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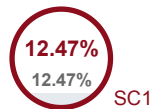
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An Experimental Study of Kahoot in Enhancing Vocabulary Mastery for Elementary Students

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¹) Program Studi Pendidikan Bahasa Inggris, **Universitas Muhammadiyah Sidoarjo, Indonesia** ²) **Program Studi Pendidikan Bahasa Inggris, Universitas Muhammadiyah Sidoarjo, Indonesia** *Email Penulis Korespondensi: yuliasutik@umsida.ac.id **Abstract**

The integration of gamified digital tools in education has been widely recognized for enhancing students' engagement and motivation. However, the application of such tools, particularly Kahoot, in improving specific linguistic competencies such as vocabulary mastery at the elementary school level remains underexplored. Previous research has predominantly focused on students' motivation and general learning outcomes, with limited attention to concrete language gains. Addressing this gap, the present study investigates the effect of Kahoot in supporting vocabulary acquisition among fourth-grade elementary students in Indonesia. A true experimental design was employed, involving 36 **students divided evenly into an experimental group** using Kahoot and a control group that received instructions through textbooks, student worksheets, and explanations from the teacher using a whiteboard as the learning media. Both groups were given identical pre-tests and post-tests to measure vocabulary proficiency. The intervention was conducted over several learning sessions, during which the experimental group engaged with interactive Kahoot quizzes tailored to the curriculum content. The results revealed that while both groups showed significant improvement in vocabulary scores, the experimental group demonstrated a substantially higher gain. Statistical analyses using paired samples t-tests and independent samples t-tests confirmed that the Kahoot-based instruction yielded a greater impact ($p = 0.012$). These findings suggest that Kahoot not only enhances engagement but also contributes meaningfully to vocabulary development. This study underscores the pedagogical value of gamified platforms in early language education. Teachers are encouraged to adopt digital tools like Kahoot to foster active learning, especially in contexts where conventional methods may fall short in stimulating vocabulary retention. Further

research could extend this model to other language domains and examine its long-term effects.

Keywords: Kahoot, Gamification, Vocabulary Learning, Elementary English Education

Abstrak

Integrasi alat digital yang diintegrasikan dengan elemen permainan dalam pendidikan telah diakui secara luas sebagai cara untuk meningkatkan keterlibatan dan motivasi siswa. Namun, penerapan alat-alat tersebut, khususnya Kahoot, dalam meningkatkan kompetensi linguistik spesifik seperti penguasaan kosakata pada tingkat sekolah dasar masih kurang dieksplorasi. Penelitian sebelumnya sebagian besar berfokus pada motivasi siswa dan hasil belajar secara umum, dengan sedikit perhatian pada peningkatan bahasa yang konkret. Untuk mengatasi kesenjangan ini, studi ini menyelidiki efektivitas Kahoot dalam mendukung penguasaan kosakata di kalangan siswa kelas empat sekolah dasar di Indonesia. Desain eksperimental sejati digunakan, melibatkan 36 siswa yang dibagi rata menjadi kelompok eksperimen yang menggunakan Kahoot dan kelompok kontrol yang menerima instruksi melalui media konvensional. Kedua kelompok diberikan tes pra dan pasca yang identik untuk mengukur kemahiran kosakata. Intervensi dilakukan selama beberapa sesi pembelajaran, di mana kelompok eksperimen berinteraksi dengan kuis Kahoot interaktif yang disesuaikan dengan konten kurikulum. Hasil menunjukkan bahwa meskipun kedua kelompok menunjukkan peningkatan signifikan dalam skor kosakata, kelompok eksperimen menunjukkan peningkatan yang jauh lebih tinggi. Analisis statistik menggunakan uji t sampel berpasangan dan uji t sampel independen mengonfirmasi bahwa instruksi berbasis Kahoot memberikan dampak yang lebih besar ($p = 0.012$). Temuan ini menunjukkan bahwa Kahoot tidak hanya meningkatkan keterlibatan tetapi juga berkontribusi secara berarti pada pengembangan kosakata. Studi ini menyoroti nilai pedagogis platform gamifikasi dalam pendidikan bahasa awal. Guru didorong untuk mengadopsi alat digital seperti Kahoot untuk mendorong pembelajaran aktif, terutama dalam konteks di mana metode konvensional mungkin kurang efektif dalam merangsang retensi kosakata. Penelitian lebih lanjut dapat memperluas model ini ke domain bahasa lain dan mengeksplorasi efek jangka panjangnya.

Kata kunci: Kahoot, Gamifikasi, Pembelajaran Kosakata, Pendidikan Bahasa Inggris Dasar

Introduction

The advancements in technology in education have facilitated the emergence of a diverse array of digital learning mediums that are increasingly characterized by their innovative and interactive nature. In contemporary educational paradigms, technology serves not merely as an instrument for learning but also as a mechanism to enhance student motivation and engagement throughout the educational process [1]. The younger demographic, particularly those enrolled in elementary education, demonstrates a heightened interest in the learning experience when utilizing media beyond textbooks, such as visual and interactive educational tools, thereby underscoring the necessity for learning media that can effectively captivate their attention [2].

One of the main challenges in English language instruction at the elementary level is maintaining students' interest and encouraging active participation. Conventional learning media, such as textbooks, often fail to foster engagement and can limit opportunities for interactive language practice [3]. To address this, various types of instructional media-visual (pictures, flashcards, videos), audio (songs, voice recordings), interactive (apps, games), and print (storybooks, posters)-can be integrated into English language learning to increase motivation and involvement [4]. These tools promote active learning and help students participate meaningfully in the classroom.

In recent years, Kahoot has emerged as one of the most popular interactive platforms in education. As a game-based learning tool, it integrates features like time-based quizzes, instant feedback, and competitive scoring to encourage participation. Research shows that Kahoot can foster student engagement and simultaneously enhance learning outcomes [5], as its competitive and interactive features make learning more enjoyable and motivating [6]. A study by Stakhova et al [7] highlighted that Kahoot not only enhances student engagement but also helps improve teachers' digital competence. Additionally, [8] found that Kahoot positively influences classroom dynamics and student motivation, while [9] emphasized its potential to create more engaging environments that lead to improved outcomes. Even in higher education contexts, such as in a medical course, Kahoot has been shown to improve and predict final grades [10].

While most studies emphasize motivation and engagement, this study focuses on language-specific outcomes, namely, vocabulary mastery and pronunciation. These linguistic aspects are often underrepresented in existing studies of Kahoot. At the elementary level, students still struggle with English vocabulary and pronunciation due to limited exposure and the prevalent use of conventional, passive instructional methods [11][12][13]. Moreover, the lack of digital and interactive tools in many classrooms can reduce student interest and participation. Studies suggest that integrating tools like Kahoot can overcome these barriers by promoting interactive and responsive learning environments [14][15].

Therefore, this study investigates the role of Kahoot in enhancing elementary students' English vocabulary mastery, distinguishing itself from prior research by emphasizing specific linguistic outcomes. By comparing the use of Kahoot with textbooks, student worksheets, and teacher explanations using a whiteboard as a learning media, this study provides insights into how digital gamification can support young learners in acquiring core language skills more effectively. Thus, the research question is: To what extent does the use of Kahoot improve vocabulary mastery compared to textbooks, student worksheets, and teacher explanations using the whiteboard as a learning media among elementary school students?

Research Method

Research Design

This study employed a quantitative approach using a true experimental design to examine the effect of Kahoot in enhancing elementary school students' vocabulary mastery. **A pre-test was administered to both the experimental and control groups** to assess students' baseline vocabulary knowledge before any instructional intervention. Following this, the treatment phase was conducted over several English learning sessions, during which the experimental group received instruction using Kahoot-based interactive quizzes, while the control group was taught using textbooks, student worksheets and whiteboard explanations as learning media. After the instructional period, a post-test with the same format as the pre-test was given to both groups to measure the improvement in vocabulary mastery and to determine the effectiveness of the respective teaching methods. The design involved two groups: an experimental group that used Kahoot as an interactive learning tool, and a control group that uses textbook teaching media, student worksheets, and explanations from the teacher using a whiteboard. The research was conducted from January to February 2025, during several English learning sessions with 4th-grade elementary school students with two classes, 4A and 4B, a total of 36 students, each class consisting of 18 students. The study was carried out in schools that had sufficient access to technological devices such as laptops, projectors, or mobile phones to ensure the effective implementation of Kahoot. The rationale for selecting this grade level was that elementary students are in the early stage of language development, and thus are more likely to benefit from interactive learning tools like Kahoot.

Participants

The participants consisted of 36 fourth-grade students from SDN Wunut 2, a school equipped with adequate technological facilities. The students were drawn from two classes, 4A and 4B, with each class comprising 18 students. They were divided evenly into two groups: Experimental group: 18 students received instruction using Kahoot as the learning medium. Control group: 18 students received instruction using conventional methods, such as textbooks and whiteboard explanations. The students were selected from two intact classes and were randomly assigned as control and experimental groups.

Instruments and Procedures

Vocabulary mastery was measured using pre-tests and post-tests administered to both groups. These tests assessed students' comprehension of English vocabulary in both written and oral formats and were designed based on the theme "Daily Activities", aligned with the fourth-grade English curriculum.

The test consisted of six parts with various task types to evaluate different aspects of vocabulary mastery:

1. Short Answer Questions (e.g., mentioning daily activities),
2. Translation Tasks (translating vocabulary items from English to Indonesian)
3. Sentence Reordering (arranging jumbled words into proper English sentences)
4. Gap-Fill Exercises (selecting appropriate verbs to complete simple sentences)
5. Free/Guided Writing (writing 3 simple sentences about daily routines)
6. Multiple Choice/Matching Tasks (in post-test only).

Each test included approximately 15-18 items, and a clear assessment rubric was used to score responses objectively. Each section carried a specific score weight, with the total maximum score being 100 points.

The tests were validated through expert assessment by two English language education lecturers and one English teacher at SDN Wunut 2, who reviewed the relevance of the content, clarity, and alignment of the items with the curriculum. Additionally, a pilot test was conducted with a different fourth-grade class to ensure the reliability and clarity of the instructions and question format.

The pre-test (Q1) was administered before the learning intervention to determine the baseline vocabulary knowledge of the students. After the series of instructional sessions, a post-test (Q2) was conducted using the same format to assess improvements. The treatment for the control group involved conventional instructional methods, including the use of textbooks, printed worksheets, and explanations from the teacher using whiteboards or visual aids. In contrast, the experimental group used Kahoot quizzes as the primary instructional tool. First, the teacher teaches the "daily activity" material using PPT. Before teaching with Kahoot, the teacher first explains Kahoot as a learning medium to the students. After that, the teacher uses Kahoot, which contains vocabulary quizzes relevant to the material being taught, which students complete individually or in groups using the device. Feedback and explanations are provided based on the Kahoot responses, especially focusing on incorrect answers.

Data Analysis

The quantitative data collected from the pre-test and post-test scores were analyzed using statistical tests. Paired sample t-tests were conducted within each group to examine improvements before and after the intervention. An independent sample t-test was used to compare the post-test scores between the experimental and control groups. A significance level of 0.05 was used to determine the statistical significance of the results.

Results and Discussion

This section presents the results of the statistical analyses conducted to examine the effect of Kahoot in improving elementary school students' vocabulary mastery. The data analysis included descriptive statistics, **paired samples t-tests, and independent samples t-tests.**

Descriptive Statistics

Table 1 shows the mean scores, standard deviations, and standard errors of the pre-test and post-test results in both control and experimental groups.

Table 1. Descriptive Statistics of Vocabulary Scores

Variabel	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 Pretest	Control	61.0556	18	18.17067
Posttest Control	67.3889	18	16.05190	3.78347
Pair 2 Pretest	Eksperimen	54.0556	18	18.22562
Posttest Eksperimen	80.3333	18	12.98688	3.06146

As seen in Table 1, **both groups showed improvement in their post-test scores. However, the experimental group that used Kahoot exhibited a substantially higher increase.**

Paired Samples T-Test

Table 2 presents the results of paired samples t-tests conducted within each group to assess whether the **pre-test and post-test** differences were statistically significant.

Table 2. Paired Samples T-Test Results

Mean	Difference	Std. Deviation	Std. Error	Mean	95% CI (Lower)	95% CI (Upper)	t	df	Sig. (2-tailed)	Pair 1	-6.33333	4.75271
1.12022	-8.69687	-3.96987	-5.654	17	0.000							
Pair 2	-26.27778	12.52201	2.95147	-32.50483	-20.05073	-8.903	17	0.000				

As shown in Table 2, both the control and experimental groups experienced statistically significant improvements in their vocabulary scores from pre-test to post-test: Control group:

The mean score increased by 6.33 points (from 61.06 to 67.39).

The improvement was statistically significant ($t(17) = -5.654, p = .000$), indicating that even conventional methods contributed to vocabulary learning. Experimental group (Kahoot): The mean score increased by a much larger margin 26.28 points (from 54.06 to 80.33). This increase was also statistically significant ($t(17) = -8.903, p = .000$). Both instructional methods led to learning gains, but the students who used Kahoot showed four times greater improvement in vocabulary mastery. This suggests that Kahoot is a significantly more powerful tool for vocabulary development compared to conventional **methods**.

Independent Samples T-Test

Table 3 displays the results of the independent samples t-test comparing **the post-test scores of the** control and experimental groups.

Table 3. **Independent Samples T-Test for** Post-Test Scores

	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% CI (Lower)	95% CI (Upper)
Equal variances assumed	-2.660	34	0.012	-12.944	4.867	-22.835	-3.054
Equal variances not assumed	-2.660	32.582	0.012	-12.944	4.867	-22.851	-3.038

As presented in Table 3, the comparison of post-test scores between the two groups revealed a statistically significant difference: **The experimental group outperformed the control group** by 12.94 points on average. The result was statistically significant ($t(34) = -2.660, p = .012$) **with a 95% confidence interval ranging from** -22.83 to -3.05. Levene's test confirmed that equal variances could be assumed ($p = .443$), validating the t-test result. In addition to statistical significance, **the effect size (Cohen's d)** for the difference in post-test scores **between the experimental and control groups was** 0.89, indicating a large and educationally meaningful effect of Kahoot on vocabulary acquisition. This confirms that the Kahoot-based instructional method resulted in significantly better vocabulary outcomes than the conventional method. **The difference is not only statistically significant but also educationally meaningful**, given the large score gap and consistent performance improvement.

Discussion

The findings of this study support the growing body of research highlighting the benefits of integrating gamified digital tools such as Kahoot into language instruction, particularly at the elementary level. The significant improvement in vocabulary mastery among students in the experimental group, as demonstrated through both paired and independent samples t-tests, confirms the effect of Kahoot as an engaging and impactful instructional medium. The results align with previous studies, which emphasize the potential of gamification to enhance learner engagement, motivation, and academic outcomes [5][6][8][9]. In this study, students who participated in Kahoot-based learning activities showed greater vocabulary improvement than those who used textbooks, student worksheets, and teacher explanations using a whiteboard as a learning media. This reinforces the theoretical perspective that interactive, student-centered learning environments, especially those involving competition, feedback, and real-time participation, can lead to more meaningful and retained learning experiences [16]. From a pedagogical standpoint, the use of Kahoot is congruent with constructivist learning theories proposed by Piaget and Vygotsky, which suggest that children learn best when they are actively involved in constructing knowledge through social interaction and contextual engagement. Kahoot provides this through its interactive quiz features, time-based challenges, and collaborative play, which encourage learners to process information deeply and respond actively [16][17].

Kahoot's design, which integrates visual prompts, auditory cues, and interactive actions, aligns with the principles of multisensory learning. This approach enables students to process vocabulary input through multiple channels, thereby strengthening retention and recall. Multisensory methods have been shown to be particularly effective in language acquisition for young learners, as they stimulate different cognitive pathways and cater to diverse learning preferences [17]. Moreover, Kahoot's ability to function as a formative assessment tool enabled teachers to immediately address misconceptions and adjust instruction accordingly. This contrasts with conventional instruction in the control group, where feedback tended to be delayed and less interactive. The immediacy and responsiveness of Kahoot-based learning align with best practices in language teaching, which emphasize continuous feedback as a driver of improvement [18]. While this study primarily measured vocabulary acquisition, qualitative observations also suggested positive effects on pronunciation and oral confidence among students in the experimental group. Although these were not quantitatively assessed, they align with prior studies, which found that digital platforms can lower affective barriers to speaking and encourage more spontaneous language use [11]. However, several limitations must be acknowledged. Some students in the experimental group expressed stress due to the time limits in Kahoot quizzes, which may have affected their performance. This concern reflects earlier findings on the potential downsides of time-based gamification [6]. Thus, educators are encouraged to adapt the pace or provide collaborative play options to ensure inclusivity. Another consideration is technological access. While this study was conducted in a school with sufficient infrastructure, many schools, especially in rural or underserved regions, may lack the devices or connectivity needed to implement Kahoot effectively [9]. Bridging this digital divide remains a critical challenge for education stakeholders. Culturally, the integration of Kahoot appears compatible with the current shift in Indonesian education toward more active and student-centered methodologies [19]. As the national curriculum emphasizes communicative competence and learner autonomy, Kahoot offers a practical tool for achieving these goals in vocabulary instruction. Finally, the versatility of Kahoot opens opportunities for further application beyond vocabulary. Future studies could explore its integration into grammar instruction, reading comprehension, or writing tasks by designing quizzes that assess contextual usage or sentence construction. As suggested in previous literature, gamified tools have the potential to influence long-term academic performance when used consistently and meaningfully [20]. In sum, this study provides empirical support for the use of Kahoot as an effective medium to improve vocabulary mastery in elementary English education. Its strengths lie in its interactivity, motivational appeal, immediate feedback, and alignment with contemporary educational paradigms. With thoughtful implementation, Kahoot can become a valuable asset in the language learning process for young learners.

Conclusion

The outcomes of this study affirm that game-based digital media, particularly Kahoot, can significantly elevate students' vocabulary proficiency in elementary English classrooms. By offering an interactive environment characterized by real-time feedback, adaptive challenges, and engaging visuals, Kahoot proved to be more effective than conventional instructional methods in supporting vocabulary growth. The statistical evidence underscores its impact not only on academic achievement but also on learners' motivation and participation. Given these results, educators are encouraged to incorporate gamified tools into language instruction to create more responsive and learner-centered experiences. This approach is especially valuable for young learners who benefit from multisensory engagement and immediate reinforcement. Beyond vocabulary acquisition, the flexible structure of platforms like Kahoot offers potential for broader application across language domains. Future investigations may explore long-term retention, scalability

across different school contexts, and integration with other instructional strategies. As schools increasingly adopt digital resources, thoughtful implementation of interactive technologies holds promise for transforming conventional language education into a more dynamic and inclusive process.

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