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DO KAHOOT! GAMES ENHANCE VOCABULARY LEARNING?

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Abstract/Izvleček Many educators are considering using online games for learning vocabulary. Among the existing online games is Kahoot. This study aimed to determine if male and female students learn vocabulary the same way using Kahoot! Games. The study examined whether there was any significant difference among the female and male groups in their vocabulary enhancement. This quantitative research study used a pre-test and a post-test administered to sixty-eight seventh-grade students. Findings revealed a significant difference in vocabulary enhancement between female and male students, thus supporting the use of Kahoot! games as an effective method for teaching vocabulary.

Keywords:
technology & Vocabulary, Male vs. Female, smartphone, EFL context

Raba orodja Kahoot za uspešno razvijanje tujejezikovnega besedišča

Številni učitelji razmišljajo o uporabi spletnih iger za učenje besedišča, med katerimi je še posebej pogosta aplikacija Kahoot. Osnovni namen pričujoče raziskave je bil ugotoviti, ali se z uporabo orodja Kahoot učenci in učenke v indonezijskem kontekstu učijo besedišča na enak način. Cilj je bil ugotoviti, ali pri razvijanju besedišča v tujem jeziku obstajajo statistično pomembne razlike med deklicami in dečki. Za ta namen smo izvedli kvantitativno raziskavo z 68 učenci 7. razreda, ki so reševali test pred in po uvedbi učenja z orodjem Kahoot. Rezultati kažejo, da med spoloma obstaja pomembna razlika pri uspešnem učenju besedišča z aplikacijo Kahoot in da je raba Kahoota učinkovita metoda za poučevanje besedišča.

Ključne besede:
tehnologija in besedišče, pametni telefon, angleščina kot tuji jezik

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Introducation

English is highly vital in this age of globalization. English is considered a foreign language in Indonesia but is a mandatory part of the school curriculum. Indonesian students usually face difficulties learning English, particularly vocabulary, because English differs from Indonesian in structure, pronunciation, and vocabulary (Katemba, 2019). It can be challenging for EFL learners to master vocabulary, and this condition has led them to lose interest in and motivation for learning English. Nation (2013) states that vocabulary is fundamental to language proficiency and development. Learning a language is impossible without a working vocabulary, and adequate communication with others is made impossible (Katemba, 2022).

Furthermore, vocabulary knowledge not only aids learners in enhancing their reading comprehension but also aids them in developing their writing and speaking abilities (Fitzgibbon, 2003). However, the effectiveness of a crucial skill, reading, may depend on vocabulary knowledge. It means that vocabulary has a crucial effect on the development of language learning, so, without vocabulary, we cannot do anything. Therefore, teaching strategies are crucial in making teaching and learning more effective. According to Thornbury (2002), one successful strategy for teaching language involves using games. Games help the teacher to maximize each student's learning potential (Sugar and Sugar, 2002). Another study, conducted by Taebenu and Katemba (2021), found that learning vocabulary through games is one of the practical and exciting methods that can be applied in any classroom. Moreover, to solve the challenge of students who have difficulty learning vocabulary in the EFL context, teachers should vary their methods for helping students to enhance their vocabulary knowledge.

During the COVID-19 pandemic, online games for language learning grew in popularity for teaching and learning English as a Foreign Language (EFL) (Katemba and Sinuhaji, 2021). One up-to-date method to teach vocabulary is through Kahoot! games. Kahoot! games are considered an effective method to enhance students' vocabulary knowledge. Mansur and Fadhilawati (2019) stated in their study that students' positive attitude regarding the usage of Kahoot! in teaching and learning contributed to an improvement in student accomplishment. Using Kahoot! games can benefit both teachers and students because the latter will enjoy learning the foreign language without stress; therefore, vocabulary acquisition would be facilitated.

It was also found that using technology-based games for vocabulary instruction increased student vocabulary assessment scores, while also increasing student focus and on-task behavior (Abrams and Walsh, 2014; Berliani and Katemba, 2021). Moreover, the student satisfaction survey indicated that students enjoyed playing Kahoot! and found it easy to use. Katemba (2021) found that learning vocabulary through mobile games is effective in helping students to improve their vocabulary-building skills. In recent years, computer technology has become widely used for education and has proven helpful in teaching vocabulary. For example, a study of the effect of digital games on children's vocabulary retention in foreign language acquisition among Iranian students established the positive effect of using digital games in teaching English vocabulary to children (Aghlara and Tamjid, 2011).

Moreover, a classroom study using Kahoot! by Baszuk and Heath (2020) claimed that with a trivia game, students can gain a better understanding of vocabulary, and the principles of the course, while receiving immediate feedback. Kahoot! is a popular e-Learning tool that can add vitality and metacognitive support to higher education classrooms with limited instructor or student training (Plump and LaRosa, 2017). Interesting research has been conducted among rural students, and results indicated that using Kahoot! can enhance learning motivation, gain student attention, and create incentives for students to preview and review learning materials while promoting learning efficiency (Lee et al. 2019). Another finding showed that Kahoot! boosted student engagement, motivation and learning after five months of regular use (Wang, 2015). However, there is a gap in the previous studies because none of the studies explores the relation between vocabulary enhancement among females and males by using Kahoot! Therefore, this study aims to fill the gap. Nowadays, many teachers use computers and the internet in their classrooms, especially during the pandemic. It has been established that technology helps in teaching vocabulary (Ahmad et al., 2017; Katemba, 2019; Lai and Chun, 2017; Mahdi, 2018; Niitemaa, 2018; Taj, Ali, and Ahmad, 2017). The current study aims to compare the use of Kahoot! games by female and male students, to establish any significant difference in vocabulary improvement. Therefore, our study seeks answers to these questions: (1) What is the level of student achievement in the female and male groups? (2) Is there any significant difference in students' vocabulary enhancement between female and male groups after instruction with Kahoot!? Finally (3), what is the student response to Kahoot!?

Literature review

The literature review examines the importance of vocabulary and the use of Kahoot! games in enhancing vocabulary among grade seven students.

The importance of vocabulary

Why is vocabulary considered necessary? Nation (2002) describes the relationship between vocabulary knowledge and language use as complementary: knowledge of vocabulary enables language use and, conversely, language use increases vocabulary knowledge. That is why students interact readily with others when they have a rich vocabulary. According to Robinson (2001), vocabulary forms the basis of your capacity to think and to share your opinions with other people. So, EFL teachers should know students' ability to comprehend words because vocabulary is the key to learning a language. According to Erkaya and Drower (2012), mastering vocabulary is one of the most critical aspects of learning a language. In addition, digital games often provide the motivation necessary to learn (Paul, 2011).

Nevertheless, very few educational games have been accepted into the curriculum. Many have been developed by teachers with limited funding and technical skills, and often do not captivate students. Clark (2004) maintains that commercial game designers are successful because they focus only on engaging the player and making the game fun. Researchers use Kahoot! as a sample of technology to learn vocabulary. Kahoot! is a tool for using technology. It is a game-based classroom response system played by the whole class in real-time. Multiple-choice questions are projected on the screen. Students answer the questions with their smartphones, tablet, or computer.

Using Kahoot! games is one solution for enhancing students' vocabulary. According to Paul (2011) and Medina and Hurtado (2017), digital games are often seen to provide and increase the motivation necessary to learn. Moreover, Kahoot! games bring considerable interaction to the classroom. As a result, students enjoy playing Kahoot! in class and find it easy to use. Besides, such games are used not only for fun but, more importantly, for helpful practice and review of language lessons, thus leading toward the goal of improving learners' acquisition of vocabulary and communicative competence, while fostering students' English performance (Ching-Huei and Hui-Chin, 2019; Medina and Hurtado (2017).

Similar findings by Licorish, Owen, Daniel, and George (2018) in their study titled "Students' perception of Kahoot!'s influence on teaching and learning" prove Kahoot! can improve the quality of student learning in the classroom. Moreover, a study by Halise (2018) called "Implementation of the digital assessment tool Kahoot! in Elementary School" indicated that students found Kahoot! enjoyable, informative, helpful and acceptable, even perfect. Furthermore, Wang and Tahir (2020) found in their research that Kahoot! could positively affect classroom dynamics, learning achievement, students' and teachers' attitudes, and student anxiety. In other words, when Kahoot! is used for teaching, students are more eager to attend class, they pay more attention to English, and that is why their learning achievement increases and they become interested in learning more about what they have learned and want to tell others about it. Key findings revealed that Kahoot! enriched the quality of student learning in the classroom, with the highest influence reported on classroom dynamics. Kathryn (2017), in her study "The effects of Kahoot! on vocabulary acquisition and retention of students with learning disabilities and other health impairments," indicates that using a game-based learning platform may lead to an increase in vocabulary acquisition, retention, engagement, motivation and an improved learning experience (Licorish, Owen, Daniel, and George, 2018).

Therefore, the research hypothesis is examined through an experiment using Kahoot! games by females and males, and the statistical studies are hypothesized as follows:

Ho: There is no significant difference between males and females in vocabulary enhancement through Kahoot! games learning.

Methodology

Research Design

This research involves a quantitative study. The design uses a pre-test and a post-test. The researcher uses this method to establish students' vocabulary levels before and after instruction. The research design is shown in Table 1

Table 1. Research Design

GROUP	PRE-TEST	Kahoot games	POST-TEST
1	O	X1	O
2	O	X2	O

Explanation: X1: Learning English by Kahoot! games in females, X2: Learning English by Kahoot! games in males. O: Pre-test and Post-test

The Population and Sample

The population of this study was students of grade VII in Cimahi. The research employed two classes as the experimental population. The sample comprises grades VII E and VII F, amounting to sixty-nine students. Grade VII E has thirty-four students, while grade VII F has thirty-five students. Both classes received the same treatment and the same strategies. The researcher randomly selected both intact groups. They come from the same cultural background and are 12 to 14 years old. In terms of L2 proficiency, the students are at the beginner level of EFL. All the students took the pre-test before the class to establish their level at the beginning of the program.

Research Instrument

In this study, the researcher uses a vocabulary test comprising fifty questions as a pilot test on grade VII students in Cimahi. The pilot vocabulary test aimed to establish validity and reliability for the pre-test and post-test designed to measure student ability in vocabulary before applying the Kahoot! games to female and male students. The post-test is designed to see the results of the study after the game instruction. The Kahoot! application game was used through smartphone, tablet, or computer, with an internet Wi-Fi/ hotspot in the classroom to access the Kahoot! games. The students were given a questionnaire at the end of the program to get their responses regarding the method used.

Data Collection

To measure the level of students' vocabulary enhancement, there was a pre-test before the game app was applied in the class of seventh-grade students at Cimahi. This was conducted to find the initial situation and identify any problems.

The experiment was conducted in two groups using the same strategy: one class used Kahoot! games in the female group and the second in the male group. After the experiment had been conducted for both classes, the groups took an achievement test at the end of the session. The post-test questions came from their grade 7 books to establish whether the techniques could improve their vocabulary. Thus, data was gathered by administering pre-test and post-tests to the seventh-grade students. In collecting the data, several procedures were used:

1. Conducting a Pilot Test

The researcher conducted a pilot test to measure the instrument's validity, reliability, level of difficulty, and discrimination index. There are fifty questions in this test. The test was given to grade VII students from another section of the school, to students who were not participating in the main study. The fifty questions were multiple-choice. After collecting the data, the researcher analyzed the data with the statistical software program (SPSS- statistical program for the social sciences).

2. Conducting the Pre-test

A pre-test was conducted to determine the students' vocabulary level before the experiment. Thirty valid, reliable, and significant questions were used for the pre-test and administered to both groups. In this study, the pre-test measured the students' previous vocabulary knowledge in both experimental groups before the app game instruction.

3. The experimental group

In this study, both groups were given kahoot games. The material taught for both class was the same for both groups.

After administering the pre-test, the experiment was conducted with the students. Some material was taken from the school textbook and other material from the internet, and the researcher used Kahoot! games. These are the steps in playing: 1) First, the teacher greets the students and asks how they are doing; 2) The teacher explains to the students about Kahoot! 3) To play online, the students use a gadget and respond to questions displayed to the class on a projector in front of the class. Students played the online Kahoot! game regularly throughout the week; 4) The researcher teaches the female and male groups; 5) Students were assessed on their vocabulary acquisition weekly via vocabulary activity.

4. Conducting the Post-test

The purpose of the post-test is to establish the students' degree of improvement after using the Kahoot! games, and to determine whether there were any significant differences in improvement levels between the female and male groups.

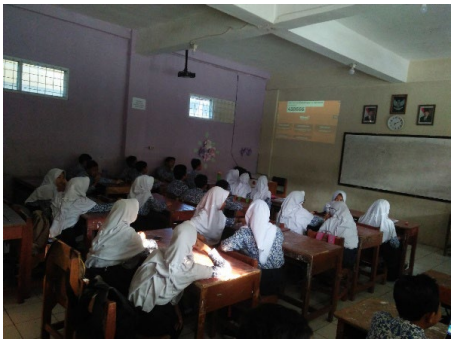

Figure.1. During the class time. Grade VII-E

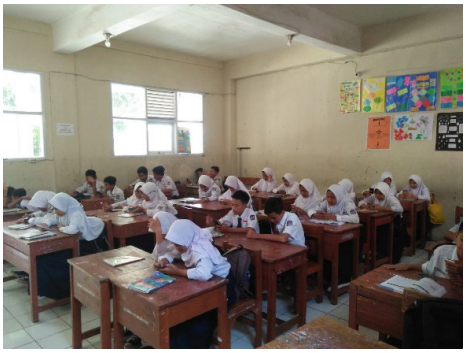

Figure. 2 During the class time. Grade VII-F

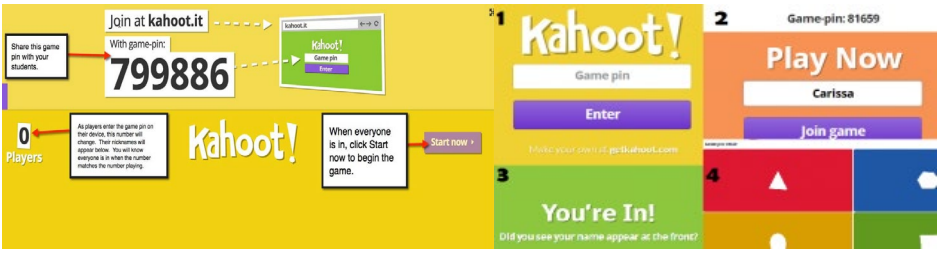

Figure. 3. Example of Kahoot! games

Data Analysis and Findings

This section contains the results of data analysis from 32 hours of research at Cimahi. The researcher used Microsoft Excel and Statistical Program (SPSS) to analyze the data. The results of the pre-test, post-test, Standard Deviation, and Normalized gain of each group are shown in Table 2.

Table 2. Pre-Test, Post Test, Standard Deviation, and Normalized Gain

	Female		Male	
	Mean	**St. Deviation**	**Mean**	**St. Deviation**
Pre-Test	77.00	8.060	72.03	6.994
Post Test	92.06	5.622	90.69	6.096
Normalized Gain	0.5410	0.1860	0.6731	0.1900

From Table 2, the mean pre-test for the Female group is 77.00 with a standard deviation (SD) of 8.060 and the post-test 92.06 with an SD of 5.622. For the male group, the mean for the pre-test is 72.03 with an SD of 6.994, and for the post-test, 90.69 with an SD of 6.096. Based on the improvement in SD from the normalized gain of both groups, it can be concluded that there is an improvement in students' vocabulary. The data from Table 2 show that the male group has a higher gain score after the experiment (0.6731) compared to that of the female group (0.5410).

Test of Normality

The normality test was conducted for the data obtained in the pre-test. After establishing normality, the researcher did the homogeneity test to find whether the populations were homogenous or not. The normality test result for the Pre-test score is shown in Table 3.

Table 3: The Normality Test Result for Pre-test Score

Group	**Shapiro-Wilk**		
	Statistic	**Df**	**Sig.**
Female	.976	32	.689
Male	.969	35	.408

Based on these results, the data for both groups is normally distributed, where the significant value for the female group is $0.689 > \alpha$ (0.05), and the significant value for the male group is $0.408 > 0.05$.

Since both data sets are normally distributed, the data based on the mean row is considered for the homogeneity test.

Test of Homogeneity of Variance

A homogeneity test was done to establish the homogeneity of the sample variances. Results of the homogeneity test can be seen in Table 4.

Table 4: The Homogeneity Test Result for Pre-test Score

Levene Statistic	df1	df2	Sig.
.612	1	65	.437

Based on the data, the significant value is 0.437 > α (0.05), meaning the population variance is homogeneous.

Independent Sample Test

Since the data is homogeneous, an independent sample t-test was conducted, which is given below. The Independent Sample t-test Result for the Pre-test Score is shown in Table 5.

Table 5. The Independent Sample T-test Result for Pre-test Score

		Levene's				
		F	**Sig.**	**T**	**Df**	**Sig. (2-tailed)**
Female_Male	Equal variances assumed	.612	.437	2.702	65	.009

The data in Table 5 show that the ρ-value = 0.009 < α (0.05), which means that Ho (null hypothesis) is rejected. Therefore, we can conclude that there is a significant difference in student's vocabulary enrichment between females and males after instruction with Kahoot! After conducting the pre-test, the researcher applied the experimental instruction, and at the end of the session, there was a post-test to measure any improvement in the students' vocabulary. Subsequently, both groups' pre-test and post-test scores were calculated using the Normalized Gain formula.

Test of Normality

The researcher conducted a normality test for the result of the gain score. The Normality Test Result for Normalized Gain Score is shown in Table 6.

Table 6. The Normality Test Result for Normalized Gain Score

Group	Shapiro-Wilk		
	Statistic	**Df**	**Sig.**
Female	.983	32	.875
Male	.960	35	.222

Based on this data, it can be concluded that the data sample is normally distributed for both groups with the same significant value, which is 0.222 > α (0.05).

Since the data are normally distributed, the homogeneity test should be considered from the data based on the mean row.

Test of Homogeneity of Variance

A homogeneity test was done for the sample variance. The homogeneity result for the normalized gain score is shown in Table 7.

Table 7. The Homogeneity Result for Normalized Gain Score

Levene Statistic	**df1**	**df2**	**Sig.**
.007	1	65	.932

According to the data above, the significant value is 0.932 > α (0.05), meaning the sample variances are homogenous, and we can proceed to test the gain score by using the Independent Sample t-test of gain score.

Independent Sample T-test of Gain score

As is apparent in Table 7 above, the result of the data was homogenous; therefore, the researcher used the independent sample t-test of the gain score.

Table 8. Independent Sample T-test of Gain score

		Levene's				
		F	**Sig.**	**T**	**Df**	**Sig. (2-tailed)**
Female_Male	Equal variances assumed	.007	.932	-2.872	65	.006

The findings in Table 8 show that ρ-value = 0.006 < α (0.05). It is concluded that there is a significant difference in the student's vocabulary improvement between females and males after instruction using Kahoot! This provides an answer to the research question.

Student's Evaluative Response

Additional data required for the study were collected by administering a questionnaire to the subjects to assess their response to Kahoot! games. The results appear in the table below:

Table 9. The percentage for Student's Evaluative Response

Criteria of Response	Percentage of Student Response
Positive	33.92%
Moderate	60.71%
Negative	5.35%

It was found that 33.92% of the participants had positive responses to Kahoot! games, 60.71% were moderate, and 5.35% of participants had a negative response to the implementation of Kahoot! games.

Discussion of Research Findings

The results showed a significant male-female difference in students' vocabulary enhancement through Kahoot! games. From the normalized gain, we can see that the female students scored 0.5410 and male students 0.6731. So, Kahoot! games are more applicable in the male group. According to the researcher's experience in the field, the students in the female group were more interested in and enthusiastic about the Kahoot! games. On the other hand, students who played in the male group tended to be noisier and not as excited by the Kahoot! games. However, almost all the students aimed to master playing the online games to achieve their goals; for example, the researcher assigned one theme per class as an attainable goal: animals, objects, or occupations. They had various difficulties when playing Kahoot! games, but they persevered and finished the game. The researcher also offered assistance if students asked about the use of the games or how to log in. In their study, Holbrey (2020) and Zarzycka-Piskorz, (2016) found that gaming was effective in facilitating active player engagement and continuous interactive learning while building concentration and retention as well as motivation to both win and learn.

McKee (2014), on the website titled *The Vocab Games: Kahoot!,* explained that studying with Kahoot! had the following effects: 1. Players begged to play it again; 2. Fun music and bright colors made the whole experience fun; 3. The music becomes increasingly suspenseful as time begins to run out. Returning to the hypotheses in the introduction, we can address the following questions: 1. What is the student's achievement in class? 2. Is there any significant difference in students' vocabulary enhancement between females and males after instruction with Kahoot!? 3. What are the students' responses to Kahoot!?

To answer the first question:. Students in Cimahi achieved higher scores after having worked with the program. The male gain score was 0.6731, higher than the female gain score, which was 0.541. This is because the male group size is bigger than the female group. For instance, the result of the t-test was used to answer research question two. The score of the t-test was 0.009, meaning there is a significant difference between females and males in Kahoot! games. In using these games in the classroom, Göksün and Gürsoy (2019) found a positive effect on academic achievement and student engagement in learning. Moreover, the questionnaire data indicated that 33.92% of participants responded positively to playing Kahoot! games, and 60.71% were moderate in their response, while only 5.35% had a negative response to Kahoot! games. Most of the students (94.63%) agreed with the implementation of Kahoot! games to improve their vocabulary. This is a similar finding to that of Fernández-Vega et al. (2020); their survey showed that students were very receptive to this teaching modality and that Kahoot! encourages attention and assimilation of concepts, as well as being highly valued by students.

Based on the above, the researcher recommends using Kahoot! games because this can improve vocabulary acquisition. The researcher therefore recommends this method to future researchers in Southeast Asia, Asia, and other EFL countries. Hopefully, this method can work effectively and help teachers and future teachers consider this in solving the problem of learning vocabulary because it has proven to engage students while motivating them to learn their lesson and enjoy the method.

Conclusion

Overall, the use of the Kahoot! application proved beneficial in maintaining and developing learner engagement while enhancing learners' vocabulary in this study. From the data analysis on the pre-test and post-test, the researcher concluded that there was a significant difference between females and males. In this study, the male group had a higher gain score compared to the females. However, in both groups, students had positive attitudes towards Kahoot! being used in the classroom because it was fun and led them to enjoy the lessons. In addition, they experienced a significant vocabulary enhancement with the use of the Kahoot! application.

Recommendations

Based on the research findings, the researcher makes several recommendations:

1. *For Teachers*: It is recommended that teachers use these methods as an alternative in teaching English vocabulary, especially for grades seven and above, because they have been proven by the researcher, with results showing that the student's vocabulary significantly increased.
2. *For students:* It is recommended that students learn English vocabulary using these methods because they are exciting and already proven by students taught through these methods, whose vocabulary improved.
3. *For future Researchers:* The author hopes that findings from this study can be used as an additional reference for future researchers to perform similar studies in various levels and contexts.
4. *For the curriculum maker*: Consider adding Kahoot! games to the curriculum as an alternative method for learning vocabulary.

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