

**Research Paper**

## 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 is able to master technology in the form of computers and gadgets. In recent years, the use of gamification has been an important focus of attention in English as foreign language learning. This study aimed to examine the influence of using mobile games on the vocabulary improvement of young learners. A mix- quasi-experimental pre-test – post-test design was implemented in which 30 male and female young 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 analyzed using MAXQDA software. The results indicated a statistically significant difference between the control and experimental groups in terms of vocabulary achievement. The experimental group performed better and achieved higher results compared to the control group. However, it was found that there was no statistically significant difference between male and female students regarding their improvement in vocabulary. The results of qualitative part indicated that both male and female students exhibited a positive attitude towards the use of mobile games. The participants expressed interest, enthusiasm, and motivation while playing the mobile games. They displayed a keen desire to expand their vocabulary knowledge and acquire new words. Moreover, the mobile games facilitated easier memorization of the words. The findings of this study can be useful in language education.

**Keywords:**

Game,  
English,  
Teaching,  
Improvement,  
Knowledge.

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## Introduction

The role of 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 including 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 useful 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 the use of mobile phones to facilitate vocabulary learning. These investigations have examined a diverse range of 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 and especially young learners to improve their learning achievement. Hence, learners can acquire a language outside the classrooms. For this reason, researchers have attempted to investigate the influence of games on second language learning among primary to 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. As an example, the effects of using computer games on Iranian children have been examined which revealed the game could improve vocabulary learning (Andreani & Ying, 2019). In another study, Sanosi (2018) stated the benefits of games on vocabulary learning of students.

Previous studies have witnessed the value of using games for educational purposes and most of them revealed that games can be beneficial for language learning (Klimova & Kacet, 2017; Higgings et al., 2012). According to Gee (2003), players in a gamified environment create their own avatars, work with others in affinity groups, choose to play competitively, and demonstrate autonomy and volition. Players often feel a sense of satisfaction 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, up to the author's knowledge, the number of studies in this field has been very small in our country. Therefore, this study aimed to investigate the effect of using mobile games

on improving the vocabulary achievement of young children 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 the use of 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 the young learners using mobile games regarding their gender.
- H03: There is no significant difference between the attitudes of male and female young learners toward the use of mobile games in language learning.

## Literature Review

These days, it seems that the children and even adult time is mostly occupied with games. With the advent of mobile phones, tablets, laptops, and so on, the use of computer games also increased. As a result, many technologies have been induced to innovate devices to entertain people as well as to learn various subjects particularly EFL teaching. For instance, there have been a focus on the effect of mobile games on improving language skills of children. Among this, teaching vocabulary to children has been very important and challenging as well.

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

A vast number of 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 considered very significant in the process of English as a foreign language (EFL) learning. 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 concept which is defined as a highly engaging learning environment that combines content area, literacy, instruction, and 21st-century learning skills (Kingsley and Grabners, 2015). Bradley (2010) also outlines some beneficial characteristics of games for language learners. Firstly, games have the ability to 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 that have been studied in education research (Peterson et al., 2022).

In addition, game-based learning (GBL) is an approach that incorporates gameplay into learning, 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 been conducted to examine the effectiveness of game-based learning in teaching 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 significant improvement in 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 resulted in less mental stress, improved vocabulary learning, conversation, pronunciation, and grammar. They preferred various 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 learning performance of young learners and their learning motivation. The findings indicated that technology-mediated board games were able to improve English vocabulary learning achievement of students. It was also found that using games can encourage young learners to have strong learning motivation.

Abdulrahman and Jullian (2020) conducted a study to examine the perception of students regarding the use of mobile games to motivate young learners to learn English vocabulary. The findings revealed young learners believed that educational mobile games effectively improve students' engagement and motivation in learning English vocabulary, expand their vocabulary knowledge, and view 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 tests of vocabulary with varying topics. The results indicated that there were not any significant differences in the vocabulary knowledge of preschool learners who used songs, flashcards as well as 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 the use of games on improving vocabulary learning in an EFL or ESL learning context. The findings indicated that games are useful in vocabulary learning since they increase the ability to memorize words. They also improve communicative skills of students and encourage their interaction.

Salamat and Pourgharib (2013) conducted a study aimed at enhancing 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) emphasized 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 both synchronous (online) and asynchronous (offline) communication. Although a number of studies have investigated the influence of mobile games on language learning proficiency of students in general, this topic has received little attention in Iranian context.

## Method

A mixed-quasi-experimental pre-test/post-test design was implemented in this study. 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 attitudes of the students towards the use of mobile games for vocabulary learning were assessed using interviews. The independent variable of the study was the use of mobile games, and vocabulary achievement of the young learners was the main dependent variable. To examine the impacts of mobile games on increasing learners' vocabulary achievement before and after treatment, the independent-samples T-test statistical technique was utilized. The qualitative data was gathered through interviews analyzed via MAXQDA software.

## Participants

The sample was chosen from among 107 male and female young learners who were 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 administrated. 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 with the age range of eight to twelve years were selected. Their native language was either Kurdish or Persian. Then, the participants were randomly divided into two groups: experimental and control 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, 8 students (26.07%) were 11 years old, 5 students (16.07) were 12 years old, 4 students (13.03%) were 9 years old, and 2 students (6.07%) were 8 years old. Therefore, the oldest participants were 12 and the youngest were 8. The age variable had an average of 10.33, minimum 8 and maximum 12.

### Instrumentation

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

- **Young Learners Level Test:** It is a computer adaptive test which 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 the real level of students 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 that participants learned during the experiment process. Both pre and post-tests contained 20 questions. The pre-test was designed to examine the real level of students' vocabulary knowledge before the treatment. In the post-test, the same test was taken to evaluate the improvement of participants after a 12-session treatment. The arrangement of the test questions was different in pre-test and post-test to prevent practice effect. The test was considered reliable and valid since its developer was an experienced teacher. The reliability of the instrument 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 a mobile application designed with learning purposes. 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 presented on ILI text-book namely Up and Away 4 which is taught in intermediate level. In each session, 5 words were introduced to the experimental group using this application. However, the control group learned through traditional method.

**A semi-structured interview for assessing students' attitude:** 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 had the ability to adjust the questions related to the research topic and provide participants with ample time to answer. The interview questions were designed carefully to include a diverse range of perspectives, ensuring content validity. In addition, the transparent documentation of the research process, including the interview guide and detailed records of the interviews was followed contributes 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. To analyze the data, open coding was used.

- **A researcher-made Questionnaire:** The instrument used to examine the attitude of male and female young learners toward the use of 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 reliability of the instrument was assessed by running Cronbach’s alpha, which yielded a value of .79, indicating satisfactory reliability for the study’s purpose.

### **Data Collection Procedure**

To achieve the study’s goals, 30 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 a period of 12 sessions, 3 days a week. The syllabus in both groups was the same except that in the control group, they used no multimedia tool (i.e., mobile set, tablets). The experimental group participants had the experience of using mobile 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 in which half were instructed through mobile games in which they practiced English vocabulary using a mobile set and Kahoot game which was used 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 used to introduce 5 new words through this application. First, the students could see the word, its spelling and picture in the “learn” mode section, they were also able to 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 5 new words through showing flashcards and saying the words out loud. 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 sessions of treatment, 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 the use of mobile games in language learning.

## Findings and Discussion

As previously stated, the aim of the current study was to investigate the impact of utilizing mobile games to enhance the vocabulary achievement of young children in Iran. To this end, a mix-quasi-experimental pre-test – post-test design was used to analyze data using paired two samples 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 score 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, test of Normality including Kolmogorov-Smirnov was used to examine the normality assumption. The results indicated that z value was equal to 1.357. Therefore, the normality assumption was met. Then, the independent samples t-test was used for comparing the pretest score of the experimental group and the control group to see whether there was a statistically significant difference between them in terms of vocabulary knowledge or not. The results are indicated in table 2 below.

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

<b>Independent Samples Test</b>								
Levene's Test for Equality of Variances		<b>t-test for Equality of Means</b>						
F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	<b>95% Confidence Interval of the Difference</b>	
							Lower	Upper



		d				n				
		)				ce				
<b>p r e s t</b>	Equal	.4	.5	-	2	.5	-	.3	-	<b>.5</b>
	varianc	6	0	.	8	6	.2	4	.9	<b>07</b>
	es	4	1	5		7	0	5	0	<b>71</b>
	assume			7			0	4	7	
	d			9			0	9	7	
							0		1	
	<b>Equal</b>			-	<b>2</b>	<b>.5</b>	-	<b>.3</b>	-	<b>.5</b>
	<b>varian</b>			.	<b>7</b>	<b>6</b>	<b>.2</b>	<b>4</b>	<b>.9</b>	<b>08</b>
	<b>ces not</b>			<b>5</b>	.	<b>7</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>00</b>
	<b>assume</b>			<b>7</b>	<b>7</b>		<b>0</b>	<b>4</b>	<b>8</b>	
<b>d</b>			<b>9</b>	<b>4</b>		<b>0</b>	<b>9</b>	<b>0</b>		
				<b>6</b>		<b>0</b>		<b>0</b>		

With regard to the significance level, which was 0.567 and more than 0.05, it can be said that at the 95% confidence level, there was not a statistically significant difference between the control and experimental groups in terms of vocabulary pre-test results.

The first research question was, “Is there any significant difference between the vocabulary achievements of the young learners using mobile games compared to those not using mobile games?” To answer the first research question, a quantitative data analysis procedure was implemented. The scores obtained by the participants in post-tests 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 score of the experimental group and the control group

<b>Paired Samples Test</b>		Paired Differences				t	d	Sig. (2-tailed)
		M	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			
					Lower	Upper		
c o n t r	Pre-test	-	1.06010	.27372	-	-	-	.000
	Post-test	2.86			3.45373	2.27960	1.043	

o		6							
l		7							
e	Pre-	-	.975	.251	-	-	-	1	.000
x	test	5.	90	98	5.87	4.792	2	4	
p		3			377	90	1.		
e	Pest-	3					1		
r	test	3					6		
i		3					6		
m		3							
e									
n									
t									
a									
l									

As it is 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 for comparing the post-test scores of the two groups. The results are indicated in table 4 below.

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

		Independent Samples Test								
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Si	t	d	Si	M	St	95% Confidence Interval of the Difference	
			g.		f	g.	ea	d.	Lo	U
						(2	n	Er	w	pp
						-	Di	ro	er	er
						tai	ffe	r		
						le	re	Di		
						d)	nc	ffe		
							e	re		
								nc		
								e		
<b>post-</b>	Equal	.8	.3	1	2	.0	2.	.2	1.	<b>2.5</b>
<b>test</b>	variance	91	53	0	8	00	13	10	70	<b>65</b>
	s			.			33	82	14	<b>18</b>
	assumed			1			3		9	
				1						
				9						

<b>Equal variances not assumed</b>	<b>1 0 . 1 1 9</b>	<b>2 6 . 9 2 3</b>	<b>.0 00  33 3</b>	<b>2. 13  33 3</b>	<b>.2 10 82</b>	<b>1. 70 07 1</b>	<b>2.5 65 96</b>
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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 the vocabulary achievement. That is, 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 posttest scores in the experimental group

		<b>Independent Samples Test</b>								
		Levene's Test for Equality of Variances			t-test for Equality of Means					
	posttest	F	Si g.	t	d f	Si g. (2-tailed)	Mean Difference	Standard Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Equal variances assumed	Equal variances assumed	.478	.502	-1.4	13	.1635	-.166	.342	-.907	.5739
	Equal variances not assumed			-1.486	12	.1517	-.166	.342	-.870	.5376

Table 5 shows the vocabulary knowledge of 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 experimental group in terms of vocabulary post-test results. In fact, the posttest 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
<b>Efficiency of games for learning</b>	5	33.03
<b>reduced stress of learning</b>	4	26.07
<b>Making learning more enjoyable and funnier</b>	4	26.07
<b>Motivation and interest in learning through games</b>	3	20.00
<b>Natural learning through games</b>	2	13.03
<b>DOCUMENTS with code(s)</b>	15	100.00

As it is 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 next 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 it's 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 my English knowledge is improved by vocabulary games	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 motivated to learn English vocabulary through mobile games than any other medias.	60	40	0

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

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

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### Independent Samples Test

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		Levene's 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 A R I A N C E S	Equal variances assumed	.000	.999	1.609	61	.113	1.285	.808	-.169	3.262
	Equal variances not assumed						1.285			

Table 8 shows the attitude of male and female respondents in the experimental towards the use of 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 experimental group in terms of their attitude towards the use of mobile game for vocabulary learning. In fact, both male and female students had a positive view regarding the effectiveness of mobile games for vocabulary learning.

This finding can have various reasons. For example, using mobile games can encourage EFL young learners to have higher motivation in vocabulary learning. This can be consistent with the findings of Sukenasa, Shih and Surjono (2020) who suggested that technology-mediated board games can enhance English vocabulary learning achievement in students.

Another reason may be that using mobile games can help teaching in a very engaging and interesting way to avoid children from getting bored and losing their 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 knowledge.

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. When students play games, they construct their knowledge by interacting with their peers. This is in line with the findings of Derakhshan and Davoodi Khatir (2015) who found that games were effective in improving vocabulary retention of the EFL students 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 young 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 or not. To answer this question, both qualitative and quantitative data analysis approaches were used. In the qualitative part, a semi-structured interview was conducted. Five questions were asked from 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 based on the article of Abdulrahman & 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 main themes obtained as follows: more than half of interviewees pointed to the effectiveness of learning through games. In fact, 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 of time. They were also consistent with the results of Gorjian et al., (2012) 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 it was revealed that the students in the experimental group enjoyed the games and were eager to participate in every activity. This finding was in accordance with 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 the use of 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, according to the results, it was revealed that there were not any statistically significant differences between the attitude 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 compared to male students.

## Conclusion

The purpose of this study was to evaluate the effect of mobile games on vocabulary achievement of young learners. Vocabulary achievement of Iranian EFL learners is considered significant and a 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, the opinions of participants towards the use of mobile games for language learning were gathered through semi-structured interviews. The results indicated the positive attitude of both male and female students towards the use of mobile games. In general, this study revealed that integrating mobile games was successful in promoting 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 easier. In general, the study implies that utilizing mobile games can be a useful 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 are recommended should be aware that traditional approaches for teaching vocabulary may not be effective and they 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 be beneficial for material designers to be aware that they should include new technology and games in the academic syllabus. Assessing vocabulary knowledge of learners is a crucial yet important aspect of EFL teaching and learning. To enhance the young learners' comprehension skills, various techniques can be used in the classroom, such as digital mobile games which combine technology and education in an engaging way. The use of mobile games in English classes can help young learners to 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 wider population. It is also recommended to include various proficiency levels, such as basic and advanced levels, in the replication. Additionally, the future studies can use different digital game-based applications.

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