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The Use of Mobile Games on Improving Vocabulary Knowledge of Young Learners: A Case Study in Kermanshah

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Abstract

Today, people live in a digital world, and everyone, from children to adults, can master technology through computers and gadgets. In recent years, gamification has been an important focus of attention in learning English as a foreign language. This study aimed to examine the influence of mobile games on young learners' vocabulary improvement. A mixed- quasi-experimental pre-test and post-test design was implemented, and 30 male and female learners studying English as a foreign language at Iran Language Institute in Kermanshah participated. The quantitative data was analyzed using the independent samples t-test. The qualitative data was gathered through interviews and analysed using MAXQDA software. The results indicated a statistically significant difference in vocabulary achievement between the control and experimental groups. The experimental group performed better and achieved higher results than the control group. However, it was found that there was no statistically significant difference between male and female students regarding their vocabulary improvement. The results of the qualitative part indicated that both male and female students exhibited a positive attitude towards using mobile games. The participants expressed interest, enthusiasm, and motivation while playing the mobile games. They were keen to expand their vocabulary knowledge and acquire new words. Moreover, mobile games facilitate the easier memorization of words. The findings of this study can be useful in language education.

Keywords:

Game,
English,
Teaching,
Improvement,
Knowledge.

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Introduction

Vocabulary in language learning is crucial as it constitutes the essential element of linguistic competence, serving as the basis for learners' abilities to communicate effectively through speaking, listening, reading, and writing (Saldana et al., 2023). Vocabulary knowledge comprises three components: form, meaning, and use (Grimshaw & Cardoso, 2018). Several scholars have contended that comprehending vocabulary and its connection to language competencies enables learners to attain proficiency in all four skills (e.g., Abrar et al., 2018; Li & Cummins, 2019). However, vocabulary acquisition is a challenging aspect of foreign language learning. Also, many novice learners find it burdensome, leading to a lack of motivation in this area (Saeidi & Mozaheb, 2012).

Games are regarded as a helpful method for providing contextualized vocabulary learning. They serve as a valuable supplement to teach language skills, providing opportunities for students to actively utilize the language, develop language proficiency, and enhance their motivation to learn (Kohnke et al., 2019). Given the effectiveness of games for vocabulary learning, the emergence of digital games has further expanded the possibilities for language learning. The digital educational game is a captivating option for classroom use, and numerous studies have explored using mobile phones to facilitate vocabulary learning. These investigations have examined various age groups, from young children to adults (e.g., Taghizadeh, Vaezi & Ravan, 2017).

It can be said that the advent of mobile devices has somehow led to the movement from digital game-based language learning to mobile game-based language learning (Chang & Hwang, 2019). Mobile games can engage students, especially young learners, to improve their learning achievement. Hence, learners can acquire a language outside the classroom. For this reason, researchers have attempted to investigate the influence of games on second language learning among primary and high school students (Hasram et al., 2021; Mubaslat, 2012; Poole & Clarke-Midura, 2020). Previous studies have witnessed the value of using games for educational purposes (Higgings et al., 2012; Klimova & Kacet, 2017). For example, some studies investigated the effect of mobile games on vocabulary learning. Most of them revealed that games can be beneficial for language learning. For example, the effects of computer games on Iranian children have been examined, and the results revealed that the game could improve vocabulary learning (Andreani & Ying, 2019). In another study, Sanosi (2018) stated the benefits of games on vocabulary learning for students.

Previous studies have witnessed the value of using games for educational purposes, and most of them revealed that games could benefit language learning (Klimova & Kacet, 2017; Higgings et al., 2012). According to Gee (2003), players in a gamified environment create their avatars, work with others in affinity groups, choose to play competitively, and demonstrate autonomy and volition. Players often feel satisfied when their results are displayed on leaderboards, highlighting the social element of relatedness. Studies have indicated that the principles of SDT have a positive impact on intrinsic motivation (Alsawaier, 2018). However, according to the author, the number of studies in this field is very small in our country. Therefore, this study aimed to investigate mobile games' effect on improving young children's vocabulary

achievement in Iran. Based on the purpose of the study, the following research questions are answered:

- Is there any significant difference between the vocabulary achievement of young learners aged 8 to 12 using mobile games compared to those not using mobile games?
- Is there any significant difference between the vocabulary achievements of young learners aged 8 to 12 using mobile games regarding their gender?
- Is there a significant difference between the attitudes of male and female young learners aged 8 to 12 towards using mobile games in language learning?

Based on the purpose of the study, the following research hypotheses were answered:

- H01: There is no significant difference between the vocabulary achievements of the young learners using mobile games compared to those not using mobile games.
- H02: There is no significant difference between the vocabulary achievements of young learners using mobile games regarding their gender.
- H03: There is no significant difference between male and female young learners' attitudes toward using mobile games in language learning.

Literature Review

These days, children and adults seem to spend their time playing games. Computer games also increased with the advent of mobile phones, tablets, and laptops. As a result, many technologies have been induced to innovate devices to entertain people and teach various subjects, particularly EFL teaching. For instance, there has been a focus on the effect of mobile games on improving children's language skills. Among these, teaching vocabulary to children has been very important and challenging.

As noted by Zimmerman (1997), vocabulary plays a significant and fundamental role in language and is essential for developing language proficiency among learners. It is widely acknowledged in foreign language education that vocabulary has a central and crucial role (e.g., Alqahtani, 2015; Hyland & Hyland, 2006; Susanto, 2017).

Many studies have focused on vocabulary learning since it plays a significant role in learning a foreign language. It links the four language skills of listening, speaking, reading, and writing. Therefore, vocabulary learning strategies are significant in learning English as a foreign language (EFL). According to Nation's classification, vocabulary learning involves three main strategies. The first is planning, where learners choose words based on their goals. The second strategy is accessing sources to gather information about new vocabulary. The third strategy is establishing vocabulary knowledge by employing techniques to remember and use the learned words.

Furthermore, gamification is a highly engaging learning environment that combines content area, literacy, instruction, and 21st-century learning skills (Kingsley & Grabners, 2015). Bradley (2010) also outlines some beneficial characteristics of games for language learners. Firstly, games can involve all students in the learning process. When students play games in pairs or groups, they have the chance to acknowledge and value the contributions of others and develop their team-building skills. It is generally agreed that digital games possess a range of features that

offer unique learning opportunities and differentiate them from other digital environments studied in education research (Peterson et al., 2022).

In addition, game-based learning (GBL) is an approach that incorporates gameplay into learning and is implemented to engage and motivate learners in a learner-centered classroom. It balances subject content with gameplay and has clear learning outcomes (Ghazal & Singh, 2016). When it comes to language learning, games can have several benefits, including focusing on communicative and functional aspects of language, promoting active involvement, fostering uniqueness and competitiveness in learning, and providing opportunities to use language abilities in various contexts (Alharbi et al., 2021; Kartal & Terziyan, 2016).

Many studies have examined the effectiveness of game-based learning in teaching the English language. Ebadi, Amini, and Gheisari (2023) examined the impact of electronic-based vocabulary instruction on the vocabulary development of intermediate EFL learners in Iran. The study included 60 male and female learners. Half of the participants received electronic instruction through WhatsApp, while the other half received traditional classroom instruction. The experimental group showed significantly improved vocabulary learning compared to the control group. There were no significant differences in vocabulary knowledge between male and female students in the electronic-based instruction group. Qualitative data showed that students preferred electronic-based activities because they reduced mental stress and improved vocabulary learning, conversation, pronunciation, and grammar. They preferred mobile-based activities such as watching movies, listening to music, playing games, watching cartoons, and focusing on movie subtitles to improve their vocabulary.

Sukenasa, Shih, and Surjono (2020) performed a study to investigate the effect of using technology-mediated board games on young learners' learning performance and motivation. The findings indicated that technology-mediated board games could improve students' English vocabulary learning achievement. It was also found that games can encourage young learners to have strong learning motivation.

Abdulrahman and Jullian (2020) conducted a study to examine students' perceptions of using mobile games to motivate young learners to learn English vocabulary. The findings revealed that young learners believed that educational mobile games effectively improve students' engagement and motivation in learning English vocabulary, expand their vocabulary knowledge, and be viewed positively as a supplementary medium of English learning. The study also suggested that mobile games have the potential to stimulate the motivation of children who experience failure in learning. Overall, the study contributed to the literature on vocabulary learning media and the use of mobile games in Indonesia.

Taghizadeh, Vaezi, and Ravan (2017) performed a study to examine the impact of digital games, flashcards, and songs on the vocabulary knowledge of Iranian preschool learners of English as a foreign language (EFL). Another aim of this study was to investigate the EFL students' performance on mid-course vocabulary tests with varying topics. The results indicated that there were not any significant differences in the vocabulary knowledge of preschool learners who used songs, flashcards, and games to learn vocabulary. However, there was a significant difference in the mid-course tests with different topics among the three groups. The findings suggested that using a variety of techniques in the classroom that cater to learners' interests and needs can enhance their vocabulary knowledge.

Derakhshan and Davoodi Khatir (2015) conducted a study to review the effects of games on improving vocabulary learning in an EFL or ESL learning context. The findings indicated that games are helpful in vocabulary learning since they increase the ability to memorise words. They also improve students' communication skills and encourage their interaction.

Salamat and Pourgharib (2013) conducted a study to enhance the speaking skills of English as a Foreign Language (EFL) students using mobile phones. The outcomes revealed that participants who utilized mobile-assisted learning exhibited notably improved performance in a speaking post-test compared to those in the control group.

Gorjian et al. (2012) emphasised that language teaching has adapted to modern changes and technological advancements. They highlighted the integration of network technologies, particularly asynchronous Computer-Assisted Language Learning (CALL) methods. These methods led to the creation of virtual worlds, allowing users to engage in synchronous (online) and asynchronous (offline) communication. Although several studies have investigated mobile games' influence on students' language learning proficiency in general, this topic has received little attention in the Iranian context.

Method

A mixed-quasi-experimental pre-test/post-test design was implemented in this study. The mixed method includes quantitative and qualitative analysis. In the quantitative part, the effect of mobile games on vocabulary learning was examined using a pre-test-post-test design. In the qualitative part, the students' attitudes toward using mobile games for vocabulary learning were assessed using interviews. The study's independent variable was the use of mobile games, and vocabulary achievement of the young learners was the primary dependent variable. The independent-sample T-test statistical technique was utilised to examine the impacts of mobile games on increasing learners vocabulary achievement before and after treatment. The qualitative data was gathered through interviews and analysed via MAXQDA software.

Participants

The sample was chosen from 107 male and female young learners studying English as a foreign language at Iran Language Institute (ILI) in Kermanshah, Iran. In order to ensure the homogeneity of the sample, an Oxford Young Learners Placement Test was administered. According to the results of the above-mentioned test, 30 intermediate-level students were selected as the study sample. The participants, including 15 male and 15 female students aged eight to twelve years, were selected. Their native language was either Kurdish or Persian. Then, the participants were randomly divided into experimental and control groups, and both groups had equal members of 15. To assess their attitude towards the experience, they completed a researcher-made questionnaire developed by Abdulrahman and Jullian (2020). It is important to mention that participants were informed at the outset that their identity and the confidentiality of their responses were guaranteed. Participants informed consent was completed by the participant to ensure that they were all excited about participating in the testing. Sixteen students, 53.03% of the participants in this study were females. While 14 students, 46.07% of the participants were males. Also, 11 students (36.07%) were 10 years old, eight students (26.07%) were 11 years old,

five students (16.07) were 12 years old, four students (13.03%) were 9 years old, and two students (6.07%) were 8 years old. Therefore, the oldest participants were 12, and the youngest were 8. The age variable averaged 10.33, with a minimum of 8 and a maximum of 12.

Instrumentation

The following are the instruments that were used in this research:

- **Young Learners Level Test:** This computer adaptive test is 100% online. Its sign-in system is user-friendly and convenient for kids to use it. It provides immediate results without any delay. Results contain a CEFR level (Pre-A1 to B1). The score is out of 100. It will take 30 minutes to complete the test. It is possible to receive the results by email. It uses bright colors and pictures to motivate the test-takers. This test was taken to assess students' actual level before taking part in the pre-test and before starting the experiment.

- **A Vocabulary Pre- and Post-Test:** This is a researcher-made test based on the words participants learned during the experiment. Both pre and post-tests contained 20 questions. The pre-test was designed to examine the actual level of students' vocabulary knowledge before the treatment. In the post-test, the same test was taken to evaluate participants' improvement after a 12-session treatment. The arrangement of the test questions differed in the pre-test and post-test to prevent the practice effect. The test was considered reliable and valid since its developer was an experienced teacher. The instrument's reliability was assessed using Cronbach's alpha, which yielded a value of .82, indicating satisfactory reliability for the study's purpose.

- **Kahoot Application:** It is a web-based and mobile application designed for learning. It can be freely downloaded on IOS and Android smartphones. It is possible to create various learning modules, including "learn," "flashcards," "match," "true-false," and "puzzle." For this study, the researcher set these modes based on the new words in the ILI textbook, Up and Away 4, taught at the intermediate level. In each session, this application introduced five words to the experimental group. However, the control group learned through the traditional method.

A semi-structured interview for assessing students' attitudes: The semi-structured interview format used in the study allowed for greater flexibility in questioning and gave students more time to prepare their responses. The researcher could adjust the questions related to the research topic and provide participants with ample time to answer. The interview questions were designed carefully to include diverse perspectives, ensuring content validity. In addition, the transparent documentation of the research process, including the interview guide and detailed records of the interviews, contributed to the dependability and transparency of the study. A peer review was conducted by experts in the EFL and research methodology field to provide external validity and ensure that the interview process was robust and comprehensive. Open coding was used to analyze the data.

- **A researcher-made Questionnaire:** The instrument used to examine the attitude of male and female young learners toward using mobile games in language learning was a researcher-made questionnaire developed by Abdulrahman & Jullian (2020). This was a 5-item survey, and items were rated on a 3-point Likert scale with 1 "disagree", 2 "neutral", and 3 "agree". The subscales of the questionnaire included:

- preference for learning English vocabulary through games,
- perceived ease of learning English words through games,

- perception of improvement in English knowledge through vocabulary games,
- avoidance of boredom while studying English through mobile games, and
- motivation to learn English vocabulary through mobile games compared to other media.

The total score for the instrument was obtained by summing up the scores of each item from 15 responses. The internal reliability of the instrument was evaluated using Cronbach's alpha. The coefficient alpha ($> .6$) is considered acceptable (Reupert & Woodcock, 2010). Furthermore, the instrument's reliability was assessed by running Cronbach's alpha, which yielded a value of .79, indicating satisfactory reliability for the study's purpose.

Data Collection Procedure

Thirty students were selected at the same levels of proficiency. They were randomly assigned to two different groups of 15: one experimental group and one control group. The treatments were given over 12 sessions, 3 days a week. The syllabus in both groups was the same, except the control group used no multimedia tool (i.e., mobile set, tablets). The experimental group participants had experience using mobile phones and the Internet. The vocabulary test was used as a pre-test, and each participant took a vocabulary test separately to ensure there was no substantial difference in vocabulary knowledge between the two classes.

Participants were given treatments; half were instructed through mobile games, in which they practiced English vocabulary using a mobile set, and the other half used Kahoot games to instruct the students. It is an application that can be installed on smartphones and tablets. The teacher asked all the students in the treatment group to install this application on their phones before starting the treatment. In each session, the teacher introduced five new words through this application. First, the students could see the word, its spelling, and the picture in the "learn" mode section and hear the pronunciation. Then, they could start various games like "flashcards," "match," "true-false," and "puzzle". They were allowed to use the application at home to review the words and do the games again.

On the other hand, the other half used the traditional method for learning words and never used a mobile. In their twelve-session classes, the teacher introduced five new words by showing flashcards and saying them aloud. Then, she would ask them to repeat the words. The students were supposed to practice the words at home and write the new words as their homework. After 12 treatment sessions, a vocabulary test as a post-test was administered for two groups. The experimental group took part in an interview and answered the questionnaire questions regarding their attitude towards using mobile games in language learning.

Findings and Discussion

As previously stated, the current study aimed to investigate the impact of mobile games on enhancing the vocabulary achievement of young children in Iran. To this end, a mixed- quasi-experimental pre-test and post-test design was used to analyze data using a paired two-sample t-test. The analysis of the data was conducted through two stages. In the first stage, the participants took a pre-test to see whether they were homogenous in terms of their vocabulary knowledge or not. Table 1 indicates the mean and standard deviation of the pre-test and among the participants.

Table 1. Descriptive Statistics of Pre-test

Group	N	Mean	Standard deviation
Control	15	13.60	0.985
Experimental	15	13.26	0.883

As indicated in Table 1, the mean scores of the control and experimental groups were 13.60 and 13.26, with a standard deviation of 0.985 and 0.883, respectively. After the pre-test, a normality test, including Kolmogorov-Smirnov, was used to examine the normality assumption. The results indicated that the z value was equal to 1.357. Therefore, the normality assumption was met. Then, the independent samples t-test was used to compare the pre-test scores of the experimental group and the control group to see whether or not there was a statistically significant difference between them in terms of vocabulary knowledge. The results are indicated in Table 2 below.

Table 2. Results of the independent samples t-test for comparing the pre-test score of the experimental group and the control group

		Independent Samples Test								
		Levenes Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Std. Error	Mean Difference	Std. Error	95% Confidence Interval of the Difference	
									Lower	Upper
p	Equal variances assumed	.46	.50	-.28	28	.56	-.28	.34	-.94	.37
		.46	.50	-.28	28	.56	-.28	.34	-.94	.37
r	Equal variances not assumed	.46	.50	-.28	28	.56	-.28	.34	-.94	.37
		.46	.50	-.28	28	.56	-.28	.34	-.94	.37

s t	Equal	-	2	.5	-	.3	-	.5
	varian	.	7	6	.2	4	.9	08
	ces not	5	.	7	0	5	0	00
	assume	7	7		0	4	8	
	d	9	4		0	9	0	
			6		0		0	

Concerning the significance level, which was 0.567 and more than 0.05, it can be said that at the 95% confidence level, there was no statistically significant difference between the control and experimental groups regarding vocabulary pre-test results.

The first research question was, "Is there any significant difference between the vocabulary achievements of young learners using mobile games compared to those not using mobile games?" A quantitative data analysis procedure was implemented to answer the first research question. The participants' post-test scores were utilized as the quantitative data. First, a Kolmogorov-Smirnov test was used to assess the normality of post-test results. The result of this test was equal to 1.144. Therefore, it was concluded that the normality assumption was met. Then, the paired sample t-test was used for both groups. The results are indicated in Table 3 below.

Table 3. The results of paired samples test for comparing the pre-test and post-test scores of the experimental group and the control group

		Paired Differences					t	d f	Sig. (2- taile d)
		M e a n	Std. Devi ation	Std. Error Mea n	95% Confidence Interval of the Difference				
					Low er	Uppe r			
c o n t r o l	Pre- test	- 2. 8	1.06 010	.273 72	- 3.45 373	- 2.279 60	- 1 0.	1 4	.000
	Post- test	6 6 6 7					4 7 3		
	Pre- test	- 5. 3	.975 90	.251 98	- 5.87 377	- 4.792 90	- 2 1.	1 4	.000
	Post- test	3 3 3 3 3					1 6 6		

a
l

As can be seen, the significance level was 0.000, which is lower than 0.05. Therefore, there was a statistically significant difference between the pre and post-test scores in both groups.

After that, an independent samples t-test was run to compare the two groups' post-test scores. The results are indicated in Table 4 below.

Table 4. Results of the independent samples t-test for comparing the post-test scores of the experimental group and the control group

		Independent Samples Test								
		Levenes Test for Equality of Variances			t-test for Equality of Means					
		F	Si g.	t	d f	Si g. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
post-test	Equal variances assumed	.891	.353	1.0	28	.000	2.133	.282	1.70	2.518
	Equal variances not assumed			1.09	29	.000	2.133	.282	1.07	2.96

As it can be seen, the significance level was 0.000 which is lower than 0.05. Therefore, there was a statistically significant difference between the control and experimental groups regarding vocabulary achievement. That is, the experimental group outperformed regarding vocabulary knowledge and gained better results. Therefore, the first null hypothesis is rejected.

The second question of the study was, "Is there any significant difference between the vocabulary achievements of the young learners using mobile games regarding their gender?" To answer this question, the independent samples t-test was run. The results were as follows:

Table 5. Results of the independent sample t-test for comparing male and female post-test scores in the experimental group

		Independent Samples Test								
		Levenes Test for Equality of Variances			t-test for Equality of Means					
pos t- test	Equal variance s assumed	F	Si g.	t	d f	Si g. (2- tai le d)	M ea n Di ffe re nce	St d. Er ror Di ffe re nce	95% Confidence Interval of the Difference	
									Lo we r	Up pe r
pos t- test	Equal variance s assumed	.4 78	.5 02	- 4 8 6	1 3	.6 35	- 66 67	.3 42 81	- .9 07 27	.57 39 4
	Equal variance s not assumed			- .5 1 3	1 2 5 7 8	.6 17	- 66 67	.3 24 89	- .8 70 95	.53 76 2

Table 5 shows the vocabulary knowledge of the experimental group after the intervention. Given the significance level, which was 0.635 and more than 0.05, it can be said that at the 95% confidence level, there was not a statistically significant difference between the male and female students in the experimental group regarding vocabulary post-test results. In fact, the post-test results indicated that the intervention did not show a preference for either the male or female group in terms of their vocabulary knowledge after the treatment. In other words, there was no notable variation between the vocabulary knowledge of female and male participants as a result of the intervention. As a result, the second null hypothesis is confirmed.

The third question of the study was, "Is there a significant difference between the attitudes of male and female young learners toward the use of mobile games in language learning?" To answer this question, interviews were conducted with all the experimental group members. Also, a researcher-made questionnaire (based on the article of Abdulrahman & Jullian, 2020) was

distributed among the students of the experimental group. The Likert scale was used to evaluate five questions, with responses ranging from 1 (Disagree) to 2 (Neutral) and 3 (Agree). The results of the interview revealed the following main themes:

Table 6. The frequency and percentage of codes obtained regarding the Interview Questions

Code	Frequency	Percentage
Efficiency of games for learning	5	33.03
reduced stress of learning	4	26.07
Making learning more enjoyable and funnier	4	26.07
Motivation and interest in learning through games	3	20.00
Natural learning through games	2	13.03
DOCUMENTS with code(s)	15	100.00

As indicated in Table 4.6, 33.03% of the interviewees mentioned the efficiency of games for learning through mobile games. Therefore, it had the highest frequency. For example, one of the respondents said:

"I love using games to learn English vocabulary because they help me learn new words faster."

According to the results, 26.07% of the respondents referred to the code of "reduced stress of learning". That is, mobile games could decrease the amount of stress while learning. For example, one respondent demonstrated that:

"I feel that games are a great way to learn English vocabulary because they make learning feel less like a chore and more like a game."

The following code extracted from the content analysis was "making learning more enjoyable and funnier," and 26.07 % of the interviewees referred to this concept. For instance, one of them said:

"I love using games to learn English vocabulary because they're more fun than traditional methods."

Another code was motivation and interest in learning through games, and 20% of the respondents demonstrated this code.

For instance, one of the said:

"I think games are great for learning English vocabulary because they make it more interactive and engaging."

The code with the least frequency was "Natural learning through games." Only 13.03% of the respondents demonstrated this concept. For example:

"I feel that games are a great way to learn English vocabulary because they allow me to practice using the words in context."

After the interview, the questionnaire was distributed and analyzed. The results were as follows:

Table 7. The percentage of questionnaire scores

Question	Agree (%)	Neutral (%)	Disagree (%)
1. I prefer to learn English vocabulary through games	100	0	0
2. I understand English words easily if I learn through game	80	20	0
3. I feel that vocabulary games improve my English knowledge	93	6.7	0
4. I don't feel bored when I study English by using mobile game	86.7	13.3	0
5. I feel more motivated to learn English vocabulary through mobile games than any other media.	60	40	0

As indicated, the students had a positive view towards using mobile games for vocabulary learning. An independent sample t-test was used to compare the attitudes of male and female students in the experimental group attitude regarding the use of mobile phones for vocabulary learning, and the results were as follows:

Table 8. Results of the independent sample t-test for comparing male and female attitudes regarding the use of mobile phones for vocabulary learning in the experimental group

Independent Samples Test

Levenes Test for Equality of Variances		t-test for Equality of Means						
F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper

V	Equal	.	.	1	6	.1	1.2	.80	-	3.2
A	variances	63	85	81	.69	631
R	assumed			5			71	2	16	2
0				9					9	
0				1						
0							1.2	.	.	.
0	Equal						85			
3	variances						71			
	not									
	assumed.									

Table 8 shows the attitudes of male and female respondents' attitudes in the experiment towards using mobile games in language learning. Given the significance level, which was 0.163 and more than 0.05, it can be said that at the 95% confidence level, there was not a statistically significant difference between the male and female students in the experimental group in terms of their attitude towards the use of the mobile game for vocabulary learning. Both male and female students had a favorable view regarding the effectiveness of mobile games for vocabulary learning. The findings can have various reasons. For example, using mobile games can encourage young EFL learners to have higher motivation in vocabulary learning. This outcome is consistent with Sukenasa, Shih, and Surjono's (2020) findings, which suggested that technology-mediated board games can enhance students' achievement of English vocabulary learning.

Another reason may be that using mobile games can help teach in a very engaging and enjoyable way to prevent children from getting bored and losing concentration. This is in line with the findings of Taghizadeh, Vaezi, and Ravan (2017), who concluded that digital games, flashcards, and songs had a beneficial impact on children's foreign language vocabulary learning, and these techniques can foster the development of their English vocabulary.

The third probable reason is that incorporating game scenarios into real-life learning contexts can facilitate better understanding and retention of vocabulary words through social interaction. Students construct their knowledge by interacting with their peers when playing games. This is in line with the findings of Derakhshan and Davoodi Khatir (2015), who found that games effectively improved EFL students' vocabulary retention and concluded that games can improve vocabulary knowledge by enhancing the ability to memorize words.

The second question of the study asked whether there was any significant difference between the vocabulary achievements of the young learners using mobile games regarding their gender or not. A quantitative data analysis approach was used to answer this question. The pre-test and post-test scores of the participants found no statistically significant difference in vocabulary knowledge between male and female EFL learners in the experimental group. Therefore, the second null hypothesis was confirmed. The findings confirmed the results of Salamat and Pourgharib's (2013) research, which investigated the efficacy of EE activities in improving the speaking ability of EFL students.

The third question of the study asked whether there was a significant difference between the attitudes of male and female young learners toward the use of mobile games in language learning. Both qualitative and quantitative data analysis approaches were used to answer this question. In the qualitative part, a semi-structured interview was conducted. Five questions were asked of the experimental group members, including eight female and male respondents, and a

content analysis was used to analyze the interviews. The interview responses were recorded, coded, and analyzed using MAXQDA software. In the quantitative part, a researcher-made questionnaire was designed based on the article of Abdulrahman and Jullian (2020). It was a 5-item survey, and items were rated on a 3-point Likert scale. According to the codes extracted from the interviews, some central themes were obtained: more than half of the interviewees pointed to the effectiveness of learning through games. The results indicated that all participants believed that games were highly effective for vocabulary learning, which was reflected in their active participation in class. The results were in line with the findings of Ali et al. (2022), who found that the web-based game was effective in helping learners retain targeted words in their memory for a short period. They were also consistent with the results of Gorjian et al. (2012), who found that Iranian undergraduates, regardless of their achievement level, were able to retain vocabulary in the short term when web-based language learning was used.

According to the questionnaire and interview responses, the students in the experimental group enjoyed the games and were eager to participate in every activity. This finding followed the results of Abdulrahman and Jullian (2020), who found that students had a positive response to using mobile games for learning vocabulary and suggested that playing games can be regarded as a fun and enjoyable way for children to practice their English language skills.

The findings showed that mobile games can motivate students in learning activities and enhance their knowledge. Therefore, it was consistent with a study performed by Castillo-Cuesta (2020), who stated that students found using digital games in Educaplay to be a motivating way to learn English and engage with the activities on their Canvas virtual platform. The interactive nature of the games promoted active and dynamic learning, and the ability for creating and sharing engaging educational activities increased their interest in learning the language.

However, the results revealed that there were not any statistically significant differences between the attitudes of male and female students towards the use of mobile games for language learning. This result was in contrast to those of Alrefaai (2019), who found that female students had a more positive attitude towards using mobile phones for EFL learning than male students.

Conclusion

This study aimed to evaluate the effect of mobile games on vocabulary achievement of young learners. Vocabulary achievement of Iranian EFL learners is considered a significant and crucial requirement. Therefore, integration of technology into teaching and learning English is vital. The results indicated the effectiveness of mobile games for vocabulary achievement. However, no statistically significant difference was observed between male and female students in terms of their vocabulary improvement. In addition, participants' opinions about using mobile games for language learning were gathered through semi-structured interviews. The results indicated both male and female students' positive attitudes towards using mobile games. In general, this study revealed that integrating mobile games promoted young learners' engagement in learning vocabulary. Participants showed interest, enthusiasm, and motivation while playing the games. They were eager to expand their vocabulary knowledge and learn new words. The mobile games also helped students to memorize the words more easily. The study implies that utilizing mobile games can be a valuable technique for encouraging participation and enhancing the learning experience when it comes to acquiring vocabulary for young learners.

Based on the findings of this study, EFL teachers should be aware that traditional approaches to teach vocabulary may not be practical and should consider using virtual and online-based practices instead. Also, TTC trainers are recommended to introduce different game-based applications and websites that can facilitate learning. Moreover, the results can benefit material designers to be aware that they should include new technology and games in the academic syllabus. Assessing learners' vocabulary knowledge is crucial to EFL teaching and learning. Various classroom techniques, such as gamification, can enhance young learners' comprehension skills. Using mobile games in English classes can help young learners enhance vocabulary knowledge in the Iranian EFL context. However, further research is needed to gain a deeper understanding of the effectiveness of this approach. The present study suggests implications for language teachers, language center managers, and school principals. The outcomes of this study can guide future research in this area and offer recommendations. A replication of the study with a larger sample size is suggested to generalize the findings to a broader population. It is also recommended that various proficiency levels, such as basic and advanced levels, be included in the replication. Additionally, future studies can use different digital game-based applications.

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