulary Test Scores**

Group	Test Phase	N	Mean	SD
Experimental (Kahoot & Quizizz)	Pre-test	146	56.42	8.31
	Post-test	146	78.65	7.94
	Delayed Post-test	146	73.28	8.12
Control (Conventional)	Pre-test	147	55.87	8.46
	Post-test	147	69.14	8.21
	Delayed Post-test	147	62.03	8.75

As shown in Table 4, both groups demonstrated comparable vocabulary knowledge at the pre-test stage, indicating homogeneity of initial proficiency. However, the experimental group showed a substantially higher increase from pre-test to post-test compared to the control group. Although a decline in scores was observed in the delayed post-test for both groups, the experimental group maintained significantly higher retention levels.

#### Inferential Analysis of Vocabulary Gains

An independent samples t-test was conducted to examine differences in post-test scores between groups.

**Table5. Independent Samples t-Test for Post-Test Vocabulary Scores**

Group	Mean	SD	t	df	p	Cohen's d
Experimental	78.65	7.94	8.37	291	< .001	0.97
Control	69.14	8.21				

The results indicate a statistically significant difference favoring the experimental group ( $p < .001$ ), with a large effect size (Cohen's  $d = 0.97$ ), suggesting a strong impact of gamified vocabulary learning on immediate vocabulary acquisition.

#### Vocabulary Retention over Time

To analyze vocabulary retention, a repeated-measures ANOVA was conducted using pre-test, post-test, and delayed post-test scores.

**Table6. Repeated-Measures ANOVA for Vocabulary Retention**

Source	df	F	p	Partial $\eta^2$
Time	2	312.45	< .001	0.68
Group	1	74.29	< .001	0.20
Time $\times$ Group	2	41.73	< .001	0.22

The significant Time  $\times$  Group interaction effect ( $p < .001$ ) indicates that vocabulary development and retention patterns differed significantly between groups. The experimental group demonstrated superior retention over time, confirming that gamified learning supported more durable vocabulary learning than conventional instruction.

### Student Engagement Results

Student engagement data were analyzed using descriptive statistics and one-way ANOVA.

**Table7. Descriptive Statistics of Engagement Scores**

Engagement Dimension	Group	Mean	SD
Behavioral Engagement	Experimental	4.31	0.46
	Control	3.52	0.51
Emotional Engagement	Experimental	4.44	0.42
	Control	3.61	0.49
Cognitive Engagement	Experimental	4.12	0.48
	Control	3.68	0.50

One-way ANOVA revealed statistically significant differences across all engagement dimensions ( $p < .001$ ), favoring the experimental group.

### Relationship between Engagement and Retention

Pearson correlation analysis was conducted to explore the relationship between engagement and delayed post-test scores.

**Table8. Correlation between Engagement and Vocabulary Retention**

Variable	r	p
Total Engagement – Delayed Post-test	0.62	< .001

The strong positive correlation indicates that higher engagement was associated with better long-term vocabulary retention.

### Discussion

The present study demonstrates that gamified vocabulary learning through Kahoot and Quizizz significantly enhances EFL university students' engagement and vocabulary retention compared to conventional instruction. These findings can be meaningfully interpreted through several established theoretical frameworks, particularly Self-Determination Theory (SDT), Cognitive Theory of Multimedia Learning, and Retrieval Practice Theory, which together explain why gamification leads to more effective and durable vocabulary learning.

From the perspective of Self-Determination Theory (Deci & Ryan, 2000; Ryan & Deci, 2020), the higher engagement levels observed in the experimental group indicate that gamified platforms successfully satisfied learners' basic psychological needs for autonomy, competence, and relatedness. Kahoot fostered relatedness and competence through real-time competition, public leaderboards, and instant feedback, allowing students to compare their performance with peers and experience immediate achievement. Quizizz, on the other hand, supported autonomy by enabling self-paced learning and individualized feedback, reducing performance anxiety and allowing learners to regulate their own learning process. The statistically significant differences in behavioral and emotional engagement between groups suggest that when these psychological needs are met, students are more willing to invest effort and attention in vocabulary learning activities.

The findings also align with Fredricks et al.'s (2004) multidimensional engagement framework, which conceptualizes engagement as behavioral, emotional, and cognitive. The experimental group's superior performance across all three dimensions confirms that gamification does not merely entertain learners but promotes meaningful learning engagement. Behavioral engagement was reflected in active participation and sustained on-task behavior during gamified sessions. Emotional engagement was evident in students' enjoyment, excitement, and reduced anxiety, as reported in both questionnaire and interview data. Cognitive engagement, which is crucial for retention, was facilitated through immediate feedback and repeated exposure to vocabulary items, particularly in Quizizz. This tri-

dimensional engagement explains the strong positive correlation found between engagement and delayed post-test scores, supporting the argument that engagement functions as a key mediator between instructional design and learning outcomes.

In terms of cognitive processing, the superior vocabulary retention demonstrated by the experimental group can be explained through Retrieval Practice Theory and Cognitive Load Theory. Gamified quizzes required students to actively retrieve vocabulary items rather than passively recognize them, which strengthens memory traces and enhances long-term retention. Immediate feedback further reinforced correct responses and corrected misconceptions, promoting deeper encoding. Unlike traditional exercises that often rely on rote memorization, Kahoot and Quizizz provided repeated, varied, and time-bound retrieval opportunities, which are known to enhance durable learning. Importantly, the self-paced nature of Quizizz helped manage cognitive load by allowing learners to process feedback at their own speed, thereby preventing overload and supporting sustained cognitive engagement.

Additionally, the findings resonate with the Cognitive Theory of Multimedia Learning, which posits that learning is more effective when verbal information is integrated with visual and interactive elements. The multimodal presentation of vocabulary items, combined with interactive response systems, likely enhanced learners' attention and memory encoding. Emotional arousal triggered by competition and game elements may have further strengthened memory consolidation, explaining why the experimental group showed significantly higher retention in the delayed post-test despite a natural decline over time.

Crucially, this study extends theoretical applications of gamification to non-English-major university students, a group often characterized by lower intrinsic motivation toward English learning. Within an instrumental motivation context, gamified learning appears to function as a motivational bridge by transforming vocabulary learning into an engaging, goal-oriented activity. This supports SDT's claim that instructional environments can foster internalized motivation even when learners initially perceive tasks as externally imposed. The results thus challenge the assumption that gamification only produces short-term motivational effects and provide empirical evidence that, when grounded in sound pedagogical design, gamification can support sustained learning outcomes.

Nevertheless, the findings also suggest that gamification should not be viewed as a standalone solution. The effectiveness of Kahoot and Quizizz depended on their alignment with learning objectives, balanced competition, and structured feedback. Excessive focus on speed or ranking may risk superficial processing or anxiety for some learners, echoing concerns raised in prior literature. Therefore, theoretical integration and instructional intentionality are essential for maximizing the pedagogical value of gamified learning environments.

In summary, by integrating Self-Determination Theory, engagement theory, and cognitive learning theories, this study provides a theoretically grounded explanation for why gamified vocabulary learning enhances both engagement and retention. The findings reinforce the view that effective gamification is not merely about adding game elements but about designing learning environments that support psychological needs, cognitive processing, and meaningful learner engagement.

## CONCLUSION

This study provides empirical evidence that gamified vocabulary learning using Kahoot and Quizizz positively affects EFL university students' engagement and vocabulary retention. Compared to conventional instruction, gamified learning not only resulted in higher immediate vocabulary gains but also led to more sustained retention over time. The significant correlation between engagement and retention highlights the crucial role of active

learner involvement in successful vocabulary acquisition.

Pedagogically, the findings suggest that EFL instructors, particularly in higher education contexts involving non-English-major students, should consider integrating gamified platforms into vocabulary instruction. Combining competitive and self-paced gamification strategies may optimize both motivation and cognitive processing. However, teachers should design gamified activities carefully to ensure alignment with learning objectives and avoid excessive competition that may overwhelm some learners.

Despite its contributions, this study is limited by its quasi-experimental design and single institutional context. Future research may adopt longitudinal designs, involve diverse educational settings, or explore how individual learner differences mediate the effects of gamified vocabulary learning. Nevertheless, the present study contributes to the growing body of research supporting gamification as an effective tool for enhancing engagement and long-term vocabulary learning in EFL contexts.

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