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GAMIFYING VOCABULARY LEARNING: THE EFFECTS ON STUDENTS' ACQUISITION

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abstract

Vocabulary acquisition is a critical aspect of language learning, yet traditional teaching methods often fail to engage students. Game-based learning (GBL), particularly using platforms like Kahoot, has emerged as a promising approach to address these challenges by fostering an engaging and interactive learning environment. This study aims to investigate the effectiveness of GBL, specifically using Kahoot games, in improving vocabulary acquisition and enhancing student engagement among 7th-grade students. A mixed-method approach was employed, combining quantitative analysis of pre-test and post-test scores with qualitative insights gathered from student interviews and classroom observations. With a mean difference of 26.00, t = -17.085, and p = 0.000, the paired sample t-test findings indicate a significant increase in post-test scores compared to pre-test scores. Additionally, the mean N-Gain score is 0.9150. The study suggests that integrating educational games like Kahoot into the classroom can effectively enhance vocabulary acquisition and create an engaging learning environment. This finding highlights the potential implementing of Game-Based Learning using Kahoot games in alignment with current conditions, with opportunities for further optimization in the future.

INTRODUCTION

Vocabulary acquisition plays a critical role in mastering a language. As Nation, referenced in Al Qahtani (2015), emphasizes, vocabulary serves as a cornerstone of language proficiency, enabling learners to excel in listening, speaking, reading, and writing. A strong vocabulary foundation supports successful academic performance, clear communication, and improved comprehension. Despite its significance, many students face challenges in acquiring and retaining vocabulary, particularly in English as a foreign language (EFL) settings. Traditional methods, such as rote memorization and teacher-centered approaches, often fail to engage students effectively, leading to low motivation and limited retention (Zhang et al., 2016; Muminjon, 2023).

In response to these challenges, the integration of digital tools and multimodal learning approaches has emerged as a trend in foreign language education. Digitalization provides opportunities to create more interactive, engaging, and personalized learning experiences. According to Wang and Tahir (2020), there are several approaches to making learning more interactive, including dividing classes into small groups, using simulations and role-playing, using videos, audio-visual aids, and using effective presentation skills. Wahyuni & Dewi (2024) state that visual clues can improve spoken language comprehension and memory. Plass et al. (2015), as cited in Zusho (2014), stated that game-based learning is an advance in learning technology; well-designed video games can serve as effective learning tools because they

motivate and engage players, enabling them to learn subconsciously. Maulida et al. (2022) discuss the approach to game-based learning, which has proven to be an effective method to improve various aspects of education, including language learning. Mofareh Al Qahtani (2015) noted that according to Nation, vocabulary serves as a crucial component of language proficiency, that enables students to engage effectively in listening, speaking, reading, and writing activities. Zhang et al. (2016) noted that conventional vocabulary teaching methods often struggle to maintain student engagement and motivation, especially among younger learners.

Additionally, research by Ramachandra et al. (2011) highlights that relationship between nonword repetition and vocabulary acquisition appears to shift with age. While early studies of Gathercole in Ramachandra et al. (2011) suggest a strong connection between nonword repetition ability interpreted as a measure of short-term phonological memory and vocabulary learning, this association weakens beyond the age of five. At this stage, vocabulary knowledge itself becomes a stronger predictor of nonword repetition performance. These findings highlight the complex interplay between phonological memory and vocabulary development, Gathercole suggesting that their relationship is dynamic and age-dependent in Ramachandra et al. (2011). Mofareh Al Qahtani (2015) referenced nation's findings, which vocabulary acquisition is essential for learning languages, especially English, as it provides a foundation for successful academic performance, clear communication, and easier understanding. Despite its significance, many students find it difficult to acquire and retain the language because the traditional, teacher-centered approach does not effectively pique their interest as noted by Muminjon (2023). This difficulty emphasizes the need for new vocabulary teaching methods that actively involve students in the process while also increasing retention.

Game-Based Learning (GBL) has been shown to be beneficial in improving students' vocabulary acquisition and improving educational outcomes, according to substantial research bodies, especially when it comes to Kahoot-Based Learning games. The basis for understanding how Game Based-Learning can successfully combine interactive game dynamics with instructional content to improve the effectiveness of acquisition vocabulary is proposed by Nuraini et al. (2021). According to Plass et al. (2015) game-based learning (GBL) is a cutting-edge teaching method that combines instructional resources with game components to produce an engaging and captivating learning environment, this approach has attracted a lot of attention lately, with several studies that have shown its efficacy. Sartika et al. (2022) stated that education-based games are very helpful in fostering positive character traits in students, students who have a strong interest in game learning methods and play activities at school serve as a learning process that is considered very effective.

Mubaslat (2012) argues that although games are generally seen as fun activities for students, it is more important to recognize their educational significance, especially in the context of teaching a second language, especially in English. Games are very popular among children and can foster an interesting and fun learning atmosphere (Alotaibi, 2024; Ningsih, 2023). It has many benefits, including increasing student motivation, improving the learning process and performance to students, and providing a positive perception of learning in the classroom, it can be said that all students enjoy playing games because the games look entertaining and interesting to them. For instance Maulida et al. (2022) showed that game-based learning not only improves academic performance but can also improve more significant cognitive skills, such as critical thinking and decision-making to students.

Integration of digital media tools like Kahoot! into Game-Based Learning (GBL) has been shown to improve students' vocabulary aqcuision and facilitate effective learning outcomes in English language learning. According to Bhuana (2023) Kahoot! Functioning as a powerful

game-based learning platform and allowing educators to manage question-based assessments interactively, it is hoped that teachers can create multiple-choice tests that can be accessed through web and mobile applications easily. This accessibility allows for a wider reach, especially among young learners who are familiar with digital interfaces. Hasanah Lutfi (2022) added that with the use of interactive platforms such as Kahoot, it is hoped that students can learn vocabulary through the challenges and quizzes given, this can certainly encourage students' ability to understand English. Furthermore, Setiawan and Phillipson (2019) emphasized that game-based learning shifts the focus of students who are considered more difficult in the form of memorization to experiential learning, where students engage with the material in an easier way. This approach effectively transforms the educational experience into a fun experience while still educating students, it is hoped that students can interact with the content dynamically. Collectively, the study highlights the potential of tools like Kahoot! To enrich the game-based learning experience, it shows that the merger of the platform can increase interest and improve learning outcomes for students.

Furthermore, Ningsih (2023) highlights that game-based learning not only provides significant benefits but also makes learning enjoyable. However, the potential for exploring diverse types and methods of game-based learning in English vocabulary acquisition remains vast, necessitating further research to identify the most effective game types. Similarly, Wang and Tahir (2020) point out significant variations in the approaches and methodologies employed in game-based learning research, which complicates the ability to draw consistent conclusions about its overall effectiveness. Setiawan and Phillipson (2019) found that game-based learning has a more pronounced impact at the junior high school level compared to elementary school. However, there is a lack of in-depth studies examining the differences in effectiveness across various educational levels. Furthermore, Ergul and Dogan (2022) emphasize the need for more standardized research designs to enable meaningful comparisons between studies. Yundayani (2019) also notes that existing research fails to provide comprehensive insights into the specific types of games that yield optimal educational outcomes for diverse learning objectives.

Anastasiadis et al. (2018) found that game-based learning supports the development of critical thinking, decision-making, and problem-solving skills, which are increasingly vital in social contexts, alongside enhancing academic performance. Similarly, Pivec and Dziabenko (2004) highlight the growing role of technology in education and its potential to create engaging and interactive learning experiences through game-based methods, emphasizing the importance of adapting to technological advancements for lifelong learning. Hidayah and Widiastuty (2024) demonstrate that game-based learning not only improves students' vocabulary acquisition but also significantly boosts their motivation and engagement both in and beyond the classroom. Dwirahmita (2020) underscores the benefits of game-based learning, such as increased motivation and knowledge retention, while also addressing future challenges, including the need for diverse game options and inclusive approaches for varied student groups. Furthermore, Purba and Katemba (2022) suggest that game-based learning can be effectively implemented across different educational contexts by leveraging students' technological skills and local preferences to enhance vocabulary acquisition.

However, despite extensive research highlighting the benefits of game-based learning (GBL) in enhancing students' vocabulary acquisition, several gaps remain. Previous studies, such as those by Maulida et al. (2022) and Ningsih (2023), emphasize the positive effects of GBL on language learning, including increased motivation, engagement, and academic performance. However, most research focuses on general language skills, overlooking vocabulary-specific acquisition. Additionally, studies like Setiawan and Phillipson (2019) and Ergul and Dogan

(2022) highlight the need for more standardized research designs to facilitate comparisons across different educational levels. While research by Bhuana (2023) explored digital tools such as Kahoot! in GBL, there is limited empirical evidence on how specific game types impact vocabulary learning outcomes. Moreover, prior research has often concentrated on younger learners or university students, leaving a research gap in examining the impact of GBL on junior high school students, particularly in Grade 7. Additionally, the integration of technological platforms with traditional teaching methods remains underexplored in this context. To address these gaps, the current study investigates how game-based learning affects vocabulary acquisition among Grade 7 junior high school students. Therefore, the research question guiding this study is, "How is the effect of game-based learning on students' vocabulary acquisition?"

METHOD

Research Design

This study employed a sequential explanatory design, integrating quantitative and qualitative research methods to comprehensively examine the impact of game-based learning (GBL) on vocabulary acquisition among Grade 7 students. The sequential mixed-methods approach began with a quantitative phase to collect baseline data, followed by a qualitative phase to validate and deepen the understanding of the quantitative findings. This study follows the One-Group Pretest-Posttest Research Design steps (Rukminingsih et al., 2020). The process begins with selecting subject groups to serve as the research sample. A pre-test is then conducted to assess the participants' baseline performance. Following this, the intervention or treatment is provided to the participants. After the intervention, a post-test is administered to evaluate any changes in performance. The average scores and standard deviations from both the pre-test and post-test are calculated and compared. Finally, differences in means or data are analyzed to determine the effectiveness of the intervention.

Participants

The participants of this study consisted of 20 students from grade 7 of a state junior high school in Batam. The selection of participants was carried out using the cluster random sampling method with a random selection method of one class among several grade 7 classes, all participants were between 12 and 13 years old, with representation of male and female students. Prior to the intervention, the participants' English proficiency levels were assessed to provide a baseline for understanding their capabilities. The English proficiency of participants was assessed using the existing proficiency test administered by the school. This test evaluates vocabulary, grammar, and reading comprehension skills and aligns with the Grade 7 curriculum. The test results were analyzed to categorize participants into proficiency levels (e.g., beginner, intermediate, advanced), which were included in the demographic information table to provide a more detailed description of the sample population. Table 1 shows the demographic information of the participants.

Table 1. Demographic information of the participants

Category	Details	Frequency (n)	Percentage (%)
Gender	Male	10	50%
	Female	10	50%
Age	12 years	12	60%
	13 years	8	40%
English proficiency	Beginner	14	70%
	Intermediate	6	30%

Research Instruments

The research utilized two instruments: a vocabulary test and a semi-structured interview. A 50-item multiple-choice vocabulary test was administered to participants as both a pre-test and post-test. This test assessed two key indicators: word meaning and word usage in context. The test topics included food-related vocabulary, tastes, and textures in English.

Before being distributed to the sample, the vocabulary test underwent validity and reliability testing with respondents outside the study sample. The item validity test results ranged from 0.452 to 0.604 ($p = 0.005$), indicating that all items were valid. Reliability was measured using Cronbach's Alpha, which yielded a value of 0.676 which demonstrated an acceptable level of internal consistency.

For qualitative data, semi-structured interviews were conducted with five purposefully selected students. The interviews explored their experiences learning vocabulary using Kahoot, their perceptions of its effectiveness, and the challenges they encountered during the activity. The interview guide comprised 10 questions, including topics such as, "What do you think about the use of Kahoot for learning vocabulary?" and "What difficulties did you face while using Kahoot for vocabulary practice?"

Procedure of the Intervention

In Table 2 showed that the implementation of Game-Based Learning (GBL) in Class VII.1, which serves as the experimental group, follows the five phases of the GBL model in its digital format, as outlined in table 2.

Table 2. Game-Based Learning Model

No	Learning Activities	Duration
1	**Opening Activities** Greeting students and introducing the session topic (e.g., "Food Vocabulary"). Brief discussion to activate prior knowledge (e.g., asking students to name their favorite foods). Explaining the objectives of the lesson	15 minutes
2	**Core Activities** divided into:	160 minutes
	Phase 1: *Selecting the game and introducing concepts* Introduce key vocabulary (e.g., names of foods, tastes, textures)	20 minutes
	Phase 2: *Explaining the game system and rules*	10 minutes
	Phase 3: *Playing the game* Engage students in the game to practice vocabulary: Use **Kahoot quizzes** where students answer vocabulary-based multiple-choice questions. Play **Charades or Pictionary**, where students act out or draw vocabulary words for others to guess.	100 minutes

	Conduct a **word scavenger hunt**, where students find objects or images that match the vocabulary.	
	Phase 4: *Summarizing knowledge* Discuss the words learned during the game and their meanings. Use the words in sample sentences or create a short story together as a class.	20 minutes
	Phase 5: *Reflecting on the activity* Ask students to share their thoughts on the game: What did they enjoy? What was challenging? Encourage students to set goals for using the new vocabulary in real-life contexts.	10 minutes
3	**Closing Activities** Summarize the session, reviewing key vocabulary learned. Provide positive feedback and homework	5 minutes
Total Duration		**180 minutes**

Data Analysis

The quantitative phase involved administering pre-tests and post-tests to evaluate students' vocabulary knowledge before and after the intervention, which incorporated Kahoot! games. The pre-test assessed students' initial vocabulary knowledge, while the post-test evaluated their acquisition following participation in GBL activities. The quantitative data analysis began by assessing descriptive statistics to summarize the data. Next, a normality test was conducted to determine whether the data were normally distributed. For normally distributed data, a paired sample t-test was employed to evaluate whether there was a significant difference between pre-test and post-test scores, indicating the effectiveness of the Game-Based Learning (GBL) intervention. For non-normal data, the Wilcoxon Signed Rank Test was applied as a nonparametric alternative.

Additionally, to measure the improvement in students' vocabulary acquisition, the normalized gain (N-Gain) was calculated. The N-Gain provides a measure of the increase in students' understanding and mastery of concepts following the intervention. The categories of improvement were determined using the Gain (g) interpretation outlined by Hake (1998), as presented in Table 3 below.

Table 3. Classification of N-gain

Range N-Gain	Classification
$g \geq 0.7$	High
$0.3 \leq g < 0.7$	Average
$g < 0.3$	Low

Following the quantitative phase, qualitative data were collected through semi-structured interviews with a purposively selected sample of five students. This phase explored students' experiences with the GBL intervention, their perceptions of its effectiveness, and any challenges they encountered. Thematic analysis (Braun & Clarke, 2006) was employed to systematically analyze the interview transcripts. The process began with the researcher carefully reading and re-reading the transcripts to become immersed in the data while taking initial notes on recurring ideas and observations (Braun & Clarke, 2006; Dewi et al., 2023). The transcripts were then coded using a combination of inductive and deductive approaches. Inductive codes emerged directly from the data, such as "challenges during gameplay" and

"engagement," while deductive codes were derived from the study's research objectives, such as "effectiveness of GBL." This coding process was facilitated using qualitative analysis software, *Atlas.ti*.

Next, the codes were grouped into broader categories to identify potential themes. For instance, codes like "fun learning experience" were clustered under the theme Engagement, while codes such as "difficult rules" were grouped under Challenges in GBL Implementation. The themes were then reviewed and refined to ensure they accurately reflected the data. This involved verifying the coherence of each theme within and across datasets and aligning them with the research questions. Redundant or overlapping themes were merged or adjusted during this stage.

Each theme was clearly defined to encapsulate its essence. For example, the theme "Engagement and Motivation" captured students' perceptions of GBL as enjoyable and motivating, while "Challenges in GBL Implementation" addressed the obstacles encountered during gameplay. Finally, the themes were supported by direct quotations from the interview transcripts, which provided rich and illustrative examples of students' experiences. These quotations were carefully selected to highlight the diversity and depth of the participants' responses, ensuring that the analysis remained grounded in the data.

FINDINGS AND DISCUSSION

Findings

The findings of this study were analyzed using both quantitative and qualitative methods. The quantitative analysis evaluated the effectiveness of Game-Based Learning (GBL) by comparing pre-test and post-test scores. The pre-test was conducted prior to the intervention, while the post-test was administered afterward. Descriptive statistics, including the mean and standard deviation for both tests, are presented in Table 4.

Table 4. Descriptive Statistics Data

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PRE TEST	71.0000	20	8.52242	1.90567
	POST TEST	97.0000	20	4.70162	1.05131

The results indicate that the mean pre-test score was 71.00 (SD = 8.522), while the mean post-test score increased significantly to 97.00 (SD = 4.702). This substantial improvement suggests that the GBL intervention positively impacted students' vocabulary acquisition. The increase in mean scores highlights the effectiveness of Game-Based Learning as an instructional method for enhancing vocabulary learning. The smaller standard deviation in the post-test scores (4.702 compared to 8.522 in the pre-test) suggests reduced variability in students' performance, indicating that the intervention was beneficial across the sample. These findings align with previous studies demonstrating the efficacy of interactive and game-based approaches in fostering student engagement and improving learning outcomes. The results support the integration of GBL as a supplementary tool for vocabulary acquisition, particularly in fostering active participation and motivation among learners.

To validate the statistical significance of these results, a paired-sample t-test was conducted. The analysis of paired sample t-tests comparing pre-test and post-test scores of students (N = 20) revealed significant improvement in vocabulary acquisition after implementing game-based learning using Kahoot. The mean score of the pre-test was 71.00 (± 8.52) while the post-test mean increased to 97.00 (± 4.70).

Table 7. Paired Samples Test

Statistic	Value
Mean Difference	-26.00
Standard Deviation	6.81
Standard Error Mean	1.52
95% Confidence Interval	-29.19 to -22.81
t-Value	-17.09
Degrees of Freedom (df)	19
Significance (p-value)	.000

A paired-sample t-test revealed a statistically significant increase in students' vocabulary scores following the intervention. The improvement was demonstrated by a mean difference of -26.00 ($t=-17.085$, $df=19$, $p<0.001$, $t = -17.085$, $df = 19$, $p < 0.001$, $t=-17.085$, $df=19$, $p<0.001$). These results indicate that the post-test scores were significantly higher than the pre-test scores, confirming that the Game-Based Learning (GBL) intervention had a substantial positive effect on vocabulary acquisition.

Next, the descriptive analysis of the N-Gain score and N-Gain percentage further highlights the distribution of learning improvements among the 20 students who participated in the study. Table 8 provides the statistical summary.

Table 8. Descriptive N-Gain Statitics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Ngain_score	20	.67	1.00	.9150	.13647
Ngain_Percent	20	66.67	100.00	91.5000	13.64654
Valid N (listwise)	20				

The average N-Gain score was 0.9150, which falls within the high category. This indicates that the majority of students experienced significant improvements in vocabulary acquisition following the GBL intervention. Additionally, the N-Gain percentage had a mean of 91.50%, further emphasizing the substantial learning gains achieved by students during the study. These findings strongly support the effectiveness of Game-Based Learning as an engaging and impactful instructional approach for enhancing vocabulary acquisition.

Meanwhile, the qualitative analysis revealed that students who used Kahoot! as a vocabulary learning tool reported higher levels of motivation and enjoyment compared to traditional learning techniques. Three main themes emerged from the thematic analysis.

Theme 1 Motivation and Engagement

One of the most prominent findings was that students felt more motivated and engaged when using Kahoot! for vocabulary learning as seen in the excerpt below:

"Yes, because using Kahoot makes vocabulary learning more fun."

This response highlights how the interactive and gamified nature of Kahoot! transformed what might otherwise be a monotonous task into an enjoyable experience. By associating learning with fun, students were more eager to participate and learn new words. Another interviewee stated:

"It was very exciting because the competition between students was very tight because they felt challenged by the questions that would appear."

The competitive element of Kahoot! fostered a sense of excitement and engagement among students. The anticipation of the next question and the drive to outperform peers created a dynamic learning environment where students felt energized and actively involved. This theme underscores how gamified learning can make vocabulary acquisition more engaging, thereby increasing students' intrinsic motivation to learn.

Theme 2: Effectiveness of Learning

Students also highlighted the effectiveness of Kahoot! in improving their vocabulary skills as seen in excerpt, *"It is very effective because the questions in Kahoot require me to think critically to answer them."* This comment reflects how Kahoot! encouraged higher-order thinking. The need to process vocabulary in context and select correct answers under time pressure challenged students to engage more deeply with the material, which likely enhanced retention. Another student stated, *"For beginners, it's very useful for learning new words."* Students with limited prior knowledge of vocabulary found Kahoot! particularly helpful. The platform provided a structured and interactive way to expand their lexicon, which may not be as easily achievable through traditional methods.

Theme 3: Challenges

Despite its many benefits, students reported certain challenges in using Kahoot! for vocabulary learning. Some excerpts below highlights the challenges the students faced during the learning process.

"The time to work on the questions was very short."

Time constraints emerged as a common issue, with many students feeling rushed to answer questions. This limitation may have hindered their ability to fully process the vocabulary and could potentially cause frustration for some learners.

Besides, technical difficulties, including unreliable internet connections, disrupted the flow of learning activities as mentioned by one student:

"The activities were periodically hampered by technical constraints, such as internet access problems."

These issues could reduce the overall effectiveness of the intervention, particularly in environments where technology infrastructure is inconsistent. This theme highlights that while Kahoot! has significant potential as a learning tool, practical challenges such as time management and technological reliability must be addressed to maximize its effectiveness.

Discussion

This study contributes to the growing body of research that underscores the effectiveness of game-based learning (GBL) tools, such as Kahoot, in improving vocabulary acquisition among seventh-grade students in the context of English language education. Vocabulary, as highlighted by Nation (as cited in Al Qahtani, 2015), is a fundamental component of language proficiency, supporting success in listening, speaking, reading, and writing. Traditional vocabulary teaching methods, often based on rote memorization, have been criticized for failing to engage learners effectively (Zhang et al., 2016). This study aligns with such observations, demonstrating that integrating digital tools like Kahoot into GBL methodologies creates a dynamic, interactive learning environment that addresses these limitations.

Kahoot exemplifies the principles of effective GBL by combining game mechanics with instructional content to promote active learning and student engagement, as noted by Nuraini et al. (2021). The findings also support Plass et al.'s (2015) assertion that well-designed games provide immersive learning experiences, enabling students to acquire knowledge unconsciously through engaging gameplay. Kahoot's interactive quizzes and real-time challenges fostered critical thinking and decision-making skills, corroborating findings by Maulida et al. (2022).

Moreover, this study aligns with Bakan and Bakan's (2018) emphasis on tailoring teaching methods to suit learners' developmental stages. For junior high school students, who often struggle with maintaining focus and motivation, Kahoot offers an age-appropriate solution that leverages their familiarity with technology and preference for gamified learning environments (Setiawan & Phillipson, 2019). This finding also echoes Alotaibi (2024), who demonstrated that GBL methods significantly enhance student motivation and engagement, both during and beyond the classroom.

The gamified features of Kahoot, such as competition and real-time feedback, were particularly effective in boosting student motivation and engagement. Students described the platform as exciting and stimulating, findings consistent with Alotaibi (2024) and Ningsih (2023), who note that GBL tools create enjoyable and interactive classroom experiences. These results also align with Plass et al. (2015) and Sartika et al. (2022), who highlight the role of gamified environments in fostering intrinsic motivation by merging playfulness with educational goals.

The study further reveals that Kahoot effectively supports vocabulary acquisition, with students reporting a deeper understanding of words and an enhanced ability to think critically. This corroborates Maulida et al. (2022), who found that GBL enhances cognitive skills such as critical thinking and decision-making. Beginners especially benefited from Kahoot's structured yet engaging format, which facilitated vocabulary learning in an accessible way. This observation supports Nation's framework (as cited in Al Qahtani, 2015), emphasizing the importance of vocabulary in enabling language proficiency across domains.

Additionally, Setiawan and Phillipson (2019) highlight how GBL shifts the focus from rote memorization to experiential learning, an approach particularly effective for junior high school students navigating foundational stages of language acquisition. These findings collectively illustrate that Kahoot serves as an effective tool for enhancing both motivation and vocabulary acquisition, making it a valuable addition to the toolkit of modern language educators.

While Kahoot! offers numerous advantages, students identified certain challenges that can affect its effectiveness, particularly time constraints and technical issues. Many students reported that the time allocated for answering questions was insufficient, making the activity

more stressful than enjoyable. This observation is consistent with Ergul and Dogan's findings (as cited in Dahalan, 2022), which highlight that practical constraints, such as activity design and infrastructure limitations, can hinder the effectiveness of game-based learning (GBL).

Practical challenges, including disparities in access to technology and time constraints in educational settings, also deserve careful attention. Periodic technical difficulties, such as unreliable internet access, further emphasize the broader challenges of integrating digital tools into educational contexts. These challenges align with Selwyn's (2011) observations that the successful adoption of digital tools in education often depends on addressing systemic issues related to infrastructure and access. To maximize the potential of GBL tools like Kahoot!, it is crucial to prioritize accessibility and inclusivity, ensuring all learners can benefit regardless of their circumstances.

Ergul and Dogan (as cited in Dahalan, 2022) also emphasized the need for standardized research designs to facilitate cross-study comparisons and establish consistent conclusions about the efficacy of GBL tools. This standardization could help educators and researchers better understand the broader impacts of GBL across diverse contexts. Furthermore, as Ningsih (2023) suggests, expanding the exploration of different game types and their effects on various learning objectives could provide deeper insights into refining GBL applications for a wider range of educational needs.

The findings of this study offer significant theoretical and practical contributions to the field of education, particularly in game-based learning (GBL) and vocabulary acquisition. It advances the understanding of how GBL tools like Kahoot integrate gamification principles with cognitive engagement, demonstrating that such tools not only enhance motivation but also foster critical thinking and decision-making during vocabulary learning. This dual focus on engagement and cognitive development enriches existing theories of active learning and intrinsic motivation. Additionally, the research provides a unique perspective on age-specific pedagogical strategies by highlighting how GBL tools are particularly effective for adolescents. By taking advantage of their familiarity with technology and preference for interactive, competitive formats, Kahoot addresses common challenges in traditional learning, such as disengagement and rote memorization. Furthermore, this study extends Nation's framework of vocabulary acquisition by showcasing how gamified environments facilitate experiential and contextual learning, moving beyond mere memorization to foster deeper retention and application of vocabulary.

Practically, the study provides compelling evidence for the integration of Kahoot into vocabulary instruction. The detailed analysis of its gamified features, such as real-time feedback and competition, offers a practical guide for educators to design engaging and effective language-learning activities. Moreover, by identifying challenges like time constraints and technical difficulties, the study emphasizes the need for optimized GBL activity designs and infrastructure improvements to enhance accessibility and inclusivity, particularly in resource-limited settings.

CONCLUSION

In conclusion, this study demonstrates that game-based learning tools like Kahoot can significantly enhance vocabulary acquisition by addressing the limitations of traditional teaching methods. The findings reveal that Kahoot fosters a dynamic and interactive learning environment, promoting critical thinking, decision-making, and active engagement among

students. Additionally, the gamified elements, such as real-time feedback and competition, enhance motivation and make vocabulary learning enjoyable, especially for adolescent learners who benefit from age-appropriate and technology-driven approaches. However, challenges such as time constraints and technical difficulties highlight the need for thoughtful activity design and infrastructure improvements to ensure accessibility and inclusivity. These results underscore the value of integrating game-based learning with effective teaching practices to create an engaging educational experience that supports vocabulary acquisition and broader language learning goals. Future research should explore the application of game-based learning in diverse skill domains, age groups, and educational contexts to further unlock its potential for enhancing learning outcomes.

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