The Impact of Text-Messaging on Vocabulary Learning of Iranian EFL Learners

IMPACT DE LA TEXT-MESSAGING SUR L'APPRENTISSAGE DU VOCABULAIRE DES APPRENANTS D'ANGLAIS EN LANGUE ETRANGERE IRANNIENNE

Omid Tabatabaei[1,*]; Abdolsamad Heidari Goojani[2]

[1] Department of English, Najafabad Branch, Islamic Azad University, Najafabad, Iran.
[2] Department of English, Najafabad Branch, Islamic Azad University, Najafabad, Iran.
*Corresponding author.

Abstract

Vocabulary learning is one of the major challenges foreign language learners face during the process of learning a language. One way to alley the burden is to assist students in becoming independent learners during the process of L2 vocabulary learning. This could be achieved through instructing learners to use their mobile phone as an efficient tool to learn vocabulary. Mobile phones are the new addition to the information and communication technologies (ITC) for learning. The present research investigates the effectiveness of text-messaging on vocabulary learning of EFL learners. To fulfill the purpose of the study, 60 learners from among 90 Iranian high school students participated in the study. The participants were divided into two equal groups of experimental and control based on the results of a proficiency test. The target words in the book *English for Pre-University Students* by Birjandi, Samimi and Anabisarab (2007) were taught to the groups, using synonyms and antonyms. Six to seven words were introduced and taught to these students each session. The participants in the experimental group were required to send the researcher SMSs containing a sentence for each covered word in class while those in the control group wrote some sentences containing the target words to exchange them with their partners and bring their assignments to the class the next session. Results of *t*-test analysis indicated that participants in the experimental group outperformed those in the control group. The results of this study can help teachers to provide a flexible situation to teach new vocabulary, and also provide pedagogical implications for utilizing text-messaging as an effective and flexible learning tool.

Key words: Mobile assisted language learning; Involvement load hypothesis; Short message service

Résumé

L'apprentissage du vocabulaire est l'un des défis majeurs des apprenants en langues étrangères sont confrontés au cours du processus d'apprentissage d'une langue. Une façon de ruelle le fardeau est d'aider les étudiants à devenir des apprenants indépendants au cours du processus de l'apprentissage du vocabulaire L2. Cela pourrait être réalisé grâce à instruire les apprenants à utiliser leur téléphone mobile comme un outil efficace pour apprendre le vocabulaire. Les téléphones mobiles sont la nouvelle addition à des technologies de l'information et de la communication (TIC) pour l'apprentissage. La présente recherche examine l'efficacité de la messagerie texte sur l'apprentissage du vocabulaire des apprenants d'anglais langue étrangère. Pour atteindre l'objectif de l'étude, 60 apprenants parmi 90 étudiants iraniens secondaire ont participé à l'étude. Les participants ont été divisés en deux groupes égaux de expérimental et de contrôle basé sur les résultats d'un test d'aptitude. Les mots cibles dans les Anglais livre pour étudiants pré-universitaires par Birjandi, Samimi et Anabisarab (2007) ont appris à des groupes, en utilisant des synonymes et des antonymes. Six à sept mots ont été introduits et a enseigné à ces élèves de chaque session. Les participants du groupe expérimental ont été tenus d'envoyer les SMS contenant des chercheurs une peine pour chaque mot couvert dans la classe, tandis que ceux dans le groupe témoin a écrit quelques phrases contenant les mots-cibles pour les échanger avec leurs partenaires et d'apporter leurs missions à la classe de la prochaine session. Résultats de test-t analyse a indiqué que les participants du groupe expérimental ont surpassé ceux du groupe témoin. Les résultats de cette étude peut aider les enseignants à créer une situation flexible pour enseigner le vocabulaire nouveau, et fournissent

également des implications pédagogiques pour utiliser la messagerie texte comme un outil efficace et flexible d'apprentissage.

Mots clés: Apprentissage des langues assisté par mobilis; L'hypothèse de la participation de charge; Service de message court

INTRODUCTION

Mobile phones are particularly useful mini-computers that fit in students' pocket, are always with them, and are nearly always on (Prensky, 2005). The widespread experimentation with mobile devices for Learning initiated in mid 1980s when Twarog and Pereszlenyi Printer used the telephone to provide distant learners with feedback and assistance. During 1990s, instructors at Brigham Young University-Hawaii taught a distance education English course from Hawaii to Tonga via telephone and computer (Green & Evans, 2001). During the 2000s, MALL continued its progress, for example, Dickey (2001) utilized teleconferencing to teach an English conversation course to students in South Korea. Stanford University learning lab used integrated mobile phones in a Spanish learning program in 2001 (Brown, 2001).Thornton and Houser (2002; 2003; 2005) developed several innovative projects using mobile phones to teach English at a Japanese university. They also developed a course management system to facilitate developing language learning material to mobile phones. University of Wisconsin - Madison developed several foreign language courses which used wireless handheld computers for various classroom activities (Samules, 2003).

The advancements in mobile technology have also caused a lot of changes in the effectiveness of using mobile devices in language education (Baker & Frank, 1992). City College, Southampton developed a web-based "media board" (similar to a web-board) but supporting Multimedia Messaging Service (MMS) as well as Short Message Service (SMS) and supplied learners of English as a Second Language (ESL) with mobile phones, inbuilt cameras and voice recording facilities (JISC, 2005).United Kingdom's Open University used voice recorders and mini-camcorders to record interviews with other students and locals to create audiovisual tours in distance-learning German and Spanish course (Kukulska-Hulme, 2007). United Kingdom's Open University also recently used mobile phones for language learning.

Today, due to the growth of wireless and emerging technologies, MALL is available through numerous devices including mobile phones, iPods, tablet PCs, hand-held computers, PDAS, MP3 players, Smart phones and more. MALL designers have begun to move away from merely copying the traditions of standard non-mobile language and are implementing techniques that maximize the benefits of these new devices. The increasing number of possible delivery tools has spawned a wide-range of mobile language learning programs, from very-short tutorials to full courses. The number of people capable of producing MALL content is also on the rise, due largely to a combination of increased popularity, demand and advent of content generation tools that simplify the programming process through the use of templates and macros.

MALL currently serves not only as a primary source of language education for students, but also support the retention and utilization of newly- acquired skills whenever they are required. Through mobile participation in short exercises and tasks, learners are able to keep their linguistic talents sharp while reducing the risk of degradation of valuable knowledge, skills and abilities. Consensus among the limited literature and studies available specifically about MALL indicate that the demand for it will only increase – along with the demand for second language acquisition and learning flexibility. Predicted growth is reinforced by the overall decrease in free time. With people working longer hours, the time necessary for formal, traditional classroom-based or even standard online courses will decrease. MALL will be an ideal solution to busy students and professionals seeking to acquire one or more new languages.

REVIEW OF THE RELATED LITERATURE

A study by Vavoula in Sharples *et al.* (2005) found that 51 per cent of everyday adult learning takes place either at home or in the office. Although the study does not provide a definition for learning or how learning was measured, it shows that a certain level of knowledge enhancement has occurred. The Study further describes that learning takes place in various places. 21 per cent of learning happens outside the office at the workplace, 5 per cent of the learning happens outdoors, 2 per cent happens at a friend's house, and 6 per cent happens at places of leisure. It is also reported that 14 per cent of learning takes place at other locations and 1 per cent occurs on forms of transport. The fact that only 1 per cent of learning takes place while learners are on the move indicates that mobile learning does not equate to physical movement. However, the study proves that learning takes place anytime and anywhere and it can take place outside the classroom environment.

Thirdly, developing a theory of learning must enable successful learning. Successful learning is related to effective learning. According to the US National Research Council (1999), effective learning constitutes four

elements: (1) learner centered, (2) Knowledge centered, (3) assessment centered and (4) community centered. Learner centered deals with positioning learners at the center of the educational process (Brindley, 1984). Hence learners are responsible for their acquisition of knowledge and the building of skills. Knowledge centered deals with the curriculum which is built on validated knowledge, taught effectively and efficiently. Assessment centered, on the other hand, focus on evaluating learners' ability, diagnosing problems and offering guidance which may lead to success in learning. Community centered promotes the sharing of knowledge and learning supporting each others' learning. These four elements adhere to the socio-constructivist approach to the process of learning where learning is not a lonely journey but rather an individual effort with environment and community support. Finally, a theory of mobile learning must also consider the use of ubiquities technology and how the learning community is responding to it. In the UK for the year 2005, a study revealed that 95 per cent of young adults aged between 15 and 16 owned mobile phones Mail (15 February 2005: www.Literacytrust.org.uk/Database/texting.html#fog). A similar study conducted in Malaysia revealed that 100 per cent of higher education learners aged between 18 and 21 owned mobile phones (Abd Rahman *et al.*, 2009). Those studies further indicate that learners are equipped with devices that enable them to learn anytime and anywhere.

STATEMENT OF THE PROBLEM

In spite of the potentials of mobile technology in facilitating second/foreign language learning, to the best of the researcher's knowledge, nearly no attempts have been made in Iran to develop mobile teaching/learning programs which can facilitate learning of English as a foreign language. The Iranian teachers and scholars involved in the issues related to English language pedagogy believe that in Iranian schools, the students' progress in learning English has not been as successful as it has been expected and the teachers are expressing the need for some reforms in the approaches and materials used in teaching English as a foreign language, also many students have become tired of learning words in traditional ways. An interview with some of the students showed that they are desperate of learning words which are essential to get their massages across in language classes; in addition, it was found that due to inadequate class time, they were not much able to learn the indispensable words. They reported that they cannot memorize all the essential words appearing in their books.

The lack of change and reform in the conventional approaches to English language education is perhaps one of the reasons for the mentioned students' failures. The materials used by English language teachers and students are mostly confined to blackboard, the course book, and

maybe some pictures. This is why the use of mobile technology might increase the Iranian students' motivation and catalyze their success in learning English as a foreign language. The present study, therefore, aims to implement a complementary teaching aid to solve the learners' vocabulary learning problems. Therefore, it has been hypothesized that vocabulary learning via text-messaging, which is defined as the ability to send and receive short text messages on a cellular device (Kim, 2010), has the potential to solve some of the problems that EFL students have encountered.

RESEARCH QUESTIONS

The present study aims at investigating the effectiveness of using text-messaging in English vocabulary learning. Thus, the following research questions have been addressed in the study:

1. Does the application of short message service positively affect the vocabulary learning achievement of EFL learners?

2. Do EFL learners have positive attitudes towards the application of SMS in vocabulary learning?

3. Do L2 teachers have positive attitudes towards the application of SMS in vocabulary learning?

RESEARCH HYPOTHESES

In line with the aforementioned questions, the following null hypotheses have been formulated:

H_1: The use of short message service does not positively affect the vocabulary learning achievement of EFL learners.

H_2: EFL learners have positive attitudes toward the application of SMS in vocabulary learning.

H_3: L2 teachers have positive attitudes toward the application of SMS in vocabulary learning.

OBJECTIVES OF THE STUDY

Vocabulary knowledge is considered by both L1 and L2 researchers to be of great significance in the development of language competence (Nation, 2001; Laufer, 1998), and learning sufficient amount of vocabulary knowledge seems to play a vital role in EFL/ESL contexts, so we should seek new ways of enhancing this process. One of these ways is the overwhelming and innovative *mobile assisted language learning* (MALL) technologies which inspire teachers and researchers to develop learning as an anywhere process; therefore, the present study has a great potentiality to contribute to TEFL both from theoretical and pedagogical perspectives. Its significance can be predicated on the assumption that with a limited amount of in- class teaching time, it sounds indispensible to look

for other ways which conveniently provide language learners with substantial language learning experience, and since it has not been dealt with in our country, its contribution and significance can be of great value.

As there has been little, if any, research in Iran on mobile learning, the results of the present study may offer information germane to understanding mobile learning, particularly on vocabulary learning via text-messaging.

METHOD

Participants

An original population of 90 pre-university students of Shahed high school in Farsan, Iran, participated in this study. An Interchange Placement Test (Richard, 2005) was administered to homogenize the students, based on their proficiency level. At the end, 60 students who scored in the midrange of correct items on Interchange Placement Test (Richard, 2005) were selected. Following the scores of IPT, they were assigned to two groups, one experimental and one control group, identical in number. All the participants in the research were pre-university boys; within the age range of 17and 18 and they were all native speakers of Persian. Eight experienced high school English teachers, who have taught English for more than 12 years participated in the study to give their attitudes toward teaching vocabulary through applying SMS.

Instrumentation

This study proceeded in applying three instruments. First, a proficiency test was administered to screen the subjects and homogenize them based on their level of proficiency.

Second, an achievement test for the initial and final evaluation was constructed by the researcher based on English Book (2) for Pre-University Students (Nemati-Moghadam & Abbasi, 2110). It included forty vocabulary multiple-choice items, with four alternatives for each sentence. It was designed and then tested in advance through a pilot study. Based on the performance of the participants, the characteristics of the individual items were determined and some items were revised. Having done a pilot study,15 similar students at the same level in a high school in Farsan participated, the researcher, using KR-21 formula, estimated the test reliability which was found to be 0.785. To determine validity of the test, the researcher asked the supervisor and nine experts and high school teachers to pass their comments on the content of the test; consequently, some items were deleted and some were modified based on lexical selection, grammatical points, and appropriateness and inappropriateness of distracters. The test had a total of forty points, and the time allotted based on the pilot test was determined to be fifty minutes. Eventually, the researcher came up with 40 items, which were used as the pre-test and post-test.

Third, two attitudinal questionnaires including 20 items (see Appendix A and B) that would show the students' and teachers' attitudes towards learning vocabulary were administered. The reliability of the questionnaires was determined through exact pilot studies. To determine the validity of the questionnaires the researchers asked some experts and English teachers to pass their ideas on validity and content of the questionnaires. The reliability of the questionnaires were 0.8 and 0.7.

Procedures

An original population pool of 90 high school students in Farsan Shahed high school participated in this study. First, after administering the Interchange Placement Test by Richard, (2005) 60 intermediate high school students out of a pile 90 were considered as the valid sample of this study based on one standard deviation below the mean. Thirty of the participants were randomly assigned to the experimental group; the other thirty formed the control group, all male.

Second, four units of the same book, English Book for the Pre-university Students (Birjandi, Samimi & Anabisarab, 2007), were taught for a period of two months, twelve sessions plus two sessions for the pretest and posttest. The teaching procedures followed in both groups were similar; both groups attended the class twice a week on Saturdays and Wednesdays from 8 to 9:30. They were asked to make some sentences in the class to become familiar with these words; they were also asked to work cooperatively in some small groups of 3 or 4 in order to have a greater opportunity to talk about these words. Each session, 5 to 6 words were introduced and taught to the students.

The present study drew on the assumptions and components of the Involvement Load Hypothesis, consisting of three components (*need, search, evaluation*) and spacing effect; the participants in the experimental group sent the researcher one text-message containing an original sentence for each covered word in the class on Saturday and Wednesday morning, and the teacher provided them with necessary feedback either explicitly or implicitly; the participants had to send one text- message containing a sentence to their three predetermined partners, whenever they like before they came to class and they had to their partners with feedback, if any.

The participants in the control group wrote one sentence for each covered word; they were also asked to write one sentence to exchange with their partners and bring their assignments to the class next session; they also received feedback on their assignments as it was a normal case in the traditional assignments. The students in the text-messaging group received feedback rather immediately; they were sent the correct sentences or the incorrect part rewritten in the parentheses. Other students in the control group received feedback when they returned their assignments to the class; the mistaken parts were underlined or given explicitly. The same procedures

followed in subsequent sessions. After being taught for 6 weeks (12 sessions), the posttest was administered to find out the results. About 40 words out of 60 tested in posttest.

Finally, a questionnaire was administered to the participants of both groups and some teachers to see their point of view about using SMSs. The time considered to complete the questionnaires was 20 minutes for teachers and 20 minutes for participants. The questionnaires had two formats; English for teachers and Persian for the students. Both questionnaires were equal in number and length.

RESULTS AND DISCUSSION

Several statistical analyses were conducted to answer the research questions in this study.

This study required a comparison of two groups drawn from the population (fourth grade) senior high school students in Farsan (a City in Iran).

Table 1
Descriptive Results for IPT as a Homogenizing Test

Group	N	Mean	Std. Deviation	Std. Error Mean
Control group	30	41.73	5.212	.952
Experimental group	30	41.73	5.247	.958

After administration of the Interchange Placement Test at the first session of the study, the subjects were divided into two intact groups of experimental and control. Then in order to ascertain the homogeneity of the two groups. A *t*-test was run. Table 1 indicates the results of *t*-test.

As presented in Table 1 and 2, there was no significant difference in the scores for the experimental and control groups, t (58) = 0.025, $p<0.05$. in other words, there was no difference between mean performances of the two groups; therefore, it can be concluded that they were at the same level of proficiency and hence, homogeneous.

Table 2
The Difference between Control and Experimental Groups across IPT Scores

	Levene's Test for Equality of Variances		T-test for Equality of Means			
	F	Sig	t	df	Sig(2-tailed)	Mean Differences
Equal variance assumed	.002	.969	025	58	.980	.033
Equal variance not assumed			.025	57.997	.980	.033

In order to assess the application of short message service on teaching vocabulary to Iranian high school EFL learners, the obtained scores from pre-test and post-test were analyzed.

Table 3
Descriptive Statistics for Pre-test and Post-test Scores across Control and Experimental Groups

		N	Mean	Std.Deviation	Min	Max
	experimental	30	16.53	4.075	8	22
Pretest	control	30	16.43	3.803	8	23
	Total	60	16.48	3.939	8	22
	Experimental	30	26.67	7.085	17	38
Posttest	Control	30	21.10	4.894	11	28
	Total	60	24.17	5.989	14	33

As presented in table 3, there were 60 participants across two groups who took the pre-test and post-test. Concerning the separate group performances, for the experimental group, the pretest scores ranged from 8 to 22 while the posttest scores were between 17 and 38. Moreover, for the control group the pretest scores were between 8 and 23 as against the posttest scores which ranged from 11 to 28. In general, the highest and the

lowest scores were 23 and 8 in the pre-test and 17 and 38 in the post-test respectively. Besides, the mean score for experimental group ranged from 16.53 in pre-test to 26.67 in post-test with an SD of 7.085. Meanwhile, the mean score for control group varied from 16.43 in pre-test to 21.10 in post-test with an SD of 4.894. Therefore, descriptively, the experimental group appeared to have outperformed the control group.

Following an overall look at the pre-test and post-test performances across two control and experimental groups, separate paired samples *T*-test were conducted to evaluate the learners' achievement over the two investigated groups.

As for the control group, the pre and post scores were compared the results of which are presented in the below table.

Table 4
The Difference between Pre-test and Post-test Scores for the Control Group

| | | Paired Differences | | | t | df | Sig. (2-tailed) |
		Mean	Std. Deviation	Std.Error Mean			
Pair 1	pretest posttest	-4.667	2.523	.461	-10.129	29	.000

As table 4 shows, there was a significant difference between participants' performance from pre-test to post-test, *t* (29)= 10.129, *p*=.000. Therefore, from paired sample statistics, it can be concluded that using synonyms and antonyms has had a positive effect on L2 Iranian EFL learners' vocabulary learning and learning has occurred during the course.

In the next stage of analysis, the experimental group's performance was evaluated through their recorded pre and post test scores over the application period.

Table 5
The Difference between Pre-test and Posttest Scores for the Experimental Group

| | | Paired Differences | | | t | df | Sig. (2-tailed) |
		Mean	Std. Deviation	Std.Error Mean			
Pair 1	pretest posttest	-10.200	5.480	1.000	-10.195	29	.000

Based on the above indicated results, there was a significant difference between participants' performance from pre-test to post-test, *t* (29) = 10.195, *p*=.000. Therefore, it can be concluded that using SMS has had positive effect on L2 Iranian high school learners' vocabulary learning. Consequently, based on Tables 4 and.5, the first null hypothesis is rejected. Put it differently, the application of short message service facilitates vocabulary learning of Iranian high school EFL learners.
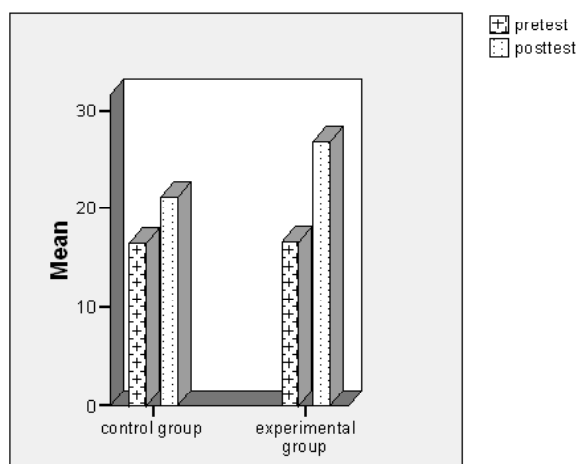
Figure 1
Graphic Representation of Separate Groups' Performances

An overall graphic representation of the differences in the pre and post tests performances is represented in the above graph.

Figure 1 demonstrates the mean scores in pre-test and post-test for the experimental and control groups. It implies that the scores in post-test were higher than pre-

test with a more profound difference in the experimental group.

Finally, to highlight the existence of a difference in the performances over control and experimental groups, the posttests were compared through an independent sample T-test to see if they were different.

Table 6
The Difference between Post-test Scores across Control and Experimental Groups

	Levene's Test for Equality of Variances		T-test for equality of means			
	F	Sig	t	df	Sig(2-tailed)	Mean Differences
Equal variance assumed	3.382	.064	-3.583	58	.001	-5.633
Equal variance not assumed			-3.583	51.543	.001	-5.633

Accordingly, the two groups were significantly different in their post-test scores (p < .05). In other words, although both groups showed higher performance on the post-tests, the experimental group achieved a significantly better achievement of vocabulary items in contrast with the control group.

To answer the second and third questions, the next

sections will deal with the students' and teachers' attitudes towards application of short message service.

In order to have an overview of the learners' attitudes, the responses to the questionnaire designed to obtain the students' attitudes towards using SMS in teaching vocabulary in experimental group were analyzed.

Table 7
Descriptive Statistics of Students' Attitude towards SMS

		N	Mean	Std. Deviation	Std. Error Mean
attitude	attitude	30	73.7000	12.74457	2.32683

Based on the results presented in table 7, the mean score of the students in the experimental group has been 73.700 which represents that the students had positive

attitudes towards the application of SMS in teaching vocabulary. So, it can be concluded that the second null hypothesis was approved.

Table 8
One-sample Statistics for Experimental Group's Attitudes

					Test Value = 0	
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Attitude	31.67	29	.000	73.70	68.94	78.45

In order to analyze the students' attitude in the questionnaire, a one-sample *T*-test with the suggested mean value of zero was conducted. A rejection of this value will certainly prove the learners' high attitudes toward the employed methodology.

Statistically, to prove the learners' high interest in use of SMS procedure, the suggested mean in this table should be higher than the predicted mean. The suggested computed mean lies between 0+68.94 and 0+78.45 that is between 68.94 and 78.45 that is higher than the predicted mean that is zero. Therefore, in the learners' ideas

vocabularies acquired through SMS can improve their vocabulary retention.

Finally, the researcher dealt with teachers' attitudes towards the application of short message service to teach vocabulary**.** To serve this purpose, a questionnaire was administered to obtain the teachers' attitude towards using SMS in teaching vocabulary. Table 10 shows descriptive statistics of teachers' attitude towards short message service. One is referred to Appendix H to have a more detailed account of the teachers' attitudes in this section of the study.

Table 9
Descriptive Statistics of Teachers' Attitude towards SMS

	N	Mean	Std. Deviation	Std. Error Mean
attitude	12	71.16	11.36	3.27

Accordingly, the mean score of teachers' questionnaire was 71.16 and Std. Deviation was 11.36. It can be concluded that teachers also have had positive attitudes toward the application of SMS. Therefore, the third null hypothesis is also proved.

Table 10
Sample Statistics for Experimental Group's Attitudes

			Test Value = 0			
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
attitude	21.70	11	.000	71.16	63.94	78.38

Statistically, to prove the teachers' high attitudes concerning the application of SMS, the suggested mean in this table should be higher than the predicted mean. The suggested computed mean lies between 0+63.94 and 0+78.38 that is between 63.94 and 78.38 that is higher than the predicted mean that is zero. Therefore, the teachers had highly positive attitudes towards the use of SMS service in vocabulary retention.

DISCUSSION

The main purpose of this study was to explore the impact of text-messaging on vocabulary learning of EFL learners. In this regard, a t-test was conducted to probe the first question in this study. The results revealed that there was a significant difference between the means of experimental and control groups. Therefore, it can be concluded that using short message service has a significant impact on vocabulary learning of Iranian EFL high school students. In order to answer the second and the third questions two attitudinal questionnaires were administered. The results showed that both students and English teachers had positive attitudes toward the application of SMS on vocabulary learning of the students.

This finding is compatible with some of the empirical studies conducted earlier and reported in literature review. Thornton and Houser (2005) describe a study which used mobile phones to teach English at a Japanese university, comparing web-based with SMS-based learning. The results indicated that students who learned by SMS remembered over twice the number of vocabulary words as the students who learned through the web-interface. The conclusion was that the SMS-based lessons had been more effective because they were delivered as push media, rather than passive email messages. This motivated the students to rehearse more frequent which resulted in better retention of the material. Chen and Hsieh (2008) present a study using SMS and MMS messages for the study of English vocabulary. They experimented with four types of annotations: words only, words with written annotation, words with pictorial annotation and words with both written and pictorial annotations. The experiment was conducted among 160 students from the Industrial Education Department in Kaohsiung. The students were divided into four groups of 40 students each, based on a pre-measurement of their short term memory (STM) capacity for their verbal and visual learning capabilities. The study addressed particularly the issue of content adaptation of these four different cognitive types of learners. In the experiment, all the participants received the same 24 questions, divided equally into the four types. The results showed that indeed, providing learning content with pictorial annotation in a mobile language learning environment helps learners with lower verbal and higher visual ability, while the provision of learning content with both written and pictorial annotations helps learners with high verbal and visual ability.

CONCLUSION

The results of the present study seem to support the hypotheses formulated in this research. The first one is, the use of short message service does not positively affect the vocabulary learning achievement of EFL learners. The results of attitudinal questionnaires used in this study support the second and the third hypotheses that the students and English teachers have positive attitudes towards the application of text-messaging on vocabulary learning of Iranian EFL learners.

The researchers tried to investigate the potential

usefulness of mobile technology in inclusion of this ubiquitous tool as a more practical aspect of vocabulary learning into language classroom.

REFERENCES

Abd Rahman, H., Badusah, J. & Wahid, R. (2009). Applications of Handphone/PDA Amongst Private College Students. In *Proceeding of The 4th Regional Education Seminar 2009*. Universiti Kebangsaan Malaysia, Bangi.

Baker, C. & Frank, B. (1992). *Item Response Theory: Parameter Estimation Techniques*. New York: Marcel Deker.

Birjandi, P., Anabisarab, M. & Samimi, D. (2007). *English for Pre-University Students*. Iran: Ministry of Education.

Brindley, G. (1984). *Need Analysis and Objective Setting in Adult Migrant Education Program*. Sydney: NSW Adult Migrant Education Service.

Brown, E. (2001). Mobile Learning Exploration at Standford Learning Lab. *Speaking of Computers* (pp. 55). Stanford, CA: Board of Trustees of the Leland Junior University. Retrieved on July 24, 2010.

Dickey, R. J. (2001). Make It a Conference Call: An English Conversation Course by Telephone in South Korea. In L.E. Henrichsen (Ed.), *Distance-Learning Programs* (pp. 51-60).

Glaserfeld, E. Von (1984). *An Introduction to Radical Constructivism.*

Green, B. & Evans, N. (2001). Teaching Tomorrow's Class Today: English by Telephone and Computer from Hawaii to Tonga. In L.E. Henrichesen (Ed.), *Distance-Learning Program* (pp. 71-82). Alexander, VA: Teachers of English to Speakers of Other Language, Inc.

JISC (Joint Information System Committee). (2005). Multimedia Learning with Mobile Phones. Innovative Practices with E-learning. *Case studies: Anytime, Anyplace Learning*. Accessed 25th Augest 2011 from: http://www.jisc.ac.uk/uploaded-documens/southampton.pdf

Kim, Y. J. (2010). The Role of Task-induced Involvement and Learner Proficiency in L2 Vocabulary Acquisition. *Language Learning, 58*, 285-325.

Kukulska-Hulme, A. (2007). Mobile Useability in Educational Contexts: What have We Learnt? *International Review of Research in Open and Distance Learning, 8*(2), 1-16.

Laufer, B. (1998). The Development of Passive and Active Vocabulary in a Second Language: Same or Different? *Applied Linguistics, 12*, 255-271.

Nation, I. S. P. (2001). *Learning Vocabulary in Another Language*. Cambridge University Press.

Nematimoghadam, R. & Abasi, A. (2010). *Complete Book for Pre-University Students*. Iran: Ministry of Education.

Nyiri, K. (2002). Towards a Philosophy of M- Learning. In *Proceedings of IEEE International Workshop on Wireless and Mobile Technologies in Education (WMTE 2002), 29-30 Augest 2002*. Teleborg Campus.

Nyiri, K. (2005). The Mobile Phone in 2005: Where are We Now?. In *Proceedings of "Seeing Understanding, Learning in the Mobile Age"*. Budapest.

Pinkwart, N., Hoppe, H. U., Milrad, M. & Perez, j. (2003). Educational Scenarios for Cooperative Use of Personal Digital Assistants. *Journal of Computer Assisted Learning, 19*(3), 383-391.

Polsani, P. (2003). Network Learning. In NyIri, K (Ed), *Mobile Learning Essays on Philosophy, Psychology and Education* (pp. 139-150). Vienna: Passagen Verlag, ISBN 3 85165 603 2.

Prensky, M. (2005). What can You Learn from a Cell Phone? Almost Anything!. *The Innovative Gateway 1* (June/July). Retrieved July 24, 2011 from: htpp//www.inovateonline.info/index.php

Quinn, C. (2000). M-learning: Mobile, Wireless, In-Your-Pocket Learning. LiNE Zine. Fall. Samules, J. Wireless and Handheld Devices for Language Learning. In *Proceedings of the 19th Annual Conference on Teaching Distance Teaching and Learning, Madison, WI. 2003*. http:// www.uwex.edu/disted/conference/Resource- library/proceeding/o3-50.pdf

Sharples, M. (2005). Learning as Conversation. Transforming Education in Mobile Age. In *Proceedings of "Seeing Understanding, Learning in the Mobile Age", 28-30 April* (pp. 147-152). Budapest.

Sharples, M., Taylor, J. & Vavoula, G. (2005). Towards a Theory of Mobile Learning. In *Proceedings of Mlearn 2005 Conference, 25-28 October*. Cape Town, South Africa.

Thornton, P. & Houser, C. (2002). M-Learning in Transit. In P. Lewis (Ed.), *The Changing Face of CALLN* (pp. 229-243).

Thornton, P. & Houser, C. (2003). Using Mobile Web and Video Phones in Enlish Language Teaching: Projects with Japanese College Students. In B. Morrison, C. Green & G. Motteram (Eds.), *Direction in CALL: Experience, Experiment & Evaluation* (pp. 207-224).

Thornton, P. & Houser, C. (2004). Using Mobile Phones in Education. In *Proceedings of International Workshop on Wireless and Mobile Technologies in Education (WMTE2004)* (pp. 3-10). Jungli, Taiwan: IEEE Computer Society Press.

Thornton, P. & Houser, C. (2005). Using Mobile Phones in English Education in Japan. *Journal of Computer Assisted Learning, 21*, 217-228.

Traxler, J. (2005). *Defining Mobile Learning*. In *Proceedings of IADIS International Conference Mobile Learning 2005* (pp. 261-266). Malta.

Turunen, H., Syvaenen, A. & Ahonon, M. (2003). Supporting Observation Tasks in a Primary School with the Help of Mobile Devices. In K Nyvri (Ed.), *Mobile Learning: Essays on Philosophy, Psychology and Education. Communications in the 21st Century* (pp. 209-221). Vienna: Passagen Verlag.

Twarog, L. & Pereszlenyi-Printer, M. (2006). Telephone-Assisted Language Study and Ohio University: A Report. *The Modern Language Journal*, 72, 426-434.

Vavoula, G. & Sharples, M. (2001). *Studying the Learning Practice: Implications for the Design of a Lifelong Learning*. Support System in IEE (pp. 379-380).