

THE EFFECT OF KAHOOT! BASED VOCABULARY LEARNING TOOL ON VOCABULARY MASTERY AND MOTIVATION

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Abstract: Vocabulary mastery is central to EFL learning, yet conventional instruction is often perceived as repetitive and demotivating. Gamified platforms such as Kahoot! have therefore gained increasing attention as an alternative instructional tool. However, few studies have simultaneously examined its effects on both vocabulary mastery and learning motivation, particularly within Islamic senior high schools. This study aimed to investigate the effect of Kahoot! based instruction on eleventh-grade students' vocabulary mastery and learning motivation, encompassing both intrinsic and extrinsic dimensions, as conceptualized in Self-Determination Theory, relative to conventional instruction. A quasi-experimental design with a non-equivalent control group was employed, involving 60 eleventh-grade students at an Islamic senior high school, divided equally into experimental and control groups ($n = 30$ each). Data were collected through a 50-item vocabulary test and a 35-item motivation questionnaire, then analyzed using the Mann-Whitney U Test. Results revealed no statistically significant differences between groups in vocabulary mastery ($p = .297$) or extrinsic motivation ($p = .636$). However, a significant difference emerged in intrinsic motivation ($p = .004$), with the control group scoring higher than the experimental group. This finding suggests that Kahoot!'s competitive features, particularly its countdown timer and public leaderboard, may have prompted students toward rapid guessing over deep cognitive processing while inducing performance pressure that undermined their sense of autonomy and competence. These results indicate that instructional design quality and meaningful learning activities exert greater influence on learning outcomes than the choice of instructional media alone, positioning Kahoot! as a supplementary rather than primary vocabulary-teaching tool.

Keywords: Kahoot!, vocabulary mastery, learning motivation, self-determination theory, EFL, gamification

INTRODUCTION

Vocabulary mastery is one of the most important foundations of successful English as a Foreign Language (EFL) learning because it enables learners to communicate effectively in both spoken and written forms. Studies by Alek et al. (2023) and Holifah and Kurniasih (2021) highlight that vocabulary knowledge supports all language skills, including listening, speaking, reading, and writing. Without sufficient vocabulary, students often struggle to understand information and express their ideas clearly. However, despite its importance, many EFL learners perceive vocabulary learning as boring and uninteresting. This is mainly because traditional teaching methods often depend on memorizing word lists and repetitive practice (Zhou et al., 2025). According to Nation (2001), vocabulary instruction that focuses primarily on mechanical memorization is unlikely to help students retain new words for long periods or use them confidently in real communication. As a result, the contrast between the essential role of vocabulary and the limited effectiveness of conventional teaching remains a major challenge in EFL classrooms and provides the main rationale for this study.

To overcome this challenge, many educators have begun integrating gamification into language learning because of its potential to create more engaging and motivating classroom

experiences (Smirani & Yamani, 2024). Gamification refers to the use of game-like features, such as points, badges, leaderboards, and instant feedback, in educational activities that are not originally designed as games (Deterding et al., 2011; Ratinho & Martins, 2023). In language education, these features have been shown to increase students' participation, enjoyment, and overall learning experience (Rivera & Garden, 2021). One of the most widely used gamified platforms is Kahoot!, which allows teachers to create interactive quizzes that students can complete using their own devices. Through immediate feedback and a competitive classroom environment, Kahoot! encourages students to participate more actively during lessons. Previous studies have reported positive outcomes from its use. For example, Holbrey (2020) found that students considered vocabulary learning with Kahoot! easier and more enjoyable than conventional instruction, while España-Delgado (2023) reported that the platform significantly increased students' learning motivation.

The present study is grounded in Self-Determination Theory (SDT) proposed by Ryan and Deci (2018), which explains that students are more likely to develop intrinsic motivation when three basic psychological needs are fulfilled: autonomy, competence, and relatedness. Within this framework, Kahoot! is considered a promising learning tool because several of its features align with these psychological needs. The platform provides immediate feedback that can strengthen students' sense of competence, allows learners to make their own responses during quizzes, which supports autonomy, and creates interactive classroom activities that encourage communication and collaboration among peers, thereby fostering relatedness (Pratiwi & Waluyo, 2023). Because of these characteristics, many researchers have suggested that Kahoot! can improve not only students' academic achievement but also their motivation to learn. Recent studies support this view. For example, Farhane (2025) found that Kahoot! improved vocabulary retention among Moroccan secondary school students, while Bela Marinda et al. (2025) reported similar positive results in Indonesia. Likewise, Devitriana and Wijirahayu (2025) showed that the interactive nature of Kahoot! enhanced students' motivation and self-confidence, whereas studies by Putri et al. (2025) and Harahap et al. (2025) revealed that the platform increased learners' engagement and enthusiasm during classroom activities.

Despite these encouraging findings, the effectiveness of Kahoot! should not be viewed without considering its possible limitations. Wang and Tahir (2020), in their comprehensive review, pointed out that features such as countdown timers and public leaderboards may create pressure for some students. Rather than encouraging meaningful learning, these competitive elements can lead learners to focus on answering quickly, rely on guessing, or experience anxiety during classroom activities. Such conditions are consistent with Krashen's (1982) Affective Filter Hypothesis, which suggests that high levels of anxiety can interfere with language acquisition by preventing learners from processing language effectively. Consequently, in certain situations, a conventional classroom with a more relaxed learning atmosphere may support learning more effectively than a highly competitive gamified environment. Although these concerns have been acknowledged in previous studies, they have received far less attention than the reported benefits of gamification, especially when examined through the perspective of Self-Determination Theory.

Although research on Kahoot! has grown considerably in recent years, several important gaps remain. Most previous studies have focused on elementary schools, junior high schools, or higher education, while relatively little attention has been given to senior high school students in Indonesia. Research conducted in Islamic senior high schools (Madrasah Aliyah) is even more limited, despite the possibility that differences in educational context, curriculum, and student characteristics may influence the effectiveness of instructional approaches. Furthermore, existing studies have often examined either vocabulary mastery or learning motivation separately. Only a few have investigated both outcomes simultaneously,

particularly by distinguishing between intrinsic and extrinsic motivation, even though Self-Determination Theory suggests that these aspects are closely related in the learning process.

To address these gaps, this study was conducted at MAN Kota Batu to examine whether Kahoot! based instruction leads to better learning outcomes than conventional teaching methods. Specifically, the study sought to answer two research questions:

1. Do students who learn vocabulary through Kahoot! achieve higher vocabulary mastery than those taught through conventional instruction?
2. Do students who use Kahoot! demonstrate higher learning motivation, including both intrinsic and extrinsic motivation, than students who receive conventional instruction?

METHOD

This study employed a quasi-experimental design with a non-equivalent control group to investigate the effect of Kahoot!-based instruction on students' vocabulary mastery and learning motivation. Following Creswell (2012), this design was selected because random assignment of individual participants was not feasible while a comparison between treatment and control groups was still required. The participants were 60 eleventh-grade students at MAN Kota Batu, East Java, Indonesia, selected through cluster sampling from a population of 180 students. Two intact classes were assigned as the experimental group ($n = 30$) and the control group ($n = 30$). Data were collected using a researcher-developed vocabulary test based on Nation's (2001) framework of vocabulary knowledge and a 35-item motivation questionnaire adapted from the Language Learning Orientations Scale (Noels et al., 2000) to measure students' intrinsic and extrinsic motivation. Both instruments were validated by experts, and reliability testing showed acceptable levels of internal consistency.

Data were collected over six meetings for both groups. At Meeting 1, students completed the vocabulary pretest, followed by four treatment sessions (Meetings 2–5) in which both groups studied the same Procedure Text materials, including generic structure, ingredient- and tool-related nouns, imperative verbs, and sequence expressions. The experimental group learned through weekly Kahoot! quizzes featuring countdown timers, point accumulation, and public leaderboards, whereas the control group received conventional instruction through textbook-based exercises and teacher-led question-and-answer activities. At Meeting 6, students completed the vocabulary posttest and the learning motivation questionnaire, which was administered only after the treatment to avoid sensitizing students to competition- and reward-related items before the intervention, following Fraenkel et al. (2012). Data were analyzed using SPSS 26.0. Descriptive statistics were first calculated, with vocabulary scores classified according to Rosanti's (2018) five-level criterion and motivation scores based on Oxford's (1990) three-level criterion. The Shapiro-Wilk test indicated that several variables were not normally distributed, including the experimental group's posttest vocabulary scores ($p = .018$) and the control group's intrinsic ($p = .002$) and extrinsic motivation scores ($p = .006$). Meanwhile, Levene's test confirmed homogeneous variance for both the pretest ($p = .056$) and posttest ($p = .064$) vocabulary scores. As the assumption of normality was not fully satisfied, the Mann-Whitney U Test was employed to compare posttest vocabulary mastery and both intrinsic and extrinsic motivation between the experimental and control groups at a significance level of $\alpha = .05$.

FINDINGS

1. Vocabulary Mastery

Descriptive statistics indicated that both groups entered the study with comparable vocabulary knowledge, as shown in Table 1.

Table 1. Descriptive Statistics of Vocabulary Test Scores

Group	Pretest	Posttest	SD (Pretest)	SD (Posttest)
Experimental	73.80	87.27	11.415	5.930
Control	73.57	84.60	8.795	7.811

The pretest results showed that the experimental group ($M = 73.80$) and the control group ($M = 73.57$) had nearly identical mean scores, with both groups classified in the “Good” category according to Rosanti’s (2018) criteria. After the treatment, the mean score of the experimental group increased to 87.27, while the control group achieved a mean score of 84.60. Although the experimental group obtained a slightly higher posttest mean, a Mann-Whitney U Test was conducted to determine whether the difference between the two groups was statistically significant. The results of the analysis are presented in Table 2.

Table 2. Mann-Whitney U Test Results for Posttest Vocabulary Scores

Group	N	Mean Rank	Mann-Whitney U	p (2-tailed)
Experimental	30	32.83	380.000	.297
Control	30	28.17		

As presented in Table 2, the experimental group obtained a higher mean rank (32.83) than the control group (28.17). However, the Mann-Whitney U Test indicated that this difference was not statistically significant ($p = .297$). Since the p-value exceeded the .05 significance level, the null hypothesis was retained. These findings indicate that Kahoot! based instruction did not result in significantly higher vocabulary mastery than conventional instruction.

2. Learning Motivation

Descriptive statistics for the two motivational dimensions are presented in Table 3.

Table 3. Descriptive Statistics for Intrinsic and Extrinsic Motivation

Dimension	Group	Mean	Interpretation
Intrinsic	Experimental	1.88	Low
	Control	2.24	Low
Extrinsic	Experimental	2.60	Moderate
	Control	2.68	Moderate

Based on Oxford’s (1990) classification, both groups were categorized as having low intrinsic motivation and moderate extrinsic motivation, although the control group achieved higher mean scores on both dimensions. To determine whether these differences were statistically significant, Mann-Whitney U Tests were performed. The results are presented in Table 4.

Table 4. Mann-Whitney U Test Results for Intrinsic and Extrinsic Motivation

Dimension	Group	N	Mean Rank	U	p
Intrinsic	Experimental	30	23.93	253.000	.004
	Control	30	37.07		
Extrinsic	Experimental	30	29.43	418.000	.636
	Control	30	31.57		

The Mann-Whitney U Test revealed a statistically significant difference in intrinsic motivation between the two groups ($p = .004 < .05$). The control group obtained a higher mean rank (37.07) than the experimental group (23.93), indicating that students who received conventional instruction reported significantly higher intrinsic motivation than those who learned through Kahoot!. Therefore, the null hypothesis for intrinsic motivation was rejected. In contrast, no significant difference was found in extrinsic motivation ($p = .636 > .05$). The experimental group (mean rank = 29.43) and the control group (mean rank = 31.57) showed comparable levels of extrinsic motivation, leading to the retention of the null hypothesis for this dimension. Overall, these findings suggest that Kahoot!-based instruction did not produce significantly better outcomes in vocabulary mastery or learning motivation than conventional instruction. Notably, the control group demonstrated significantly higher intrinsic motivation than the experimental group.

DISCUSSION

1. The Effect of Kahoot! on Vocabulary Mastery

The findings showed that Kahoot!-based instruction did not produce significantly higher vocabulary mastery than conventional instruction ($p = .297$). This result supports Nation's (2001) view that vocabulary acquisition is influenced more by the quality of learners' exposure to new words and opportunities for repeated, meaningful practice than by the instructional medium itself. In this study, both groups learned the same vocabulary content over the same number of instructional sessions and were given comparable opportunities to practice. The only difference was the learning medium. Therefore, the absence of a significant difference suggests that well-designed instruction and sufficient vocabulary practice play a greater role in vocabulary development than whether the activities are delivered through Kahoot! or conventional classroom methods. This interpretation is also consistent with Paivio's (1990) Dual Coding Theory. Although Kahoot! presented vocabulary using colorful visuals and interactive quizzes, the control group also received visual support through illustrated worksheets and contextual Procedure Text materials, allowing both groups to benefit from verbal and visual representations of vocabulary.

The present findings differ from those of Farhane (2025) and Bela Marinda et al. (2025), who reported that Kahoot! significantly improved students' vocabulary mastery. However, this difference does not necessarily contradict previous research. Instead, it suggests that the effectiveness of Kahoot! may depend on factors such as learners' characteristics, treatment duration, and instructional context. Similarly, although Putri et al. (2025) and Harahap et al. (2025) found that Kahoot! increased students' engagement and enthusiasm, higher classroom engagement does not automatically result in better vocabulary retention. The findings of the present study indicate that students may enjoy participating in Kahoot! activities without necessarily achieving significantly greater vocabulary gains than those taught through conventional instruction.

Several factors may explain the absence of a significant effect. First, the six-meeting treatment period may not have provided sufficient time for the benefits of Kahoot! to produce measurable improvements in vocabulary mastery. Second, students' positive responses to Kahoot! may have reflected a novelty effect, as many were using the platform for the first time (Wang, 2015). Finally, the competitive features of Kahoot!, particularly the countdown timer, may have encouraged students to answer quickly rather than carefully process the meaning of unfamiliar words. As noted by Wang and Tahir (2020), this time pressure can reduce opportunities for deeper semantic processing, which is essential for long-term vocabulary retention. Consequently, while Kahoot! successfully created an engaging classroom atmosphere, its motivational features alone were not sufficient to produce significantly better vocabulary learning outcomes than conventional instruction.

2. The Effect of Kahoot! on Learning Motivation.

One of the most notable findings of this study was that the control group demonstrated significantly higher intrinsic motivation than the experimental group ($p = .004$). This result contrasts with the expectations of Self-Determination Theory (Deci & Ryan, 2000; Ryan & Deci, 2018), which proposes that learning environments supporting autonomy, competence, and relatedness should foster intrinsic motivation. Although Kahoot! provides features such as independent responses, immediate feedback, and interactive classroom participation, these features may not have satisfied students' psychological needs as expected. Instead, the findings suggest that Kahoot!'s competitive elements, particularly the countdown timer and public leaderboard, may have reduced students' sense of autonomy and competence. This interpretation is consistent with Wang and Tahir (2020), who argued that these features can create performance pressure, especially for students with lower confidence or slower processing speed. It is also supported by Krashen's (1982) Affective Filter Hypothesis, which explains that higher levels of anxiety may hinder language learning and reduce students' willingness to engage meaningfully with learning activities. In contrast, the conventional classroom provided a more relaxed learning environment that allowed students to participate at their own pace, which may have contributed to their higher intrinsic motivation.

In contrast to the findings for intrinsic motivation, no significant difference was found in extrinsic motivation between the two groups ($p = .636$), with both groups demonstrating moderate levels of extrinsic motivation. This finding can be explained using Keller's (1987) ARCS Model, particularly the relevance and satisfaction components. Regardless of the instructional method, students remained motivated by similar external factors, such as academic grades, examinations, and teachers' expectations. These findings suggest that while Kahoot! did not significantly influence students' external motivation, its competitive features had a greater impact on the more psychologically sensitive dimension of intrinsic motivation.

The present findings differ from those reported by Devitriana and Wijirahayu (2025) and España-Delgado (2023), who found that Kahoot! enhanced students' learning motivation. Rather than contradicting these studies, the differences suggest that the effectiveness of Kahoot! is influenced by contextual and learner-related factors. Students in an Islamic senior high school may respond differently to public competition and time-limited activities than learners in other educational settings. Therefore, the motivational impact of gamified learning should not be viewed as universal but rather as dependent on how well the instructional design aligns with students' psychological needs, classroom characteristics, and learning context.

CONCLUSION

This study examined the effect of Kahoot!-based instruction on vocabulary mastery and learning motivation among eleventh-grade EFL students at an Islamic senior high school. The findings showed that although both the experimental and control groups improved their vocabulary mastery after the treatment, there was no statistically significant difference between the two groups ($p = .297$). Similarly, no significant difference was found in extrinsic motivation ($p = .636$). However, the control group demonstrated significantly higher intrinsic motivation than the experimental group ($p = .004$). These results indicate that Kahoot! did not produce significantly better outcomes than conventional instruction in either vocabulary mastery or overall learning motivation.

The findings also suggest that the effectiveness of gamified learning depends not only on the technology itself but also on how it is implemented. Consistent with Self-Determination Theory, instructional strategies are more likely to enhance intrinsic motivation when they support students' autonomy, competence, and relatedness. In the present study, Kahoot!'s competitive features, particularly the countdown timer and public leaderboard, may have created pressure that reduced students' intrinsic motivation. Therefore, Kahoot! should be

viewed as a complementary instructional tool that can increase classroom engagement and provide variety in learning activities, rather than as a replacement for well-planned conventional instruction.

This study has several limitations. The treatment lasted only six meetings, which may not have been sufficient to capture the long-term effects of Kahoot! on vocabulary learning. In addition, learning motivation was measured only at the end of the intervention using a self-report questionnaire, making it impossible to examine changes in motivation over time. Future studies are therefore recommended to extend the treatment period, administer motivation questionnaires at both the pretest and posttest stages, and adopt mixed-methods approaches to gain a deeper understanding of students' learning experiences and the factors influencing the effectiveness of Kahoot! in different educational contexts.

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