



The Effect of Mobile-Assisted Language Learning Using Tiny Cards App on Iranian Intermediate EFL Learners' Vocabulary Learning and Retention



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Abstract

Emerging technologies have brought about major changes in the teaching and learning processes, and there is no doubt that the rapid growth of technology has significantly changed the way English teachers transfer knowledge to their students. Accordingly, this study investigated the effect of MALL using Tiny Cards app on Iranian intermediate EFL learners' vocabulary learning and retention. It was a quantitative research employing a quasi-experimental design. Forty intermediate EFL learners, taking English course at Farzan English Language Institute, Rasht, Iran, were selected as homogeneous participants based on Quick Placement Test. Next, they were non-randomly divided into one experimental group (N = 20) and one control group (N = 20). Before the onset of treatment, a pretest of vocabulary was administered to certify the learners' initial knowledge of vocabulary items. The groups then received the treatment on their vocabulary for eight sessions. The experimental group received instruction of vocabulary through Tiny Cards app. The control group, however, received the same items but approached them through traditional method of instruction without MALL. Overall, the results of independent-samples t-tests for the posttest and delayed posttest of vocabulary revealed that there was a statistically significant difference between the two groups in their performance on the posttest and delayed posttest of vocabulary learning and retention. Finally, it was concluded that the findings can be utilized by the teachers, materials developers, and education authorities to provide Iranian EFL learners with MALL vocabulary instruction.

Keywords: App; MALL; Retention; Tiny cards; Vocabulary learning.

1. Introduction

As mobile phones with high capabilities extend into all areas of human life, it is expected that this wireless computing device soon becomes accessible for all urban and rural areas of each country. In fact, as Sharples (2000) maintained, mobile learning can be considered as the next generation of e-learning. There is no doubt that the rapid growth of technology has significantly changed the way English teachers transfer knowledge to their students. Similarly, Pavlik (2015) stated that emerging technologies have brought about major changes in the teaching and learning processes. Mobile phones, one of these technologies, have led to a proliferation of studies that explore their use in education. As Stockwell (2008) highlighted, the big and touch-sensitive screens of today's smartphones offer great advantages in contrast to pre-smartphone mobile devices.

Without question, vocabulary is a very important language component that is practically used in improving and boosting all other language skills. As Gürkan (2018) notes, among the components of language learning, vocabulary has attracted much attention of researchers lately. Tassana-ngam (2004), states that vocabulary is quite influential on reading skill. It might facilitate particularly comprehension of second language learners on a written text on the condition that the learners' vocabulary knowledge is lower or below the threshold minimum of approximately 3000

words. Yet, the integration of Mobile-Assisted Language Learning (MALL) in teaching vocabulary is commonly ignored in TEFL to a high extent, and most teachers resort to the traditional ways of teaching vocabulary. While studies have focused on English vocabulary learning and teaching, few studies have looked at the influence of mobile phone and the related applications on the improvement of EFL learners' vocabulary knowledge. Moreover, such studies have not explored the influence of mobile phone on the vocabulary retention of the EFL learners.

This study investigated the way of effective learning through mobile technologies, a shift from teacher-led learning to student-led one, via m-learning. In other words, it intended to investigate the effect of MALL using Tiny Cards app on Iranian intermediate EFL learners' vocabulary learning and retention. In this regard, it dealt with the following null hypotheses:

H₀₁. MALL using Tiny Cards app does not have any statistically significant effect on Iranian intermediate EFL learners' vocabulary learning.

H₀₂. MALL using Tiny Cards app does not have any statistically significant effect on Iranian intermediate EFL learners' vocabulary retention.

2. Literature Review

Several studies have investigated the effect of MALL on vocabulary learning. [Ou-Yang and Wu \(2017\)](#), believed that MALL is an adaptive process: Language learners' proficiency level, perceptual learning style and learning behavior-r play a role in the process. [Lin and Yu \(2012\)](#), declared that many studies have focused in the combination of picture and text rather than sound and text with regard to MALL and vocabulary learning. They used different modes of presentation, i.e., text in isolation, a combination of text and picture, a combination of text and sound, and finally merging all modes together. The results of the study revealed that audio representation of the words reduced the cognitive load and increased the chances of retaining the words.

[Agca and Özdemir \(2013\)](#), integrated multimedia content into learning materials and gauged its effect on vocabulary learning. They also delved into the students' ideas about this new learning environment. This study revealed that MALL had considerable effect on language learners' vocabulary learning. [Choi and Jeong \(2010\)](#) conducted another study which investigated the effect of cellphone applications on learning vocabulary in Korea by. Their study focused on the effect of Long Message Service (LMS) on learning L2 vocabulary. It revealed that LMS lessons were more effective than paper materials for learning L2 vocabulary; however, interaction did not have a considerable role in this effect.

[Thornton and Houser \(2005\)](#) developed several innovative projects using mobile phones to teach English at a Japanese university. One focused on providing vocabulary instruction by SMS. The authors theorized that their lessons had been effective due to their having been delivered as push media, which promote frequent rehearsal and spaced study, and utilized recycled vocabulary. [Kiernan and Aizawa \(2004\)](#), probed whether or not mobile phones were useful language learning tools and explored their use in task-based learning. They argued that second language acquisition is best promoted through the utilization of tasks, which require learners to close some sort of gap, thereby focusing the learner on meaning. In this regard, [Levy and Kennedy \(2005\)](#) also showed while the applications of cell phones have typically been pedagogic in nature, they have also been used for practical or administrative matters, such as simplified and flexible student-teacher communications (e.g., course updates and reminders) and referrals to related websites and other up-to-date instructional resources.

3. Methodology

This study was done using a quantitative research implying a quasi-experimental design to test whether utilizing Tiny Cards app had any statistically significant effect on the Iranian intermediate EFL learners' learning and retention of vocabulary. Thus, a pretest-treatment-posttest design was used to assess the hypotheses of the study. The participants were chosen from intact classes, and no randomization was inevitably done. However, they were non-randomly assigned to two groups namely as the control and experimental groups after administering the homogeneity test. There were three variables in this research. The first one was referred to as Tiny Cards app as an independent variable that was an intervention as a treatment experienced by the experimental group. The second and third variables were referred to as the participants' learning and retention of vocabulary as the dependent variables. [Table 1](#) depicts the schematic representation of the design.

Table-1. The design of the study

	Pretest	Intervention	Posttest	Delayed posttest
Ex. G.	Y1	X	Y2	Y2
Cont. G.	Y1	O	Y2	Y2

3.1. Participants

The initial pool of population for the present study included 56 learners taking conversation course at Farzan Language Institute in Rasht, Iran. Having the test of homogeneity run, a sample of 40 participants at the intermediate level of language proficiency were chosen. They were between the age range of 19 and 26. All the them were female native speakers of Persian. They were selected from intact classes and randomly divided into two groups, each of which included 20 participants; one was considered as an experimental group and the other as a control group.

3.2. Materials

The materials used for the purpose of this study were as follows: Quick Placement Test (QPT), pretest, posttest, and Tiny Cards app in mobile phones.

3.2.1. Quick Placement Test

Prior to starting the treatment, the participants were required to take QPT to make that they were homogeneous with respect to their proficiency in language skills as a whole. As language proficiency level was founded crucial in influencing the effect of the treatment, the test chosen for this study was QPT, which is designed to place respondents in the appropriate level, and also to test their general language ability.

3.2.2. Pretest, Posttest, and Delayed Posttest

The test materials used in the present study for both groups were chosen from American English File 3 (Latham-Koenig *et al.*, 2008) that was used as the main course book in the English Language Institute. Since the goal was to investigate the effects of Tiny Cards app on vocabulary, 30 vocabulary items in multiple-choice format were chosen for the pretest. Since improvement from the pretest to the posttest indicated how much was learned as a result of introducing the intervention program, vocabulary items with the same level of difficulty were taken by the participants in the posttest. The posttest of vocabulary was to serve two purposes: to see whether experimental group would outperform the control group and to see if there was a statistically significant difference in the performance of the participants in both groups from the pretest to the posttest. In addition, as the measurement of the retention of vocabulary was the goal in the present study, the other set of vocabulary items with the same level of difficulty as used in the posttest was given to the participants two weeks after administering the posttest.

3.2.3. Tiny Cards App

In order to explore the potential improvement of the participants' vocabulary knowledge both on learning and retention level, Tiny Cards app was used. It is a fun flashcards app by Duolingo that was named one of Apple's top 10 best apps of 2016, and selected as the 2016 mobile app of the year by Product Hunt. It is also one of the few free language learning apps that offer practical lessons in a variety of languages. It includes more than 200,000 custom flashcard decks on topics ranging from geography and art history to the anatomy of Pokémon, and one can contribute decks oneself if he cannot find a deck pertaining to the topic he is trying to learn about. Participants can use it to memorize vocabulary, study for tests, and learn the capitals of Europe.

3.3. Procedures for Data Collection and Analysis

To accomplish the aim of the study, the following procedures were pursued. Firstly, for selecting the participants, QPT was administered to 56 learners, and 40 participants of the study at the intermediate level of language proficiency according to the standards and criterion scores were homogeneously selected. They were divided in two groups of 20 participants as the control group and the experimental group. Then, the pretest of vocabulary was conducted both to measure the participants' vocabulary knowledge and to check the homogeneity of the groups at the beginning of the treatment. Next, the participants in the experimental group were assigned to receive treatment on their vocabulary knowledge via Tiny Cards app. The learners attended the class for eight sessions, twice a week for 40 minutes of the class time, and in each session they were taught one set of vocabulary items through the app. In addition, the participants were told to install the application via Play Store. Then, they were told how to use it. Figure 1 illustrates the initial pages of the Tiny Card app, the start page, and a sample lesson.

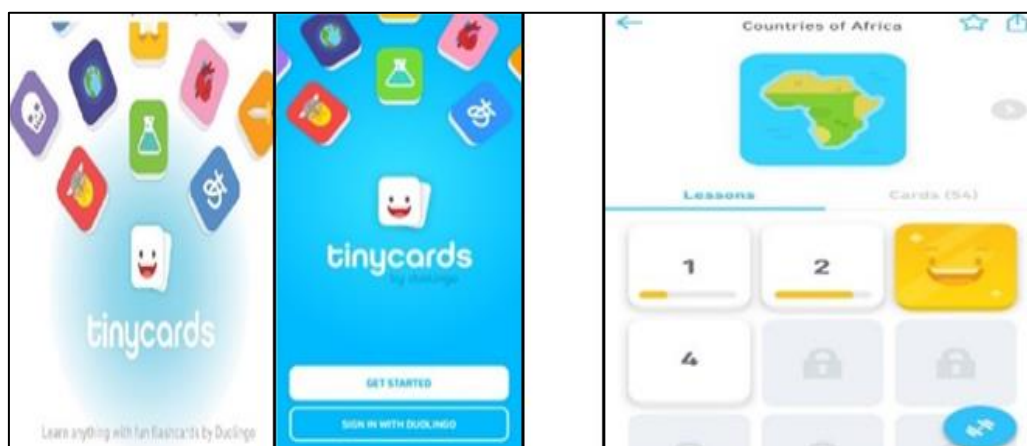


Figure-1. Sample pages of Tiny Cards app

The app already featured hundreds of beautifully illustrated decks. They were recommended to use the available decks or create their own ones. Since creating a new deck required to undergo email processing and making passwords, they preferably used the available decks. Figure 2 shows a sample of decks available present for participants or making new decks via email registry.

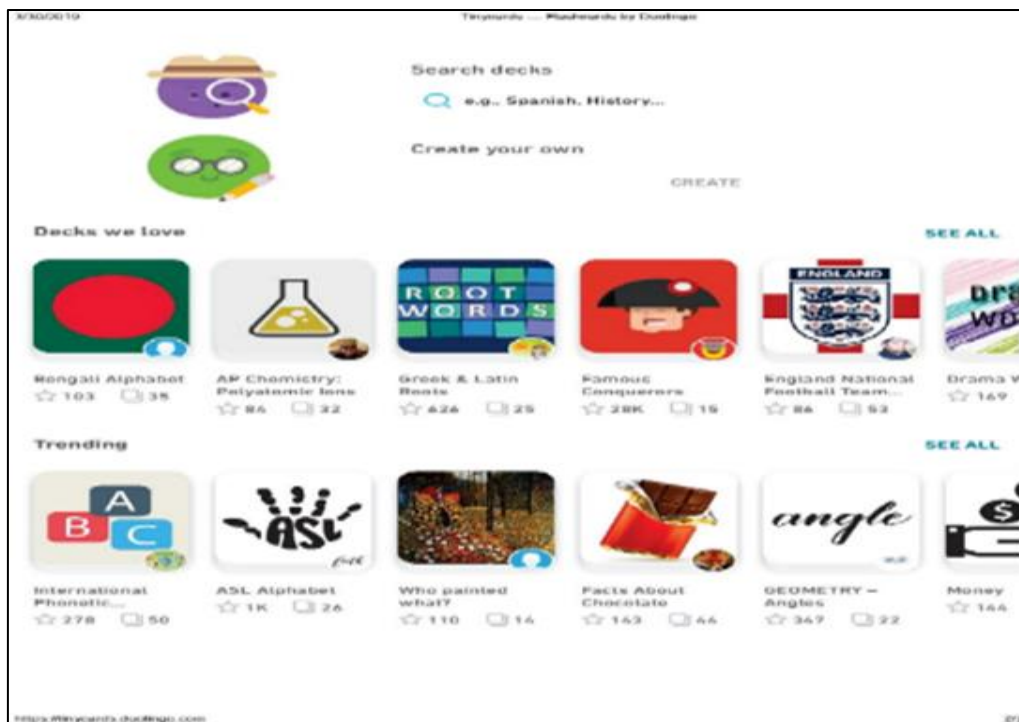


Figure-2. A sample of decks of Tiny Cards

The participants could see and practice all the all the vocabulary items in one or some decks they generally liked to learn and practice. In addition, Tiny Cards gamifies the learning experiences. Users can unlock new levels and share cards with friends. On the other hand, the control group did not receive any treatment except the teacher’s teaching of the course book with no other special treatment. Having finished the treatment, the posttest was administered to measure the participants’ vocabulary knowledge at the end of the treatment and also to gauge their performance scores in comparison to the pretest. However, to know the degree of retaining the vocabulary learned as the result of treatment designated in the posttest, a delayed posttest was also taken by the participants. This test served to show the amount of retention of the items of vocabulary. The data analysis of this study was based on both descriptive and inferential statistics. All the statistical analyses were done by the use of SPSS. All the procedures followed for data collection are represented in Figure 3.

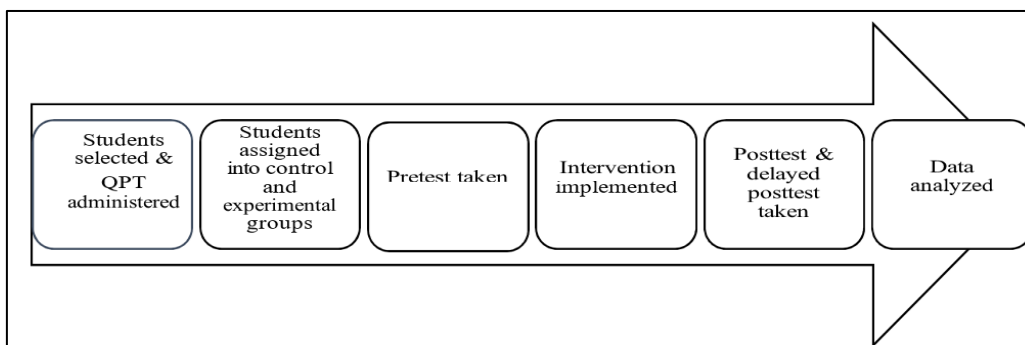


Figure-3. Procedures for data collection

4. Results and Discussion

4.1. Vocabulary Pretest

After selecting the homogenous participants, they were divided into two groups (control and experimental), and after estimating the reliability of the pretest, the participants were given a vocabulary test to examine the possible initial differences between the two groups regarding their vocabulary knowledge. Table 2 shows the group statistics of the scores reached on the pretest of vocabulary for both the control and experimental groups.

Table-2. Group Statistics for Control and Experimental Groups’ Pretest

Pretest scores	Groups	N	Mean	Std. Deviation	Std. Error Mean
Vocabulary	Control	20	12.60	6.51	1.18
	Experimental	20	12.50	5.43	0.99

For the vocabulary test administered at the beginning of the study, the mean scores for the control and experimental groups were 12.60 and 12.50, respectively. The degree of scatteredness of the scores for the experimental group was slightly smaller than that of the control group ($SD_{\text{experimental group}} = 5.43$, $SD_{\text{control group}} = 6.51$). Table 3 shows the results of an independent-samples t-test used to make an analysis of the learners’ scores on

the pretest. The independent-samples t-test was conducted to compare the performance on the pretest of vocabulary for the two groups. The independent-samples t-test presented the results of Levene’s test for the equality of variances which tested whether the variances of scores for the two groups were the same for the vocabulary test.

Table-3. Independent-samples T-test on the Scores of Pretests

		Levene's test for equality of variances				t-test for equality of means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Dif.	Std. Er. Dif.	95% Confidence Interval of the Diff.	
								Lower	Upper	
Vocabulary pretest	Equal variances assumed	.24	.62	.36	38	.715	.20	.54	-.89	1.29
	Equal variances not assumed			.36	37.6	.715	.20	.54	-.89	1.29

Based on Table 3, there was not a statistically significant difference between the mean scores of the two groups in the vocabulary pretest ($p > 0.05$). That is, the control and experimental groups were almost at the same level of proficiency in terms of their vocabulary ability in the pretest administered at the beginning of the study. For the pretest of vocabulary, there was not a statistically significant difference in scores for the control group ($M = 12.60$, $SD = 6.51$) and experimental group ($M = 12.50$, $SD = 5.43$). In other words, the two groups were approximately at the same level of proficiency in terms of their vocabulary ability in the pretest.

4.2. Vocabulary Posttest

Table 4 depicts the values of the means and standard deviations along with standard error of means for the two groups on the posttest of vocabulary.

Table-4. Group Statistics for Control and Experimental Groups' Posttest

Groups	N	Mean	Std. Deviation	Std. Error Mean
vocabulary control	20	13.90	6.20	1.13
Experimental	20	20.56	6.40	1.16

Based on Table 4, the mean score of the experimental group ($\text{mean}_{\text{experimental group}} = 20.56$) was (6.66) points higher than that of the control group ($\text{mean}_{\text{control group}} = 13.90$) in vocabulary test. Moreover, the standard deviations for the two groups were nearly the same ($SD_{\text{experimental group}} = 6.40$, $SD_{\text{control group}} = 6.20$). Calculating the possible effect of treatment on the dependent variable of vocabulary knowledge of the learners, an independent-samples t-test was run to show the results of the posttest of vocabulary. It was implemented to make a comparison between the experimental and control groups in terms of their performance after supplying the specific treatment for the experimental groups.

An independent-samples t-test was conducted to compare the posttest scores for the control and experimental groups for vocabulary test. As Table 5 indicates, there is a statistically significant difference in scores for control group ($M = 13.90$, $SD = 6.20$) and experimental group ($M = 20.56$, $SD = 6.40$). In other words, the two groups were significantly different in terms of their vocabulary knowledge in the posttest.

Table-5. Independent-samples T-test on the Scores of Posttests of Vocabulary

		Levene's test for equality of variances				t-test for equality of means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Dif.	Std. Er. Dif.	95% Confidence Interval of the Diff.	
								Lower	Upper	
Vocabulary posttest	Equal variances assumed	.35	.55	-4.77	58	.00	-7.76	1.62	-11.02	-4.50
	Equal variances not assumed			-4.77	57.93	.00	-7.76	1.62	-11.02	-4.50

4.3. Paired-Samples T-test

In order to investigate the learners’ progress within groups, a paired-samples t-test was also run, which showed the learners’ progress from the pretest to the posttest presented in Table 6.

Table-6. Paired-samples T-test Statistics for Vocabulary Test

Groups			Mean	N	Std. Deviation	Std. Error Mean
Vocabulary	Control group	Pair 1 Pretest scores	12.60	20	6.51	1.188
		Pair 1 Posttest scores	13.90	20	6.20	1.131
	Experimental group	Pair 1 Pretest scores	12.50	20	5.43	.991
		Pair 1 Posttest scores	20.56	20	6.40	1.169

The mean score of the control group for the vocabulary test improved from (M = 12.60) in the pretest to (13.90) in the posttest; that of the experimental group progressed from (M = 12.50) in the pretest to (20.56) in the posttest. As shown in Table 6, based on the results of the paired-samples t-test, both the control and experimental groups proceeded in the posttest. However, this improvement was statistically significant simply for the experimental group but not for the control group ($\rho_{\text{experimental group}} < .05, \rho_{\text{control group}} \geq .05$). In other words, the experimental group made a noticeably higher progression as compared to the control group in the posttest of vocabulary. Inferentially, to investigate the amount of learners’ progress within groups, a set of paired-samples t-test was also administered to the control and experimental groups’ pretest and posttest.

A paired-samples t-test was run to compare the scores of the pretest and the posttest of learners in the control and experimental groups. As displayed in Table 7, the mean difference of -8.06 between the experimental learners’ test scores from the pretest to the posttest was statistically significant. This indicates that the learners boosted their vocabulary to a statistically significant degree as they received instruction using Tiny Card app.

Table-7. Paired-samples T-test, the Pretest and Posttest Scores

		Paired Differences					T	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre. Exp.	-8.06	2.638	.625	-8.258	.0487	-1.658	11	.05
	Post. Exp.								
Pair 2	Pre. Cont.	-1.3	3.258	.726	-4.254	2.735	-5.254	11	.00
	Post. Cont.								

4.4. Delayed Posttest

To compare the performance of the groups in their posttest and delayed posttest of vocabulary, the mean differences in the tests were estimated through an independent t-test. Table 8 reveals the data collected on the descriptive statistics for the performances of the groups on their delayed posttest.

Table 8 indicates that the mean differences of tests are significant at $\rho < .001$. As it can be noted, there is a lower performance of the groups in their delayed posttest as the means for the tests in the immediate and delayed posttests show. As observed, the mean score (20.00) of the experimental group is higher than the mean score of the control group revealing that learners in the experimental group had a better performance than the learners in the control group. The analysis show that although the retention of vocabulary was not the same size as the posttest taken two weeks before, the learners in the experimental group were able to retain most of the vocabulary they had gained through the instruction given to them via Tiny Cards app. To understand whether the performance of the groups was significantly different in their delayed posttest, an independent-samples t-test was run.

Table-8. The Group Statistics for Control and Experimental Groups’ Delayed Posttest of Vocabulary

Groups	N	Mean	Std. Deviation	Std. Error Mean
Vocabulary Control	20	12.80	5.10	0.89
Experimental	20	20.00	5.89	0.78

As Table 9 indicates, since the value in the Sig. (2-tailed) column was less than (.05), there was a statistically significant difference in the mean scores on the dependent variable (delayed posttest scores of vocabulary) for the two groups. For the posttest of speaking, there was a significant difference in scores for the control (M = 12.80, SD = 5.10) and experimental group (M = 20.00, SD = 5.89). The magnitude of the differences in the means was small; therefore, the learners in the experimental group could retain their vocabulary knowledge to a high extent.

Table-9. Independent-amples T-test of the Delayed Posttests of Vocabulary for Experimental and Control Groups

	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
Delay									
Equal Variances assumed	.25	.61	-2.70	38	.010	-.95	35	1.66	-.23
Equal Variances not assumed			-2.70	37.8 8	.010	-.95	35	1.66	-.23

The independent-samples t-test procedure presented two tests of the contrast between the control and experimental groups. In addition, a paired-samples t-test was run to compare and contrast the progression of learners in vocabulary within the groups. The results of independent-samples t-test for the posttest of vocabulary (Table 5) showed that there was a significant difference between the two groups in their performance on the posttest of vocabulary (sig = .00, $\rho \leq .05$). According to the findings, although the two group were homogenous in terms of their vocabulary at the beginning of the study, the experimental group outperformed significantly the control group. Concerning the first null hypothesis stating that MALL using Tiny Cards app does not have any statistically significant effect on Iranian intermediate EFL learners' vocabulary learning, an independent-samples t-test was run to the results of the posttest. The results showed that providing vocabulary instruction through Tiny Cards app affected the performance on the vocabulary knowledge of the experimental group. In fact, the learners' performance in the experimental groups (M = 20.56) far outweighed that of the control groups (M = 13.90) in the posttest of vocabulary. Thus, the first null hypothesis was rejected implying that vocabulary instruction through Tiny Cards app has statistically significant effects on EFL learners' vocabulary knowledge. With regard to the second null hypothesis that said "MALL using Tiny Cards app does not have any statistically significant effect on Iranian intermediate EFL learners' vocabulary retention", the results showed a statistically significant effect on vocabulary retention among Iranian EFL learners. Therefore, the second null hypothesis was also rejected.

Overall, the finding of the current study for the immediate posttest showed higher gains of vocabulary in the experimental group who received vocabulary instruction via Tiny Cards app in MALL setting. They further confirm those of some other studies in terms of the use of MALL in the language learning (Basoglu and Akdemir, 2010; Suwantarathip and Orawiwatnakul, 2015). This study also supported the advantages of using technological devices such as mobile phones in language classes. It was found that MALL application helped the participants to a high extent as the findings of this study showed that the participants who used technology (mobile phone) to learn, gained more vocabulary due to availability of the materials as pictorial and vocal annotations. This is what took place in the present study in which learners in the experimental group who used mobile application outperformed the learners who received instruction through conventional method of no technology use or mobile application.

Likewise, the study done by Nikoopour and Kazemi (2014) on the advanced EFL learners' gain of vocabulary in two distinct situations also supports the findings of the present study because in their study those learners who received instruction through mobile flashcards outperformed the learners who were taught vocabulary via paper flashcards. Thus using digital flashcards applied in MALL situation proved more effective than paper flashcards. These studies show that MALL can be considered as beneficial for all learners, since almost every L2 learner has a mobile device today, and as a result of this, mobile devices may offer equal opportunities to L2 learners. Having these in mind, it is possible to say that mobile activities should be improved to cover the four language skills plus grammar, pronunciation and especially vocabulary learning.

5. Conclusion

As mentioned before, this study tried to find answers to whether MALL using Tiny Cards app has any statistically significant effect on Iranian intermediate EFL learners' vocabulary learning and retention or not. In conclusion, the outcomes indicated the effectiveness of Tiny Cards App on Iranian intermediate EFL learners' vocabulary learning and retention. The results showed that the participants who worked with Tiny Cards App were at privilege compared to their control group counterparts. Therefore, using the smartphone applications that are already well-functioning and popular among users could facilitate the mobile learning practices considerably. Since learning English is very popular in non-English speaking countries, developing modern assisted-learning tools that support effective English learning is a critical issue in the English-language education field. In short, Mobile learning is undergoing rapid evolution, and mobile devices are developing towards becoming tools for education and language learning. Mobile technologies clearly offer numerous practical uses in language learning. In order to make the best of mobile devices in learning environments, the use of these devices should be clarified; that is, attention should be accorded to the pedagogical aspects of the process rather than the technological parts. This is a reaction to the focus on technology rather than pedagogy in education. Moreover, the advantage of using mobile phones and mobile applications in teaching vocabulary is becoming an opportunity to learn beyond classroom borders. As a conclusion, instructional activities should not be limited to a set place but can be conducted anywhere and anytime and learners can engage, often asynchronously, with teachers, learning resources and other learners.

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