

## GAMIFIED VOCABULARY LEARNING WITH KAHOOT IN EFL CLASSROOMS

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### ABSTRACT

This study examined differences in receptive English vocabulary achievement between students receiving Kahoot-supported instruction and those receiving conventional instruction. A quantitative quasi-experimental design involved 60 students in intact instructional groups, with 30 students per condition. Vocabulary performance was assessed before and after instruction using a 20-item multiple-choice test measuring word meanings and appropriate vocabulary in context. Reported post-test scores favored the Kahoot group ( $M = 83.30$ ,  $SD = 4.80$ ) over the conventional group ( $M = 74.00$ ,  $SD = 5.80$ ). An independent-samples t-test reconstructed from the reported summary statistics yielded  $t(58) = 6.77$ ,  $p < .001$ , assuming independent observations and equal variances. The estimated mean difference was 9.30 points, with a 95% confidence interval of [6.55, 12.05] and Cohen's  $d = 1.75$ . These estimates indicate higher post-instruction receptive vocabulary performance in the Kahoot group. However, unresolved statistical inconsistencies require verification against the original data. Non-randomized grouping and the absence of adjustments for baseline achievement and classroom clustering further limit causal interpretation. The findings provide a preliminary basis for evaluating Kahoot as a supplementary vocabulary practice tool. Future studies should incorporate multiple classrooms, baseline adjustment, delayed testing, and productive vocabulary measures to establish the durability and broader relevance of any learning benefits.

**Keyword:** Kahoot; gamified learning; receptive vocabulary achievement; English as a foreign language.

### I. INTRODUCTION

Vocabulary is a fundamental component of language learning because it provides the basic resources that learners need to understand and produce meaningful language. Without sufficient vocabulary knowledge, learners may experience difficulties in understanding spoken and written texts, expressing ideas, and participating effectively in communication. Nation (2022) emphasizes that vocabulary knowledge is an essential part of language proficiency and that vocabulary learning requires systematic attention, repeated exposure, and opportunities for meaningful use. Vocabulary acquisition is therefore not simply a process of memorizing individual words, but involves developing knowledge of word form, meaning, and use. For English as a Foreign Language (EFL) learners, developing an adequate vocabulary is particularly important because classroom instruction may provide only limited opportunities for exposure to English (Aziz,

2023). Vocabulary acquisition can be understood as a gradual process through which learners develop knowledge of new words and are increasingly able to recognize, understand, recall, and use them appropriately. Nation (2022) explains that knowing a word involves several dimensions, including its spoken and written form, meaning, grammatical behaviour, collocations, and appropriate use. Consequently, vocabulary instruction needs to provide learners with repeated encounters with vocabulary items and opportunities to retrieve and apply what they have learned. Webb (2020) similarly highlights the importance of repetition and retrieval in vocabulary learning because repeated encounters with words can strengthen learners' knowledge and retention. These theoretical perspectives suggest that effective vocabulary instruction should provide not only exposure to new vocabulary but also opportunities for active practice and retrieval. Despite the importance of vocabulary, learning new words can be challenging for EFL students. Learners may have difficulty remembering unfamiliar words, distinguishing similar meanings, pronouncing new vocabulary, and using words appropriately in context. Traditional vocabulary instruction may sometimes emphasize translation, memorization, and written exercises (Aziz & Rohmah, 2022). Although these approaches can provide useful vocabulary practice, they may not always encourage active participation and sustained engagement. Therefore, teachers need to consider instructional strategies that can provide repeated vocabulary practice while creating an environment in which students are motivated to participate actively. The development of educational technology has provided opportunities for teachers to introduce more interactive approaches to language learning. One approach that has received considerable attention is gamification. Gamification refers to the incorporation of game elements and game-design principles into non-game contexts, including education. Game elements such as points, competition, challenges, feedback, levels, and rewards can be incorporated into learning activities to increase students' participation and engagement. Zainuddin et al. (2020), through a systematic review of empirical studies, reported that gamification has been associated with several positive themes in education, including student engagement, motivation, academic achievement, and social interaction. Similarly, a systematic review by García et al. (2021) found that educational gamification has potential benefits for students' academic performance, commitment, and motivation.

The theoretical basis of gamification can also be connected to several learning theories. Krath et al. (2021) reviewed the theoretical foundations of gamification, serious games, and game-based learning and identified a wide range of theories used to explain how game-based approaches may influence learning. Among the frequently discussed theoretical perspectives are Self-Determination Theory, flow theory, experiential learning theory, and constructivist learning theory. In particular, game-based learning can provide learners with immediate feedback, manageable learning tasks, clear goals, and opportunities to experience progress. These characteristics may help explain why gamified activities can encourage learners to become more actively involved in the learning process. One digital

platform that incorporates several gamification elements into classroom activities is Kahoot. Kahoot is an interactive game-based learning platform that allows teachers to create quizzes and formative assessment activities. Students can participate using digital devices and receive immediate feedback after responding to questions. The platform also incorporates game elements such as points, rankings, time limits, and competition. These features can transform conventional quiz activities into more interactive classroom experiences. In vocabulary instruction, Kahoot can be used to present new vocabulary, review previously learned words, test students' understanding of word meanings, and provide repeated retrieval opportunities. The use of Kahoot is particularly relevant to vocabulary learning because vocabulary acquisition requires repeated exposure and retrieval. When students respond to vocabulary questions, they are required to retrieve information from memory rather than simply recognize vocabulary presented by the teacher. Immediate feedback can then help students identify incorrect answers and reinforce correct knowledge. In addition, the competitive and interactive characteristics of Kahoot may create a more engaging learning environment. From a theoretical perspective, this combination of retrieval practice, immediate feedback, repetition, and engagement provides a potential mechanism through which Kahoot may support vocabulary acquisition.

Previous empirical studies have provided evidence regarding the potential effectiveness of Kahoot for vocabulary learning. Ahmed et al. (2022), for example, investigated the effects of Kahoot as a game-based learning tool on vocabulary recall and retention among Iranian EFL learners. Their study involved an experimental group and a control group, with the experimental group receiving vocabulary instruction through Kahoot. The researchers found significant differences between the groups in immediate and delayed vocabulary post-tests, with the experimental group demonstrating more favourable results. These findings suggest that Kahoot may support not only immediate vocabulary learning but also longer-term retention. Similarly, Katemba et al. (2022) investigated the use of Kahoot for vocabulary learning among 68 seventh-grade students. Using pre-test and post-test measures, the study examined vocabulary enhancement through Kahoot-based activities and reported significant differences in vocabulary improvement. Another study comparing digital-game-based and paper-based vocabulary learning among EFL undergraduate students used Kahoot for the digital-game-based group and paper-based quizzes for the comparison group. The study illustrates how Kahoot can be incorporated into vocabulary review and assessment activities while providing immediate feedback to learners. Research conducted in the Indonesian EFL context has also examined the relationship between Kahoot and vocabulary learning. Rojabi et al. (2022) investigated Kahoot as a tool for gamifying vocabulary learning and examined outcomes related to examination scores, engagement, and motivation. Their research is particularly relevant because it was conducted in Indonesia and considered the use of Kahoot in vocabulary-related learning activities. More recent Indonesian research has likewise examined Kahoot as a learning medium

for vocabulary mastery and reported differences between pre-test and post-test scores following Kahoot-based instruction. These studies indicate that Kahoot has become a relevant digital learning tool in English language classrooms, although its effectiveness can still vary according to learner characteristics, instructional context, research design, and learning objectives. Although previous studies have demonstrated positive associations between Kahoot and vocabulary learning, further research is still necessary. Existing studies have examined different educational levels, sample sizes, instructional conditions, and outcome measures. Some studies focus on students' perceptions, motivation, or engagement, whereas others investigate vocabulary recall, retention, or achievement. For example, research on students' perceptions suggests that features such as timers, scores, and leaderboards can increase students' interest, motivation, and focus, although individual learning preferences may influence how useful students perceive the platform to be. Therefore, examining vocabulary acquisition through a controlled comparison between an experimental group and a control group can provide additional empirical evidence concerning the effectiveness of Kahoot. The present study addresses this need by examining the effect of Kahoot on students' English vocabulary acquisition using a quasi-experimental design. The study involves 60 students, consisting of 30 students in an experimental group and 30 students in a control group. The experimental group receives vocabulary instruction supported by Kahoot, while the control group receives conventional vocabulary instruction. Pre-test and post-test vocabulary scores are used to examine students' learning outcomes and determine whether the use of Kahoot results in a significant difference in vocabulary acquisition between the two groups.

The purpose of this study is therefore to determine whether Kahoot has a significant effect on students' English vocabulary acquisition compared with conventional instruction. The study is guided by the assumption that the combination of game elements, repeated vocabulary practice, immediate feedback, and active participation may provide favourable conditions for vocabulary learning. The findings are expected to contribute to the existing literature on technology-enhanced language learning and provide practical information for English teachers who are considering the integration of gamification into vocabulary instruction. More specifically, this study seeks to answer the following research question: Is there a significant difference in English vocabulary acquisition between students who are taught using Kahoot and students who are taught using conventional instruction? Based on the theoretical perspectives and findings of previous studies, the hypothesis of this study is formulated as follows: students who receive English vocabulary instruction through Kahoot achieve significantly different vocabulary acquisition outcomes from students who receive conventional vocabulary instruction.

## **II. REVIEW OF LITERATURE**

### ***Vocabulary Acquisition in English Language Learning***

Vocabulary is a central component of language proficiency because learners need adequate knowledge of words to comprehend and produce meaningful communication. Vocabulary knowledge involves more than knowing the basic meaning of a word. It includes knowledge of a word's form, meaning, grammatical behaviour, collocations, and appropriate use in different contexts. Nation (2022) explains that vocabulary learning is a gradual process in which learners develop both receptive and productive knowledge of words. Receptive vocabulary refers to the ability to recognize and understand words when they are encountered in listening or reading, whereas productive vocabulary involves the ability to recall and use words appropriately in speaking and writing. Vocabulary acquisition is particularly important in English as a Foreign Language (EFL) context. Learners who have insufficient vocabulary may experience difficulties understanding texts, following classroom instruction, expressing ideas, and communicating with other speakers. Webb (2020) argues that repeated encounters with vocabulary items are important because vocabulary knowledge develops gradually through exposure and use. Therefore, vocabulary instruction should provide learners with sufficient opportunities to encounter, retrieve, and use new words. One important factor in vocabulary acquisition is repetition. Learners generally need to encounter a word several times before they develop strong knowledge of its form and meaning. Repetition can be particularly effective when it is accompanied by active retrieval. Rather than merely seeing a vocabulary item repeatedly, learners benefit from being required to recall its meaning or form. In this context, classroom activities that combine repetition, retrieval, feedback, and meaningful practice can potentially facilitate vocabulary acquisition. Another important aspect is learner engagement. Vocabulary learning can become difficult when students perceive activities as repetitive or uninteresting. Interactive learning activities may provide opportunities for students to participate more actively. Consequently, teachers have increasingly explored technology-supported approaches that can make vocabulary learning more interactive while maintaining the instructional objectives of the lesson.

### ***Technology-Enhanced Language Learning***

The integration of technology into language education has changed the way teachers design and deliver learning activities. Digital technologies can provide learners with access to multimedia materials, interactive exercises, immediate feedback, and flexible learning environments. In language learning, technology can support learners in practicing vocabulary, grammar, pronunciation, reading, listening, and other language skills. Technology-enhanced language learning can also promote learner-centred instruction. Instead of receiving information passively, students can interact with learning materials and receive feedback about their performance. This is particularly relevant to vocabulary learning because learners can use digital tools to repeatedly practice vocabulary items and

receive immediate information about their responses. The effectiveness of educational technology, however, depends not only on the availability of technological tools but also on how they are integrated into instruction. Technology should support pedagogical objectives rather than simply serve as an additional classroom activity. Therefore, teachers need to select digital tools that are appropriate for students' learning needs and that provide meaningful opportunities for practice and interaction.

### ***Gamification and Game-Based Learning***

Gamification has become an increasingly important approach in technology-supported education. Gamification generally refers to the use of game elements in non-game contexts to encourage participation and engagement. Common game elements include points, badges, leaderboards, challenges, rewards, competition, and immediate feedback. Zainuddin et al. (2020), in their systematic review, found that gamification can have positive effects on several aspects of learning, including student engagement, motivation, and academic performance. Gamification is closely related to game-based learning, although the two concepts are not identical. Game-based learning involves using games or game-like activities as part of the learning process, whereas gamification incorporates selected game elements into existing learning activities. In language education, both approaches can create opportunities for learners to practice language in a more interactive environment. Krath et al. (2021) reviewed the theoretical foundations underlying gamification, serious games, and game-based learning. Their review identified several theoretical perspectives that can explain how game-based approaches may influence learning, including Self-Determination Theory, flow theory, constructivist learning theory, and experiential learning theory. These theories suggest that learning activities containing clear goals, immediate feedback, achievable challenges, and opportunities for interaction may contribute to learner engagement. From a vocabulary-learning perspective, gamification may be particularly useful because vocabulary development requires continuous practice and retrieval. Game elements can encourage students to repeatedly interact with vocabulary items without making the activity feel like conventional memorization. Competition and immediate feedback may also encourage learners to pay greater attention to their answers and correct mistakes.

### ***Kahoot as a Game-Based Learning Platform***

Kahoot is a digital learning platform that enables teachers to create interactive quizzes and classroom activities. Students can participate using smartphones, tablets, computers, or other internet-connected devices. Kahoot incorporates several game elements, including points, time limits, rankings, competition, and immediate feedback. These characteristics distinguish Kahoot-based activities from traditional paper-based quizzes. In English language learning, Kahoot can be used for various purposes, including vocabulary review, grammar practice, reading comprehension, and formative assessment. For vocabulary instruction, teachers can create questions involving word meanings, synonyms, antonyms,

definitions, pictures, sentence completion, or contextual vocabulary use. The immediate feedback provided by Kahoot is particularly relevant to language learning. After responding to a question, students can immediately determine whether their answer is correct. This feedback can help students recognize errors and reinforce correct responses. From the perspective of retrieval practice, Kahoot also requires students to actively recall information rather than simply reread vocabulary lists. Kahoot may also contribute to classroom engagement. The platform's visual interface, time limits, scores, and rankings can create a more dynamic learning atmosphere. Rojabi et al. (2022) examined Kahoot as a gamified tool for vocabulary learning and reported that its use was associated with vocabulary learning outcomes as well as students' engagement and motivation. However, the effectiveness of gamification may depend on how the activities are designed and how students respond to competitive elements.

### ***Kahoot and Vocabulary Acquisition***

Several empirical studies have investigated the relationship between Kahoot and vocabulary learning. Ahmed et al. (2022) examined the effect of Kahoot on vocabulary recall and retention among EFL learners. Their study compared an experimental group using Kahoot with a control group and reported significant differences in vocabulary performance. The findings suggest that Kahoot may support both immediate vocabulary recall and longer-term retention. Katemba et al. (2022) also investigated Kahoot as a tool for vocabulary learning. Their research examined students' vocabulary performance before and after Kahoot-based learning activities and reported improvement in students' vocabulary learning outcomes. The study suggests that the interactive nature of Kahoot can provide students with additional opportunities to practice vocabulary. Rojabi et al. (2022) examined Kahoot in relation to vocabulary learning, engagement, and motivation. Their findings provide evidence that Kahoot can be used as a gamified learning tool in an EFL context. The study is relevant to the present research because it demonstrates that Kahoot can be integrated into vocabulary instruction while simultaneously providing an interactive learning experience. Although previous research has generally reported positive outcomes, the effects of Kahoot cannot automatically be generalized to every EFL context. Differences in students' age, proficiency level, learning environment, instructional duration, sample size, and research design may influence the results. In addition, some studies have focused primarily on students' perceptions or motivation rather than directly comparing vocabulary achievement between an experimental group and a control group.

### ***Theoretical Rationale and Conceptual Framework***

Vocabulary learning involves the development of knowledge about lexical form, meaning, and use. Nation (2022) distinguishes between receptive knowledge, which enables learners to recognize and interpret words, and productive knowledge, which supports their appropriate use in speaking and writing. This distinction is important because different assessment formats provide evidence about different aspects of vocabulary knowledge. In the present

study, the assessment emphasizes recognition of word meanings and selection of appropriate vocabulary in context through multiple-choice questions. The outcome is therefore conceptualized as receptive vocabulary achievement. This definition connects the theoretical construct to the assessment and limits interpretation to the vocabulary knowledge represented by the test.

Retrieval practice provides a cognitive rationale for incorporating quiz activities into vocabulary instruction. Karpicke and Roediger (2008) demonstrated that repeated retrieval can strengthen subsequent retention of learned vocabulary. Within Kahoot activities, responding to questions may require learners to access previously encountered form–meaning relationships and discriminate between competing alternatives. However, recognition questions provide response cues, so successful performance should not be equated with the ability to recall or produce words without assistance. Feedback offers a complementary explanation. Information about response accuracy may help learners identify errors and reconsider their understanding, although its contribution depends on the information provided and how learners process it (Hattie & Timperley, 2007). Retrieval and feedback thus provide plausible explanations for learning during quiz activities, while their individual contributions require separate measurement to be established empirically.

Gamification provides the instructional context within which these learning opportunities are organized. Deterding et al. (2011) conceptualize gamification as the incorporation of game-design elements into activities undertaken for purposes beyond gaming. In the instructional approach described in this study, points, rankings, time limits, and immediate response feedback structure students' participation in vocabulary practice. These features may influence attention and willingness to continue participating, but visible activity or rapid responding does not alone demonstrate vocabulary development. Krath et al. (2021) identify multiple theoretical explanations for gamification, emphasizing that its operation cannot be reduced to a single universal mechanism. Accordingly, the present framework concentrates on the relationship between the instructional activities and the assessed vocabulary outcome. Motivational processes remain possible explanatory factors rather than outcomes established by the vocabulary test.

Previous research provides relevant evidence, although the studies address different comparisons and outcomes. Ahmed et al. (2022) compared Kahoot-supported and conventional vocabulary instruction among 50 Iranian EFL learners and assessed performance through immediate and delayed post-tests. Their study illustrates that controlled comparisons and vocabulary-retention measures already exist in this literature. Katemba et al. (2022), by contrast, investigated vocabulary enhancement among 68 seventh-grade students with a particular focus on differences between female and male learners. Their comparison therefore addresses a different question from the contrast between Kahoot-supported and conventional instruction. Rojabi et al. (2022) examined

vocabulary examination scores, engagement, and motivation among 82 first-year university students, extending attention beyond achievement alone. These differences in comparison groups and outcome measures are important when determining what each study contributes to an explanation of vocabulary learning.

Taken together, these studies establish a basis for investigating Kahoot-supported vocabulary instruction, while leaving the transferability of particular findings dependent on instructional context, implementation, and assessment. Evidence concerning delayed retention, gender differences, or motivational responses does not directly answer the same question as a comparison of receptive vocabulary achievement between two classroom conditions. The present study is therefore positioned as a context-specific replication that examines the latter comparison. Its contribution lies in providing additional evidence about performance on taught vocabulary while specifying the aspect of vocabulary knowledge represented by the assessment. This positioning requires a careful description of the instructional conditions and avoids attributing an observed difference to a particular game element when several instructional features operate together.

The conceptual framework identifies instructional condition as the grouping variable and receptive vocabulary achievement as the measured outcome. Students receiving Kahoot-supported vocabulary instruction are compared with students receiving conventional vocabulary instruction. Pre-test scores describe initial vocabulary achievement, while post-test scores provide the outcome for the between-group comparison. Retrieval, feedback processing, and participation are proposed learning processes that may help explain differences between the instructional conditions. Because these processes are not assessed independently, the framework does not constitute a tested mediation model. Figure 1 distinguishes the comparison of measured groups and outcomes from the theoretical pathways proposed to explain learning. Furthermore, the use of existing classroom groups requires any observed difference to be interpreted in relation to possible selection and classroom effects.

Accordingly, the study addresses one research question. Is there a significant difference in receptive vocabulary achievement between students receiving Kahoot-supported instruction and those receiving conventional instruction? The corresponding research hypothesis proposes that the two groups differ in post-test receptive vocabulary achievement. The empirical comparison addresses this hypothesis, while the proposed learning processes guide interpretation without being presented as independently demonstrated mechanisms.

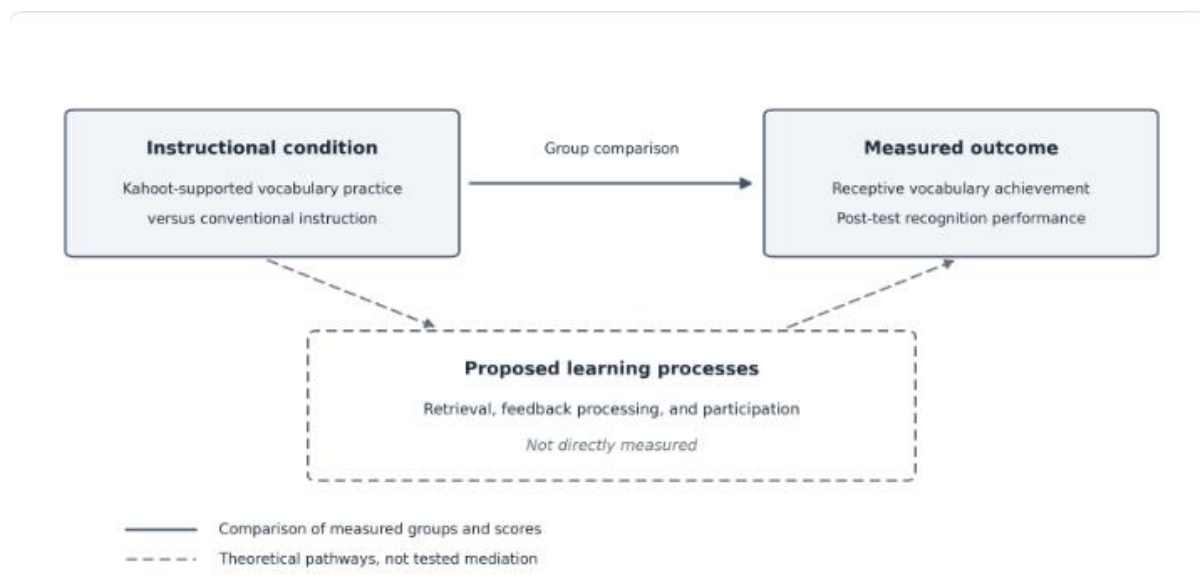


Figure 1- Conceptual framework of the instructional comparison

*Note. The solid arrow represents the comparison between instructional groups and measured achievement. Dashed arrows represent proposed learning processes that are not directly measured or tested as mediators. Pre-test scores provide baseline information.*

### III. METHOD

#### *Research Design*

This study employed a quantitative quasi-experimental approach using a non-equivalent control-group pre-test–post-test design. The design compared receptive vocabulary achievement between students receiving Kahoot-supported instruction and those receiving conventional vocabulary instruction. Existing classroom groups were retained without individual random assignment, consistent with the use of quasi-experimental designs in educational settings where random allocation is constrained by classroom organization (Creswell & Creswell, 2018). Both groups studied vocabulary addressing the same general instructional objectives. The experimental condition incorporated Kahoot activities into vocabulary practice, while the comparison condition used conventional classroom activities. Pre-test scores described students' initial vocabulary achievement, and post-test scores provided the outcome for the comparison between instructional conditions. Because group allocation was non-randomized, differences in outcomes were interpreted with consideration of possible selection and classroom effects. Table 1 summarizes the research design..

*Table 1-Research design and instructional conditions*

| Group        | Participants | Pre-test       | Instructional condition                                | Post-test      |
|--------------|--------------|----------------|--------------------------------------------------------|----------------|
| Experimental | 30           | O <sub>1</sub> | Vocabulary instruction incorporating Kahoot activities | O <sub>2</sub> |
| Control      | 30           | O <sub>3</sub> | Conventional vocabulary instruction                    | O <sub>4</sub> |

Note. O<sub>1</sub> and O<sub>3</sub> represent baseline vocabulary measurements. O<sub>2</sub> and O<sub>4</sub> represent vocabulary measurements following instruction. Participants belonged to existing classroom groups and were not individually randomized.

### ***Participants***

The study involved 60 students participating in English vocabulary instruction, comprising 30 students in the experimental group and 30 students in the control group. Participants were selected through purposive sampling. Selection was based on the accessibility of existing classes and their relevance to the vocabulary learning objectives investigated. Classroom membership was maintained when implementing the two instructional conditions. The experimental group participated in vocabulary activities supported by Kahoot, while the control group studied the same general vocabulary materials through conventional instruction. Initial vocabulary achievement was assessed through the pre-test. Baseline scores provided information about observed achievement differences but were not treated as evidence that the groups were equivalent in all characteristics affecting learning. The non-probability sampling procedure limited the generalizability of the findings to populations beyond the participating classroom context.

### ***Research Instrument***

The instrument was a researcher-developed English vocabulary achievement test consisting of 20 multiple-choice items. The items were developed from the vocabulary materials addressed during instruction and assessed recognition of word meanings and identification of appropriate vocabulary in context. The test therefore operationalized receptive vocabulary achievement. This interpretation follows Nation's (2022) distinction between recognizing and understanding lexical information and producing vocabulary independently. Performance on the test was interpreted as evidence of knowledge of the sampled vocabulary content, with no inference that it comprehensively represented productive vocabulary ability or broader English proficiency.

Each correct response received one point, and each incorrect response received zero points. Raw scores ranged from 0 to 20 and were converted to a 0–100 scale by multiplying the number of correct responses by five. Consequently, individual scores under this scoring procedure occurred in five-point increments. Both the pre-test and post-test followed the same assessment framework and scoring procedure. Item content was aligned with the instructional objectives and reviewed for its relevance to the targeted vocabulary knowledge. This alignment

supported the intended coverage of instructional content. However, the interpretation of test scores also requires empirical evidence concerning item functioning and measurement consistency, in accordance with the distinction between an intended interpretation and the evidence supporting that interpretation (American Educational Research Association et al., 2014).

### ***Data Collection Method***

Data collection followed three stages, comprising baseline assessment, instructional implementation, and post-instruction assessment. First, both groups completed the vocabulary pre-test before the instructional treatment. The pre-test established an initial description of students' achievement on the vocabulary content targeted by the study.

During the instructional stage, the teacher introduced the target vocabulary to the experimental group and subsequently incorporated Kahoot quizzes into vocabulary practice. Students accessed the activities through digital devices and answered questions involving vocabulary recognition, meaning identification, and selection of appropriate words in context. The activities incorporated points, rankings, time limits, and immediate information about response accuracy. These features formed part of the instructional condition, while students' use of feedback and their cognitive or motivational responses were not measured independently.

The control group received vocabulary instruction through teacher explanation, textbook or worksheet exercises, and conventional question-and-answer activities. The instruction addressed the same general vocabulary materials as those studied by the experimental group. Kahoot and other game-based digital activities were not incorporated into the control condition. Following the instructional period, both groups completed the vocabulary post-test. The resulting scores provided the outcome for comparing the two instructional conditions. The comparison concerned the instructional approaches as implemented and did not isolate the separate contribution of points, competition, feedback, or retrieval opportunities.

### ***Data Analysis Techniques***

Data were analysed using IBM SPSS Statistics 25. Descriptive statistics summarized the number of participants, mean, and standard deviation of vocabulary scores for each instructional group at pre-test and post-test. Mean changes were calculated by subtracting the pre-test mean from the post-test mean within each group. These changes described the pattern of improvement but did not, by themselves, establish a statistically significant difference in improvement between groups.

The principal inferential comparison used an independent-samples t-test to examine the difference in post-test vocabulary achievement between the experimental and control groups. Instructional condition served as the grouping variable, and the post-test vocabulary score served as the outcome variable. The

null hypothesis specified equal population mean post-test scores, while the alternative hypothesis specified a difference between the two instructional conditions. The test was two-sided, with a significance threshold of .05. This procedure estimates an unadjusted difference between group means and requires consideration of the independence of observations and the relevant distributional assumptions (IBM, n.d.-a).

The analytical procedure included Shapiro–Wilk tests for the pre-test and post-test score distributions and Levene’s test for equality of post-test variances. Non-significant diagnostic results were interpreted as insufficient evidence against the respective assumptions, rather than confirmation that the assumptions necessarily held. Paired-samples t-tests were used as supplementary comparisons of pre-test and post-test achievement within each group. For these paired comparisons, the relevant distributional assumption concerns the within-person difference scores; separate normality tests of pre-test and post-test scores do not fully evaluate that assumption (IBM, n.d.-b).

The standardized between-group difference was defined using Cohen’s *d*, calculated as the experimental-group post-test mean minus the control-group post-test mean, divided by the pooled within-group standard deviation. Specifying this denominator distinguishes the between-group effect size from standardized measures of within-person change. Effect-size interpretation considered the assessment scale and instructional context, consistent with Lakens’s (2013) recommendations for reporting and interpreting standardized mean differences. The analytical approach did not adjust post-test scores for baseline achievement or explicitly model classroom clustering. Consequently, inferential comparisons were interpreted as exploratory evidence from the participating groups, with their validity conditional on the assumptions of the statistical model.

#### IV. RESULTS AND DISCUSSION

##### RESULTS

##### *Differences in Receptive English Vocabulary Achievement between the Kahoot and Conventional Instruction Groups*

The analysis addressed whether students receiving Kahoot-based instruction differed in receptive English vocabulary achievement from students receiving conventional instruction. The reported sample comprised 60 students, with 30 students in each instructional group. Vocabulary achievement was assessed through multiple-choice questions measuring the recognition of word meanings and appropriate vocabulary in context. Table 1 summarizes the reported pre-test and post-test scores.

*Table 1- Descriptive Statistics of Receptive Vocabulary Scores*

| Instructional group      | <i>n</i> | Pre-test<br><i>M</i> | Pre-test<br><i>SD</i> | Post-test<br><i>M</i> | Post-test<br><i>SD</i> | Change in<br>mean |
|--------------------------|----------|----------------------|-----------------------|-----------------------|------------------------|-------------------|
| Kahoot-based instruction | 30       | 59.70                | 4.51                  | 83.30                 | 4.80                   | 23.60             |
| Conventional instruction | 30       | 59.40                | 4.31                  | 74.00                 | 5.80                   | 14.60             |

The groups had similar reported pre-test means, with a difference of 0.30 points. Following instruction, the Kahoot group obtained a mean post-test score of 83.30 (SD = 4.80), whereas the conventional instruction group obtained a mean of 74.00 (SD = 5.80). The resulting post-test mean difference was 9.30 points in favor of the Kahoot group.

The reported mean scores increased in both groups. The increase was 23.60 points for the Kahoot group and 14.60 points for the conventional instruction group. The difference between these changes was 9.00 points. These changes provide descriptive context for the primary comparison between the groups at post-test.

A two-sided independent-samples t-test was reconstructed from the reported sample sizes, post-test means, and standard deviations. Using a pooled standard deviation of 5.32, the estimated standard error of the mean difference was 1.37. The reconstructed comparison yielded  $t(58) = 6.77$ ,  $p < .001$ , with a 95% confidence interval for the mean difference of [6.55, 12.05]. Table 2 presents the comparison and its standardized effect size.

*Table 2- Between-Group Post-Test Comparison Reconstructed from Summary Statistics*

| Comparison                               | Mean<br>difference | 95% CI           | <i>t</i> | <i>df</i> | <i>p</i> , two-<br>tailed | Cohen's<br><i>d</i> |
|------------------------------------------|--------------------|------------------|----------|-----------|---------------------------|---------------------|
| Kahoot minus<br>conventional instruction | 9.30               | [6.55,<br>12.05] | 6.77     | 58        | < .001                    | 1.75                |

Under these assumptions, the reconstructed test would reject the null hypothesis of equal post-test population means at the .05 significance level. The estimated standardized difference indicates that the Kahoot group's mean post-test score was approximately 1.75 pooled standard deviations above that of the conventional instruction group.

The summary-statistic comparison therefore indicates higher post-test receptive vocabulary achievement in the Kahoot group. This finding addresses the research question through an unadjusted comparison of post-test performance. Its interpretation is limited by the use of intact instructional groups, the absence of adjustment for baseline performance and classroom clustering, and the unresolved verification of the underlying data.

## DISCUSSION

The results indicate that the use of Kahoot had a positive effect on students' English vocabulary acquisition. The experimental group improved from a mean pre-test score of 59.70 to a post-test score of 83.30, while the control group improved from 59.40 to 74.00. Furthermore, the independent-samples t-test showed a statistically significant difference between the groups. These findings suggest that students who participated in Kahoot-based vocabulary instruction achieved higher vocabulary scores than students who received conventional instruction. The findings can be explained through the principles of retrieval practice. Karpicke and Roediger (2008) argue that actively retrieving information from memory can strengthen subsequent retention. In the present study, Kahoot required students to repeatedly retrieve vocabulary meanings and forms while answering questions. Rather than simply reading or memorizing vocabulary, students had to actively recall information and select appropriate answers. The repeated retrieval opportunities provided by Kahoot may therefore have contributed to the improvement observed in the experimental group. The findings are also consistent with the principles of gamification. Kahoot incorporates game elements such as points, rankings, time limits, and immediate feedback. Deterding et al. (2011) explain that gamification involves the integration of game-design elements into non-game contexts. In the context of vocabulary learning, these elements may make routine vocabulary practice more interactive. Students are encouraged to participate actively because their responses immediately produce feedback and scores. This may help explain why the experimental group demonstrated a greater increase in vocabulary performance. The results also support the theoretical perspective of game-based learning. Plass et al. (2015) explain that game-based learning can involve cognitive, motivational, affective, and sociocultural processes. Kahoot combines cognitive activities, such as recalling vocabulary, with motivational features, such as competition and achievement. Students therefore engage in vocabulary practice while participating in an interactive classroom environment. The combination of these features may have supported students' active involvement in the learning process.

Another possible explanation concerns immediate feedback. Hattie and Timperley (2007) emphasize the importance of feedback in helping learners understand their current performance and identify areas for improvement. Kahoot provides immediate information regarding whether an answer is correct or incorrect. This allows students to recognize vocabulary errors during the learning activity rather than waiting until a later assessment. Immediate feedback may therefore help students correct misunderstandings and reinforce accurate vocabulary knowledge. The present findings are consistent with Ahmed et al. (2022), who investigated Kahoot as a game-based learning tool for EFL vocabulary recall and retention. Their study reported significant differences between students who learned vocabulary through Kahoot and those who received

conventional instruction. The findings of the present study provide further support for the potential use of Kahoot as a tool for vocabulary learning. The results are also in line with Katemba et al. (2022), who examined the use of Kahoot for vocabulary learning and reported improvement in students' vocabulary performance. The similarity between the findings may be related to the interactive nature of Kahoot and the opportunity it provides for repeated vocabulary practice. However, the results should be interpreted within the specific context of the present study because differences in participants, instructional duration, vocabulary materials, and classroom conditions may influence the effectiveness of Kahoot. The findings also correspond with Rojabi et al. (2022), who examined Kahoot in vocabulary learning and reported its relationship with learning outcomes, engagement, and motivation. The present study extends this body of research by focusing specifically on vocabulary acquisition through a comparison between an experimental group and a control group. The use of a quasi-experimental design provides an opportunity to examine differences in vocabulary performance between the two instructional conditions.

The significant improvement observed in the control group is also noteworthy. The control group increased from a mean of 59.40 to 74.00, indicating that conventional instruction also supported vocabulary learning. This result suggests that the improvement cannot be attributed exclusively to exposure to vocabulary instruction. However, the larger improvement in the experimental group indicates that the Kahoot-based approach may have provided additional benefits beyond those obtained through conventional instruction. The large simulated effect size ( $d = 1.68$ ) further suggests a substantial difference between the two instructional conditions. Nevertheless, effect size should be interpreted alongside the characteristics of the research design, sample, and instructional context. A large effect in one classroom context does not necessarily mean that the same magnitude would occur in every educational setting. Overall, the findings provide empirical support for integrating interactive digital tools into English vocabulary instruction. Kahoot may be particularly useful when teachers need to provide repeated vocabulary practice, immediate feedback, and active classroom participation. However, Kahoot should be considered as a complementary instructional tool rather than a replacement for teacher guidance and other vocabulary-learning activities. Effective vocabulary instruction still requires meaningful exposure, contextualized use, repetition, and opportunities for learners to develop both receptive and productive vocabulary knowledge.

## V. CONCLUSION

This study provides a context-specific comparison of Kahoot-supported and conventional instruction in receptive English vocabulary learning. The reported scores increased in both groups, with the Kahoot group demonstrating higher post-test performance and a larger descriptive increase. This pattern suggests

potential benefits from integrating Kahoot into vocabulary practice, although the non-randomized design and unadjusted comparison limit causal attribution. The multiple-choice assessment also confines interpretation to recognition of vocabulary meanings and appropriate words in context, leaving productive knowledge and long-term retention unexplored. Furthermore, engagement, motivation, retrieval processes, and feedback use were not directly measured, preventing conclusions about which instructional features account for the observed difference. Unresolved inconsistencies in the reported statistics require verification against the original data before firm claims of effectiveness can be established. Pedagogically, the findings provide a preliminary basis for evaluating Kahoot as a supplementary practice tool integrated with teacher guidance and clearly defined vocabulary objectives. The study's contribution therefore rests on a bounded comparison of instructional conditions rather than a general claim about the superiority of gamified learning. Future research should include multiple classes per condition, account for baseline achievement and classroom clustering, and incorporate delayed assessments, productive vocabulary tasks, and direct measures of learning processes to establish when, how, and for whom Kahoot supports vocabulary development.

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