The Effectiveness of Kahoot! in Enhancing Vocabulary Skills Among Sixth-Grade Students

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Abstract

Vocabulary plays a vital role in language learning, supporting listening, speaking, reading, and writing skills. Many students struggle with vocabulary due to unengaging teaching methods, leading to poor retention and low motivation. To address this, gamified tools like Kahoot! have been introduced to make learning more interactive and enjoyable. This study investigates the impact of Kahoot! on vocabulary improvement among 18 sixth-grade students at SD Negeri Penggarutan 01 Brebes. Using a pre-experimental design, students took vocabulary tests before and after using Kahoot!, with results analyzed via SPSS 22. Findings revealed a significant increase in average scores from 72.50 to 79.17, with a p-value of 0.000, indicating statistical significance. The study concludes that Kahoot! effectively enhances vocabulary learning by boosting student motivation, engagement, and retention.

Keywords: *Gamification, Kahoot!App, Vocabulary Skill*

INTRODUCTION

Vocabulary plays a crucial role in language learning, as it directly impacts the four main skills: listening, speaking, reading, and writing. In listening, a broad vocabulary helps students comprehend spoken messages more effectively. In speaking, selecting the right words ensures clear communication and understanding. In reading, a strong vocabulary allows students to grasp the meaning of texts, while in writing, an extensive word bank enables them to express their thoughts clearly and effectively. Limited vocabulary can hinder all these skills, making communication and comprehension more challenging. Therefore, mastering vocabulary is essential for language proficiency, as it serves as the foundation for all aspects of communication.

The term “vocabulary” refers to a group of words with meaning (Said, 2020). This means that vocabulary is not just a collection of letters; those letters must be put together correctly to create meaning. Vocabulary is an important part of learning a language because it helps students understand and use the language. As Clouston (2013) explained, communication cannot happen without vocabulary, and only limited communication can occur without grammar. This shows that vocabulary plays a key role in learning a language, especially for communication, even if grammar skills are weak. Vocabulary is the foundation of any language, and how well students can use a language depends on how much vocabulary they know. In short, vocabulary is a set of meaningful words and is essential for success in language learning.

In learning English, vocabulary is very important. Students need enough vocabulary to understand lessons, which is often provided by the teacher. Students with a larger vocabulary find it easier to understand the material, while those with a smaller vocabulary may struggle. Because of this, teachers should use interesting ways to teach vocabulary to encourage students to enjoy learning it. One effective method is to use games in teaching. English teachers have begun using computer technology to attract student's attention and increase their interest in learning the English language (Katemba, 2022)

Games are an activity that students enjoy, and they can help students experience language in an engaging way rather than just studying it (Wright, 2006). Gamification, which means applying game-like elements to education, is a useful tool for teaching vocabulary. It turns learning into an interactive and enjoyable experience, where students take part in activities to learn. This doesn't mean all tasks are purely for fun, but game principles can be used to teach vocabulary in a way that meets educational goals. Playing games helps students interact with words, and gamification can make learning more enjoyable, increasing motivation and engagement while supporting vocabulary growth (Kingsley & Hagen, 2017). Therefore, using gamification in vocabulary learning is highly beneficial for teachers and students.

Gamification includes various tools that can be used in the classroom, such as Quizzes, Educandy, Tic Tac Toe, Word Wall, and Kahoot!. Each tool offers unique features to help with learning. Among these, Kahoot! is particularly effective for teaching English vocabulary. It encourages students to think and understand vocabulary as they answer questions quickly and accurately. The interactive features of Kahoot! fit well with vocabulary lessons (Purnawan, 2022). Because of this, Kahoot! is considered a useful tool for motivating students and helping them remember vocabulary.

Kahoot! is a game-based learning platform that has been widely used in classrooms to enhance vocabulary acquisition. Several studies have demonstrated its effectiveness in improving students' vocabulary retention and engagement. For instance, Mawarni (2021) found that integrating Kahoot! into classroom routines enhances student engagement and competitiveness, fostering a more effective learning environment. This study emphasized that students participated more actively in class when Kahoot! was introduced, as the element of competition motivated them to perform better. Similarly, Hadijah (2020) reported that students using Kahoot! showed improved vocabulary recall compared to traditional methods. Her study highlighted that gamification elements such as instant feedback, scoring, and leaderboard rankings contributed to a deeper learning experience.

Masoud (2020) conducted an experimental study and concluded that using Kahoot! twice a week significantly boosted students' vocabulary scores. This study compared two groups, one using Kahoot! for vocabulary learning and another relying on conventional methods. The results demonstrated a substantial improvement in the Kahoot! group, indicating that frequent exposure to interactive quizzes reinforced students' retention of new words. The study also pointed out that students exhibited higher motivation levels, as they were eager to participate in Kahoot!-based activities, making learning more enjoyable.

Further research supports these findings. Mawarni (2021) found that Kahoot! helps reinforce vocabulary retention through its quiz-based format, allowing students to learn in an engaging environment. This study also highlighted the role of gamification in reducing anxiety in language learning, as students felt less pressure when answering questions in a game format rather than through traditional oral questioning. Similarly, Rahman and Angraeni (2020) examined game-based learning and discovered that students using digital tools like Kahoot! demonstrated higher

motivation and improved vocabulary skills. They argued that technology-integrated classrooms encouraged active participation, which is crucial in the language acquisition process.

Smith et al. (2021) emphasized the role of gamification in increasing participation and interaction, leading to better vocabulary acquisition. Their research indicated that students who used Kahoot! were more likely to engage in peer discussions, as they often reviewed incorrect answers together to understand mistakes. The study further suggested that the collaborative nature of Kahoot! quizzes promoted a sense of camaraderie, making students feel more confident in their learning journey.

Additionally, a study by Echeverría et al. (2021) highlighted the positive impact of digital games on language learning, indicating that Kahoot! fosters a more dynamic and enjoyable learning experience. Their findings suggested that gamified learning environments make vocabulary practice feel less like a chore and more like an interactive challenge, which sustains students' interest over time. Research by Cornillie et al. (2022) suggested that game-based learning tools enhance word recognition and comprehension when integrated with instructional strategies. This research pointed out that teachers play a crucial role in ensuring that digital tools like Kahoot! are used effectively alongside traditional teaching methods to maximize learning outcomes.

Whittle (2023) found that the competitive nature of Kahoot! increases students' willingness to learn new words. Her research suggested that students often viewed Kahoot! as a fun and friendly competition, which encouraged them to pay closer attention to new vocabulary introduced in lessons. Finally, a study by Hung et al. (2023) confirmed that gamified learning environments, such as Kahoot!, help improve students' vocabulary performance by encouraging active participation and repeated exposure to new words. This study also mentioned that repeated exposure through quizzes allowed for spaced repetition, an essential technique in memory retention. Research by Katemba et al (2022) found a significant difference in vocabulary gains between male and female students, supporting the use of Kahoot! games as an effective method for teaching vocabulary.

These studies collectively highlight that Kahoot! is an effective tool for vocabulary learning, helping students improve their retention, engagement, and overall language proficiency. With the growing importance of technology in education, incorporating game-based learning into traditional classroom settings can create a more engaging and effective learning experience. While traditional vocabulary instruction often relies on rote memorization, gamification transforms learning into an active and interactive process. This shift is particularly important in modern educational settings where students are more accustomed to digital learning environments. However, despite the strong evidence supporting the benefits of Kahoot!, most studies have been conducted at the secondary or university level, leaving a research gap in understanding its impact on young learners, particularly at the primary level.

Based on initial research through observations and interviews in the sixth grade at SD Negeri Penggarutan 01 Brebes, several vocabulary-related problems were identified. Students had a limited vocabulary, as reflected in their scores, which were below the Minimum Mastery Criteria (KKM). Many struggled to remember words, particularly those with multiple meanings, and showed little interest in the learning process due to repetitive teaching methods that made lessons less engaging. Unlike previous studies that have focused on older students or general language learning, this study specifically investigates whether game-based learning with Kahoot! can positively impact the vocabulary skills of primary school students.

Given these findings, this research aims to investigate whether Kahoot! is an effective tool for improving vocabulary retention and motivation among sixth-grade students. Specifically, the study seeks to answer the following questions:

(1) How does the use of Kahoot! impact students' vocabulary mastery?

(2) How does Kahoot! influence students' engagement in vocabulary learning?

By exploring these aspects, the study aims to provide insights into the potential of Kahoot! as an innovative approach to vocabulary learning in the classroom. While previous studies have highlighted the benefits of game-based learning, there is still limited research on its specific effects on young learners in Indonesian primary schools. This research addresses this gap by focusing on a younger demographic, providing new insights into the effectiveness of digital learning tools at the primary level.

The findings of this research will not only contribute to understanding the effectiveness of Kahoot! but also offer valuable implications for educators seeking to integrate digital tools into language instruction. As technology continues to shape education, it is essential to explore and implement strategies that enhance student learning outcomes. Gamified learning, particularly through platforms like Kahoot!, presents an opportunity to bridge the gap between traditional teaching methods and modern digital innovations. By ensuring that students are engaged, motivated, and actively participating in their learning process, teachers can create a more dynamic and effective educational experience that fosters long-term vocabulary development and language proficiency. Furthermore, this study will provide practical recommendations for teachers on how to optimize Kahoot! for different student needs, ensuring that its benefits are maximized in primary school settings.

METHODS

Using a quantitative research approach with a pre-experimental design, the study involved 18 students selected through purposive sampling. Vocabulary tests were administered as both pre-test and post-test to assess the impact of Kahoot! on students' vocabulary skills, with data analysed using SPSS 22, including descriptive statistics and a paired sample t-test.

Research design

This research used quantitative approach specifically experimental research. Experimental research was conducted to examine the effect of certain treatments or independent variable on the variables being treated or dependent variable. Quasi-experimental, true-experimental, pre-experimental, and factorial designs are the four types of experimental research designs that can be employed (Sugiono, 2013). The researcher used pre-experimental design.

Research participants and Sampling Procedures

The researcher used the pre-experimental method which consist of one group with pre-test, treatment, and post-test. Pre-experimental research is an observational approach to conducting experiments, and it is done without making comparisons (without control group). Pre-experimental techniques were used by researchers to determine whether the intervention using the Kahoot! application would have an impact on a small sample of people.

Sample size, Power and Precision

The population of this study consisted of all students at SD Negeri Penggarutan 01, with the sample focused on the sixth grade, comprising 18 students. The study aimed to explore how the Kahoot! application impacted English vocabulary learning by evaluating its effectiveness in teaching vocabulary following the treatment.

Data Collection

Tests were used as an instrument in this research, consisting of 15 multiple-choice questions and 10 fill-in-the-blank items. The validity of the tests was determined through T-tests, homogeneity tests, and reliability analysis. The tests were administered as a pre-test before the treatment and a post-test after the treatment to measure the students' vocabulary comprehension and evaluate the impact of Kahoot! on their learning outcomes.

Measures and Covariates

The researchers used descriptive statistics in analyzing the data. The mean score and standard deviation were used by the researcher to determine the student's ability. Using the SPSS 22 for Windows application, the present researchers determined the mean score and standard deviation. The result of the data was shown after the present researchers compared the result of the pre-test and post-test. Furthermore, the present researchers analyzed the hypothesis testing which was aimed at knowing whether the alternative hypothesis was accepted or not. In this study, it is used Paired Sample T-test of SPSS version 22. The SPSS statistic shows the result of the procedure that indicates whether the alternative hypothesis is accepted or rejected (Ostertagová & Ostertag, 2013).

Manipulations or Interventions

To analyze the data from the pre-test and post-test, the researcher used SPSS with the following steps:

1. The participants took a pre-test to measure their initial vocabulary skills.
2. The Kahoot! application was used as a treatment to enhance participants' vocabulary and motivation (4^{th} meeting).
3. The participants took a post-test to measure the impact of the intervention.
4. A paired t-test was conducted using SPSS to compare the pre-test and post-test results, identifying any significant differences in performance.

RESULTS

Before conducting the treatment, the researchers collected and analyzed the pre-test data. The pre-test results showed that the highest score was 85, while the lowest was 20. The mean score was 72.5, with a standard deviation of 20.14, indicating considerable variation in students' vocabulary mastery levels.

For the treatment, students were instructed to download the Kahoot! app and engage in vocabulary exercises prepared by the teacher. The exercises covered four main parts of speech: verbs, adjectives, pronouns, and nouns. Initially, students worked in groups to answer vocabulary questions. As they became familiar with the process, they completed quizzes individually. The treatment was conducted weekly over four meetings, during which students showed enthusiasm, actively asked questions, supported their peers, and utilized an English dictionary to assist their learning.

After completing the treatment, the post-test was conducted. The highest score increased to 100, while the lowest score was 30. The post-test mean score rose to 79.17, with a slightly higher standard deviation of 21.30, indicating improved vocabulary mastery but also some variation in individual performance. Utilizing SPSS, the data was processed to produce a description of the information. The following table displayed the data description results that was calculated using SPSS based on the outcomes of the pre-test and post-test procedures.

Table 1. Descriptive statistics of Pre-test and Post-test

Statistic	Count	min	max	Mean	Std. Deviation
Pre-test	18	20	85	72.5	20.14
Post-test	18	30	100	79.17	21.30

According to the description of the data provides an initial overview of the students' performance. It shows that in the pre-test, scores ranged from a low of 20 to a high of 85, with an average (mean) score of 72.5 and a standard deviation of 20.14, indicating a fair amount of variability among students. In the post-test, after the treatment, scores improved—ranging from 30 to 100—with an increased mean of 79.17 and a slightly larger standard deviation of 21.30. This suggests that on average, students performed better after the intervention, although the spread of scores also increased, hinting at differences in how much individual students benefited from the treatment.

According to the description of the data performed in the above table, the mean of post-test score increased from the pre-test score.

Following this analysis, normality test was the next step that was done by the researcher after getting the data description. The aim of the normality test is to get the information whether the data is distributed normally or not. The following table displays the results of the Shapiro Wilk test-based normality test that was performed in SPSS:

Table 2. Test of Normality

	Kolmogorov-Smirnov		Shapiro-Wilk	
	Statistic	**Sig.**	**Statistic**	**Sig.**
Pre-test	0.211	0.348	0.859	0.012
Post-test	0.238	0.222	0.860	0.012

The significance value of the post-test is 0.012 which shows that is higher than 0.05. As a result, the data is distributed normally.

To further validate the data, a homogeneity test was conducted to determine whether the data had homogeneous variances. This test was performed using statistical analysis in SPSS. The table below displays the result of the homogeneity test:

Table 3. Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
0.046	1	34	0.832

Following the normality assessment, the Test of Homogeneity of Variances table checks whether the variances of the pre-test and post-test scores are equal. Using Levene's Test, the table reports a statistic of 0.046 and a significance value of 0.832. Because this significance value is much higher than the conventional threshold of 0.05, it confirms that the variances are homogeneous. This homogeneity is crucial for ensuring that the subsequent comparison of means (using a paired t-test) is valid and not affected by unequal variability between the two sets of scores.

Following this, the researcher employed the Paired Sample T-Test in SPSS to further analyze the data. Paired sample t-test was used because there was only one class included in the sample. The researcher analyzed the data to test the research hypotheses which are:

Null hypothesis (H0): There is no improvement of students' vocabulary mastery before and after using Kahoot! Application.

Alternative hypothesis (H1): There is an improvement of students' vocabulary mastery before and after using Kahoot! Application.The result of the paired sample t-test is presented in the table below:

Table 4. Paired Samples Statistics

	Mean	**N**	**Std. Deviation**	**Std. Error Mean**
Pair 1 Pre-Test	72.50	18	20.14	4.75
Pair 1 Post-Test	79.17	18	21.30	5.02

The Paired Samples Statistics table then summarizes the core performance metrics of the two tests. It reiterates that the pre-test had a mean score of 72.50 (with a standard deviation of 20.14) and that the post-test improved to a mean of 79.17 (with a standard deviation of 21.30). The inclusion of the standard error of the mean for both tests provides additional insight into the reliability of these average scores. The clear increase in the mean score supports the initial observation of improvement in student performance following the use of the Kahoot! application.

The average score of the post-test is greater than the average score of the pretest. Then, the value of the correlation that is determined by the paired sample t-test is performed in the table below:

Table 5. Paired Samples Test

Pair	Paired Differences					T	Df	Sig. (2-tailed)
				95% Confidence Interval of the Difference				
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
1 (Pretest - Posttest)	-1.056E1	4.82	1.13608	-12.78673	-8.33327	-9.295	17	.000

Finally, the Paired Samples Test table presents the results of the paired sample t-test, which statistically examines whether the difference between pre-test and post-test scores is significant. The table shows a mean difference of –10.56 (calculated as the pre-test score minus the post-test score), a t-value of –9.295, and 17 degrees of freedom. Most importantly, the two-tailed significance (p-value) is 0.000, which is well below the 0.05 threshold, indicating that the improvement in scores is statistically significant. Additionally, the 95% confidence interval for the difference (from approximately –12.79 to –8.33) does not include zero, further reinforcing that the observed improvement is not due to chance. In conclusion, the significance value of the two-tailed paired sample t-test is 0.000, as presented in the table above. The two-tailed paired sample t-test's significance value is lower than 0.05, which means that the alternative hypothesis (H1) must be accepted in place of the null hypothesis (H0).

Together, these tables tell a clear story: the intervention using the Kahoot! application appears to have had a positive and statistically significant impact on the students' vocabulary mastery, as evidenced by the increased post-test scores and confirmed by rigorous statistical testing.

DISCUSSION

The findings of this study indicate a statistically significant improvement in students' vocabulary mastery following the use of the Kahoot! application as a learning tool. The increase in the mean score from 72.5 in the pre-test to 79.17 in the post-test suggests that the game-based learning approach facilitated by Kahoot! had a positive impact on vocabulary acquisition. This aligns with previous research emphasizing the effectiveness of gamification in education, particularly in enhancing motivation and engagement (Zarzycka-Piskorz, 2016). The observed improvement is consistent with theories of active learning, which propose that interactive and engaging learning environments lead to better retention and understanding of material (Bonwell & Eison, 1991).

The enthusiasm displayed by students during the treatment phase further supports the motivational impact of Kahoot! on vocabulary learning. According to Deci and Ryan's (1985) Self-Determination Theory, students are more likely to perform better when they experience intrinsic motivation. The structured yet interactive nature of Kahoot! likely provided an optimal

balance of challenge and reward, fostering a sense of competence and motivation among learners. Additionally, the positive effects of Kahoot! can be explained by self-determination theory (Deci & Ryan, 2000), which states that people learn better when they feel motivated and in control of their learning. The use of Kahoot! in class gives students a sense of achievement when they see their scores improve. The leaderboard feature encourages friendly competition, and students become excited to participate.

Moreover, the results of this study support earlier research on the benefits of using games in education. According to Hartono et al. (2022), Kahoot! helps create an interactive learning environment that makes students more active and motivated in class. The improvement in students' vocabulary scores after using Kahoot! shows that learning with games can help students remember words better. The fun and competitive features of Kahoot!, such as answering questions quickly and earning points, keep students interested. In class, the teacher used Kahoot! quizzes to review vocabulary from previous lessons, allowing students to work in teams to discuss answers before choosing the correct one. This process facilitated collaborative learning and knowledge retention, reinforcing the effectiveness of game-based learning.

Additionally, the findings reveal a slight increase in the standard deviation from 20.14 in the pre-test to 21.30 in the post-test, suggesting some variation in individual performance. While the mean score improvement demonstrates overall effectiveness, the increased dispersion may indicate differing levels of adaptability or engagement among students. This aligns with Vygotsky's (1978) Zone of Proximal Development (ZPD), which suggests that students benefit differently from instructional scaffolding based on their individual learning capacities. Some students may have required additional support or reinforcement beyond the gamified quizzes to achieve significant gains.

Furthermore, Kahoot! is effective in vocabulary learning because it helps students focus without feeling overwhelmed. This idea is related to cognitive load theory (Sweller, 1988), which posits that learning is more effective when information is presented in a simple and clear manner. Kahoot! presents vocabulary in short, engaging quizzes with colorful visuals and instant feedback. For instance, the teacher created a Kahoot! game where students had to match words with pictures or complete sentences with the correct vocabulary. Since students saw the correct answers immediately, they could learn from their mistakes and remember words more easily. By using games like Kahoot!, teachers can make learning less stressful and more enjoyable for students.

The normality and homogeneity tests confirmed the suitability of the data for further statistical analysis, ensuring the reliability of the paired sample t-test results. The significance value of 0.000 in the paired sample t-test provided strong evidence that the observed improvement was not due to chance. This finding aligns with previous studies highlighting the benefits of digital game-based learning in language acquisition (Plump & LaRosa, 2017). The significance value of the two-tailed paired sample t-test was smaller than 0.05, which indicates that the null hypothesis (H0) is rejected and the alternative hypothesis (H1) is accepted. According to the alternative hypothesis (H1), there is an improvement in students' vocabulary after using the Kahoot! application. By comparing the mean score of the pre-test and the mean score of the post-test, the effectiveness of Kahoot! in teaching vocabulary can be verified. The mean score of the class significantly increased from 72.50 before the treatment to 79.17 after the treatment, indicating that using Kahoot! in teaching vocabulary was effective for the 6th-grade students of SD Negeri Penggarutan 01 Brebes.

Despite the positive results, some limitations should be acknowledged. The study focused on a single class, and individual differences in learning styles and prior vocabulary knowledge may have influenced the results. Future research could explore the long-term effects of Kahoot! on vocabulary retention and compare its effectiveness with other digital learning tools. Another limitation was the relatively short duration of the intervention, which may not fully capture long-term vocabulary retention. Extending the study period and incorporating follow-up assessments could provide deeper insights into the sustained impact of Kahoot! on language learning. Furthermore, as this study focused on a specific grade level, future research could examine its effectiveness across different age groups and educational settings.

Another area worth exploring is how Kahoot! compares to other game-based learning applications. While this study highlighted the effectiveness of Kahoot!, different gamified learning tools may yield varying results based on their features and implementation. Comparative studies could analyze different platforms to identify the most effective digital strategies for vocabulary acquisition. Additionally, incorporating qualitative data such as student interviews or surveys could provide a more comprehensive understanding of students' experiences and perceptions of Kahoot! as a learning tool.

In conclusion, the results of this study support the use of Kahoot! as an effective tool for enhancing vocabulary mastery in an engaging and interactive manner. The significant improvement in students' scores suggests that game-based learning can serve as a valuable supplement to traditional instructional methods, reinforcing vocabulary acquisition through motivation, participation, and self-directed learning. Future studies should continue to explore how game-based learning can be integrated into diverse educational contexts, ensuring that digital tools like Kahoot! maximize their potential in fostering effective and enjoyable learning experiences.

CONCLUSION

This study provides strong evidence that the use of Kahoot! as a digital game-based learning tool significantly enhances students' vocabulary mastery. The increase in students' mean scores from pre-test to post-test demonstrates the effectiveness of this interactive approach in improving vocabulary acquisition by fostering motivation, engagement, and a competitive yet enjoyable learning environment. Kahoot! aligns with key educational theories such as Self-Determination Theory, Active Learning, and the Zone of Proximal Development, reinforcing vocabulary retention and serving as a valuable supplement to traditional instructional methods. While the findings indicate overall effectiveness, variations in individual performance highlight the need for differentiated instructional strategies to support diverse learning needs. Despite the positive outcomes, limitations such as the study's focus on a single class and short intervention period should be acknowledged, and future research should explore long-term retention effects, comparative efficacy with other digital tools, and broader applicability across various educational settings. In conclusion, integrating Kahoot! into language learning curricula can enhance student engagement, foster motivation, and facilitate better learning outcomes, making game-based learning a promising approach for vocabulary development in diverse educational contexts.

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