Vocabulary Retention of EFL Learners through the Application of ANKI, WhatsApp and Traditional Method

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Abstract

With the advancement of technology and its role in making life more convenient, some EFL teachers prefer to use it in their classrooms. In view of this, the current study aimed to explore the effect of Anki and WhatsApp on the vocabulary retention of Iranian EFL learners. The study's design was quasi-experimental with three groups of WhatsApp-based vocabulary instruction, Anki-based vocabulary instruction and the traditional one. Sixty EFL learners studying English in a language institute participated in the study, and were divided into three groups of twenty. To ensure their homogeneity, a Solution Placement Test was given to them. After the treatment, the post-test was given to them to check their vocabulary retention. The results of the repeated measures ANOVA indicated that Anki-based and WhatsApp-based vocabulary instruction were effective in enhancing their vocabulary retention. The results of MANOVA showed that there were significant differences among the three groups in their vocabulary retention.

Keywords: ANKI; Mobile Applications; Technology-Based Language Learning; Vocabulary Retention; WhatsApp

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1. Introduction

One of the essential elements in the second language (L2) acquisition and foreign language learning is vocabulary knowledge. Words are the building blocks of language learning, and therefore, vocabulary is a significant part of acquiring a foreign language (Francis & Simpson, 2009; Nation, 2001). Students can enhance their listening, speaking, reading and writing by learning new words, in this way, they can also improve their comprehension and their production in L2. Students' vocabulary knowledge can be enhanced formally through textbooks and informally through communication with others. Theoretical foundations of empirical studies emphasize effective vocabulary acquisition in both first and second language (Hairrell et al., 2011; Nagy & Scott, 2001). However, in the English as a Foreign Language (EFL) setting, students have more difficulty improving their vocabulary knowledge because of the lack of face-to-face access to native speakers and limited access to authentic media and materials.

To improve the general and academic vocabulary of EFL students, language teachers can devise and utilize a variety of instructional strategies. With the many advancements in technology and its role in making life more convenient and faster, everyone has a mobile in his hand and some prefer to use its applications in the best ways. As Hockly (2013) stated, "teachers' teaching practices is affected by the future trends since it is increasingly mobile" (p. 83). Among all practical applications in mobile phones, WhatsApp as a smartphone application operating on almost all current types of devices and systems has gained popularity in different aspects of language learning (Bouhnik & Deshen, 2014). Today, the consumers have opportunities to communicate virtually via WhatsApp messenger to share their experiences with other users just by clicking a button. It helps its users send text, voice and video messages to their peers and allows them to find a great deal of information quickly (Cohavi, 2013).

There exists a lack of empirical studies in the realm of social media and their effects on language learning (Golonka, 2012). Furthermore, one of the fundamental problems that EFL learners have almost always encountered is the retention of vocabulary. They are asking teachers and seeking strategies to learn them easily. Thousands of free applications which can be run exclusively on mobile devices have been designed to help learners individualize their immediate learning (Khodabandeh, 2020). The present study aimed to identify the effects of using apps on vocabulary retention of intermediate English language learners. The following research questions were raised to address the purpose of the study:

1. To what extent does vocabulary instruction through ANKI application have any significant effect on improving EFL learners' learning and retention of vocabulary?

2. To what extent does vocabulary instruction through WhatsApp have any significant effect on improving EFL learners' learning and retention of vocabulary?

3. Are there any significant differences between learning vocabulary through applications vs. traditional methods?

2. Review of the Literature

2.1. Empirical Studies of Vocabulary Learning through Applications

In a study by Wang et al. (2015), the students who received instruction through iPad improved more than the control group and showed a positive attitude in using it. Similarly, Habbash (2015), Saidouni and Bahloul (2016) investigated EFL students and teachers' attitudes toward using mobile devices for learning and teaching vocabulary and revealed that both teachers and EFL learners had positive attitudes toward them. Basal et al. (2016) investigated the effectiveness of an app on teaching English idioms compared to traditional activities and confirmed that the experimental group performed significantly better than the other group who did not use the app. Likewise, an experimental study was conducted by Ghaemi and Golshan (2017) to examine the use of WhatsApp on teaching vocabularies among EFL learners and their results indicated that the use of social media such as WhatsApp had a significantly positive effect on the participants' vocabulary learning. Cavus and Ibrahim (2009), Kennedy and Levy (2008), and Lu (2008) believe that learners' opportunities can be extended by mobile technology in meaningful ways. As Kukulska-Hulme (2008) stated, the use of apps has an impact on learners' learning in many disciplines and contexts. Likewise, Muhammed (2014) confirmed that the use of mobiles has a significant influence on language learning. Hayati et al., (2011) showed that using apps and teaching through them could be considered an effective medium for teaching and learning English vocabularies. In addition, Zhang et al. (2011) found that the group learning through mobile phone SMS text messages performed better than the control group. In the same case, the effects of SMS on 40 Iranian EFL learners' performance on vocabulary retention and reading comprehension were examined by Motallebzadeh and Ganjali (2011) and the results confirmed that the mobile phone users outperformed the control group. Overall, the review of different studies provided sufficient evidence for the significant role of social networking and application technology in vocabulary learning in terms of its genesis and in presenting the landmark studies that defined the field. They showed that when social networking and technology are blended in language learning instruments, they help second/foreign language learners promote their proficiency in different areas of language learning. Also, a number of studies have demonstrated that social networking and technology, as a teaching technique in language classroom, contribute to developing language learners' language proficiency and motivation

(Khodabandeh & Naseri, 2020). Very scarce studies have compared the role of social networking, technology-enhanced and traditional techniques in vocabulary learning.

3. Methodology

3.1. The Design of the Study

A quasi-experimental research method and a pre-test-post-test design were employed to run this study. Three groups of students, two experimental groups which received the treatment and one control group which received conventional methods participated in the study. The independent variable was learners' use of vocabulary through WhatsApp and the dependent variable was learners' vocabulary retention.

3.2. Participants

Sixty EFL learners were selected based on their performance on the English language proficiency test, i.e., the Solution Placement Test. They were studying at Zabansara English language institute in Isfahan, and were randomly assigned to three groups of WhatsApp-based vocabulary instruction, Anki-based vocabulary instruction and traditional. Their age range was between 16 to 22.

3.3. Instruments

The instruments for the present study were the Solutions Placement Test, the pre-test and the post-test.

3.3.1. Solution Placement Test

The Solution Placement Test (Edwards, 2007) was used to homogenize the participants and also determine their knowledge of grammar and vocabulary. The test includes 70 questions, including reading, writing, and language use items.

3.3.2. Pre-test and Post-test

A 20-item multiple-choice vocabulary test was given to the participants before and after the treatment of study as the pre-test and the post-test. The test was based on the participants' course book. To check the reliability of the pre and post-test, they were pilot studied on 15 EFL students. The reliability of the tests was run by Cronbach's alpha analysis and the results ($r = 0.83$) showed that the tests were reliable. Regarding the content validity of the test, the tests were confirmed by two English language teachers.

3.4. Procedure

In the Anki-based vocabulary instruction group, the researcher tried to clarify the goals of each unit for about five minutes before starting it. The purpose of this section, which was titled as goals, was to tell the students what they were going to learn in each chapter. The Anki lets the learners make their own flashcards, on any device. Creating flashcards is as easy as typing the words on the front and back of each card. The Anki works through spaced repetition, that means that it shows the flashcards to the learners before they forget them. The goal of spaced repetition is to help students to build long-term knowledge without committing to memory. In addition, the learners could add images and sound to their flashcards. Therefore, the students can listen how to say the words they have to learn and read the words with transcription below. The pictures for the lexical flashcards help the students to remember the words better. This is a progressive alternative to putting the words down in the book. After, clarifying the goals, the researcher set up to present the new vocabulary through its spelling and pronunciation, examples, illustrations, context, and so on. Vocabulary section within each chapter, the vocabulary section or screen introduced items in English before starting the new chapter. The vocabulary section includes the list of vocabulary items, the related pictures and appropriate words, word searches, finding the right word, and classifying the words with related topics. The purpose of instruction included presenting the new vocabulary before starting the new lesson to enhance their comprehension. To present and practice the latest vocabularies the researcher went through the above-mentioned activities. They followed her and could see the spelling, hear the pronunciation, and see the related drawing under the list. She provided the learners with any necessary explanations.

The study used WhatsApp which was the tool for sending and receiving feedback for the second experimental group. The participants could download and install this application on their computer or laptop and if most of them had a cell phone, they could install it on their cell phones. The participants preferred the smartphone due to its accessibility. Then, the teacher and students worked on it by sending their voice as a podcast about the words, synonyms and antonyms. The researcher created a WhatsApp group and all the participants of the second experimental group were added to the group. They received the teaching material, feedback through the WhatsApp. Thirty vocabularies in different parts of speech namely, ten adjectives, ten verbs and ten adverbs were selected by the researchers. Each vocabulary was accompanied by a picture. The participants in this group were asked to be online at 4:30 p.m. every other day for six days. The researcher then shared five texts with some bolded vocabulary and then she explained the words' meaning, definition, and collocation if it had any. Then students were asked to raise their questions if they had any. Following that, the researcher shared ten related questions for the students to answer; the purpose behind this was to make sure about students' learning of the target words. The targeted words'

definition, parts of speech and collocation were explained by the researcher. The learners had to make a deck for each category of vocabulary and put the word under the right category. In the first session, the researcher, as an instructor herself, gave a full explanation about the course and its expected process. In addition, the way learners could podcast was shown in the WhatsApp group. Moreover, the scheduled activities were explained and the participants' questions about the course and whatever they were expected to do were answered. The learners had better not to know anything about the current study which is participating in research. By choosing the experimental group, the treatment presented in a class and after that as an authentic activity, they supposed to practice vocabulary in WhatsApp as an online application at home. In this research study, the teacher used vocabulary activities in the form of discussion to increase students' vocabulary knowledge and use it in a natural communicative way. Each lesson was taught in the WhatsApp group in detail. In addition, they could get teachers' feedback or the learners' feedback to find their errors or mistakes and try to correct them and learn the vocabulary items in this way.

The control group received vocabulary instruction through the conventional method. Vocabulary instruction was provided according to usual teaching techniques such as using flashcards, presenting tasks, providing synonyms and antonyms, paraphrasing, sentence making, looking up in dictionary, explicit description and giving definitions.

At the end of the treatment sessions, all participants of the three groups took the identical post-test. Six days later, the second post-test was administered to measure the participants' retention of vocabularies.

4. Results

To test the scores of the participants on the primary tests of the study, a one-sample Kolmogorov-Smirnov test was conducted.

Table 1.

Normal distribution Kolmogorov-Smirnov test

		Solutions Placement Test
N		60
Normal Parameters[a,b]	Mean	41.92
	Std. Deviation	9.639
Most Extreme Differences	Absolute	.187
	Positive	.113
	Negative	-.187
Kolmogorov-Smirnov Z		1.448
Asymp. Sig. (2-tailed)		.130

According to the Table 1, the measured significance level for Solution Placement Test scores were higher than the assumed level of significance (i.e., 0.05), so the scores are normally distributed.

Table 2 shows the descriptive statistics of participants' performance on pre-test.

Table 2.

Descriptive statistics of the participants' scores on the pre-test

	N	Minimum	Maximum	Mean	Std. Deviation
Pre-test (Traditional Group)	20	4.00	12.00	7.9500	2.23548
Pre-test (ANKI Group)	20	3.00	13.00	7.7500	2.78860
Pre-test (WhatsApp Group)	20	4.00	12.00	7.6000	2.18608

A one-way ANOVA was performed among the pre-test scores of the three groups.

Table 3.

ANOVA on the pre-test

Pre-test

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.433	2	.217	.035	.966
Within Groups	355.500	57	6.237		
Total	355.933	59			

According to Table 3, there is not any significant difference ($F = .03$, $p > 05$) among the pre-test scores of the three groups.

Table 4 shows the descriptive statistics of the three groups on the post-test.

Table 4.

Descriptive statistics of participants' performance on the post-test

	N	Minimum	Maximum	Mean	Std. Deviation
Post-test (ANKI Group)	20	12.00	20.00	16.3500	2.51888
Post-test (WhatsApp Group)	20	10.00	19.00	14.0500	2.94645
Post-test (Traditional Group)	20	7.00	14.00	9.30000	2.40832

The mean of ANKI, WhatsApp and traditional groups on the post-test was16.35, 14.05, and 10.90 respectively. Six days after the post-test, the delayed post-test was administered. The results are shown in Table 5.

Table 5.

Descriptive statistics of the participants' performance on delayed post-test

	N	Minimum	Maximum	Mean	Std. Deviation
Delayed Post-test (ANKI Group)	20	10.00	18.00	15.7000	2.49420

Delayed Post-test (WhatsApp Group)	20	9.00	18.00	12.8500	2.49789
Delayed Post-test (Traditional Group)	20	6.00	12.00	8.8000	1.82382

Repeated measures ANOVA was performed among the scores of the participants of the ANKI group on pre-test, immediate and delayed post-test.

Table 6.

Tests of Within-Subjects Effects on pre-test, immediate and delayed post-tests of ANKI group

Measure: ANKI						
Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Test	Sphericity Assumed	917.233	2	458.617	67.697	.000	.781
	Greenhouse-Geisser	917.233	1.911	479.951	67.697	.000	.781
	Huynh-Feldt	917.233	2.000	458.617	67.697	.000	.781

	Lower-bound	917.233	1.000	917.233	67.697	.000	.781
Error(Test)	Sphericity Assumed	257.433	38	6.775			
	Greenhouse-Geisser	257.433	36.311	7.090			
	Huynh-Feldt	257.433	38.000	6.775			
	Lower-bound	**257.433**	**19.000**	**13.549**			

According to the results, the tests differed statistically significantly among pre-test, immediate, and delayed post-test ($F_{1.91, 36.31} = 67.69$, $p < .05$). Bonferroni post-hoc test was performed to detect the location of differences in pre-test, immediate and delayed post-test of ANKI group. The results are shown in Table 7.

Table 7

Bonferroni post-hoc test on pre-test, immediate and delayed post-tests of ANKI group

Pairwise Comparisons

Measure: ANKI						
(I) Test	**(J) Test**	**Mean Difference (I-J)**	**Std. Error**	**Sig.[b]**	**95% Confidence Interval for Difference[b]**	
					Lower Bound	**Upper Bound**

1	2	-8.600*	.741	.000	-10.546	-6.654
	3	-7.950*	.896	.000	-10.302	-5.598
2	1	8.600*	.741	.000	6.654	10.546
	3	.650	.825	1.000	-1.515	2.815
3	1	7.950*	.896	.000	5.598	10.302
	2	-.650	.825	1.000	-2.815	1.515

According to the results of table 7, there is a significant difference between pre-test and immediate and delayed post-test. In other words, the participants' use of ANKI application significantly enhanced their vocabulary retention.

A repeated measures ANOVA was performed between the scores of the participants of the WhatsApp group on pre-test, immediate and delayed post-test.

Table 8.

Tests of Within-Subjects Effects on pre-test, immediate and delayed post-tests of WhatsApp group

Tests of Within-Subjects Effects

Measure: WhatsApp						
Source	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**	**Partial Eta**

							Squared
Test	Sphericity Assumed	470.700		235.350	41.156	.000	.684
	Greenhouse-Geisser	470.700	.976	238.235	41.156	.000	.684
	Huynh-Feldt	470.700	.000	235.350	41.156	.000	.684
	Lower-bound	470.700	.000	470.700	41.156	.000	.684
Error (Test)	Sphericity Assumed	217.300	8	5.718			
	Greenhouse-Geisser	217.300	7.540	5.789			
	Huynh-Feldt	217.300	8.000	5.718			
	Lower-bound	217.300	9.000	11.437			

According to the Table 8, the repeated measures ANOVA determined that the mean of the tests differed statistically significantly among pre-test, immediate,

and delayed post-test ($F_{1.97,\ 37.54} = 41.15$, $p < .05$). Bonferroni post hoc test was performed to detect the location of differences in the pre-test, immediate and delayed post-test of the WhatsApp group.

Table 9.

Bonferroni post-hoc test on pre-test, immediate and delayed post-test of the WhatsApp group

Pairwise Comparisons

Measure: WhatsApp						
(I) Test	(J) Test	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
1	2	-6.450[*]	.731	.000	-8.368	-4.532
	3	-5.250[*]	.739	.000	-7.191	-3.309
2	1	6.450[*]	.731	.000	4.532	8.368
	3	1.200	.797	.445	-.891	3.291
3	1	5.250[*]	.739	.000	3.309	7.191
	2	-1.200	.797	.445	-3.291	.891

Table 9 shows that there is a significant difference between the pre-test and both immediate and delayed post-tests but there is not any significant difference between immediate and delayed post-test.

To detect whether using traditional method of vocabulary significantly improve EFL learners' retention of vocabulary, a repeated measures ANOVA was performed between the scores of the participants of the traditional group on pre-test, immediate post-test and delayed post-test.

Table 10.

Tests of Within-Subjects Effects on pre-test, immediate and delayed post-tests of traditional group

Tests of Within-Subjects Effects

Measure: Traditional							
Source		**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**	**Partial Eta Squared**
Test	Sphericity Assumed	18.633	2	9.317	2.641	.084	.122
	Greenhouse-Geisser	18.633	1.662	11.212	2.641	.096	.122
	Huynh-Feldt	18.633	1.802		2.641	.091	.122
	Lower-bound	18.633	1.000	18.633	2.641	.121	.122
Error	Sphericity Assumed	134.033	38	3.527			

(Test)				
Greenhouse-Geisser	134.033	31.577	4.245	
Huynh-Feldt	134.033	34.234	3.915	
Lower-bound	**134.033**	**19.000**	**7.054**	

The repeated measures ANOVA determined that the mean of the tests did not differ statistically significantly among the pre-tests, immediate, and delayed post-tests ($F_{1.66, 31.57} = 2.64$, $p > .05$). In other words, the conventional vocabulary instruction was not successful in improving the control group participants' vocabulary retention.

To find whether there are any significant differences between learning vocabulary through applications vs. traditional methods, a one-way MANOVA was performed between the scores of ANKI, WhatsApp and traditional groups on the pre-test, immediate and delayed post-test.

Table 11.

One-way MANOVA on pre-test, immediate and delayed post-test of ANKI, WhatsApp and traditional groups

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.915	199.775[b]	2.000	37.000	.000
	Wilks' Lambda	.085	199.775[b]	2.000	37.000	.000

	Hotelling's Trace	10.799	199.775[b]	2.000	37.000	.000
	Roy's Largest Root	10.799	199.775[b]	2.000	37.000	.000
immediate delayed	Pillai's Trace	.003	2.64[b]	2.000	37.000	.008
	Wilks' Lambda	.997	2.64[b]	2.000	37.000	.008
	Hotelling's Trace	.003	2.64[b]	2.000	37.000	.008
	Roy's Largest Root	.	2.64[b]	2.000	37.000	.008

According to the results, there are significant differences among the participants of ANKI, WhatsApp and traditional groups, in developing their vocabulary retention.

5. Discussion

This study investigated the effectiveness of mobile applications via Anki and WhatsApp on improving EFL learners' vocabulary learning. The results support those of Basal et al. (2016); Ghaemi and Golshan (2017) who revealed that mobile applications help learners improve their vocabulary. The results confirm those of Chachil et al. (2015) and Muhammed (2014) who showed that mobiles have a significant influence on language learning of EFL learners. In addition, the findings confirm those of Mahmoud (2013) who revealed that the writing and speaking performance of those who practiced SMS with their teachers observably improved. The results of the present study also support those of Tawiah et al. (2014) who revealed that WhatsApp application has significant influence on EFL

learners' language learning. The results are in line with those of Motallebzadeh and Ganjali (2011), and Burmark (2004) who confirmed that mobile phone users outperformed the control group, as social networking applications let learners create and merge visual images of vocabularies with the texts.

The findings revealed that the participants who used mobile phone programs obtained more vocabulary than those who used conventional method. In addition, the results showed that the experimental groups who applied flashcards on their mobile phones scored considerably better than the control group who used flashcards on paper. Also the results show that mobile devices play considerable role in vocabulary improvement because they have the ability to interest students and to establish new learning circumstances (Naseri & Khodabandeh, 2019).

6. Conclusion

This study investigated the effectiveness of mobile applications via Anki and WhatsApp on improving Iranian English as a foreign language (EFL) learners' vocabulary learning. According to the results, the integration of technology such as Anki and WhatsApp in vocabulary learning improved the vocabulary retention of the experimental groups. So, the importance of technology in education has been confirmed. The findings of this study suggested that using new mobile-based and internet-based applications, i.e. WhatsApp and Anki, provided better opportunities for EFL learners to learn vocabulary. The better performance of the experimental groups may refer to the fact that they had more interactions with their peers (Khodabndeh, 2021), so the integration of the learners' interaction as well as their use of technology contributed their improvement in vocabulary learning (Asadi et al., 2019).

Although the present study has successfully demonstrated the positive effect of mobile phone applications, it has a number of limitations that need to be noted cautiously. This study worked on the impact of mobile applications on vocabulary learning of Iranian EFL learners. There can be other studies working on other skills and sub-skills. Mobile applications need a lot more research in the field of language learning especially in Iran. There are many variables that need to be taken into consideration in choosing the right mobile applications like gender and personality. EFL learners need more contexts for easier and more accurate learning of English and computer games can be one of the essential devices. Further researches can be done to investigate the impact of mobile applications on larger groups of students. Other studies can be done to examine the effect of mobile applications on students' motivation and autonomy.

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