

The Effect of Short Message Service on the Retention of Collocations among Iranian Lower Intermediate EFL Learners

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Abstract—The rapid developments in information and communication technologies (ICT) have created new opportunities to enhance the reach and quality of education. Mobile phones are new addition to the ICT for learning. This study attempts comprehensively to investigate the effect of Short Message Service (SMS) on the retention of collocations among Iranian lower intermediate EFL learners. To this end, forty university students were assigned into experimental and control group. The participants received English collocations as well as definitions and example sentences either on paper or through SMS messages in a scheduled pattern of delivery two times a week during five weeks. After the third and the sixth session of treatment, students received two quizzes either on paper or via SMS in order to show whether the students progress during the treatment or not. Students were compared at the end of the study. The results revealed the fact that participants in SMS group could significantly outperform the ones in conventional group.

Index Terms—Global System for Mobile Communication (GSM), Short Message Service (SMS), Personal Digital Assistants (PDAs), Mobile Learning (M-learning), retention, collocation

I. INTRODUCTION

There is considerable interest from educators and technical developers in exploiting the unit capabilities and characteristics of mobile technologies to enable new and engaging form of learning, as Cavus and Ibrahim (2009) pointed out, "There is an increasing use of wireless technologies in education all over the world. In fact, wireless technologies such as laptop computers, mobile phones are revolutionizing education and transforming the traditional classroom based learning and teaching into anytime and anywhere education".

As Kukulka-Hulme and Shield (2008) defined, widespread ownership of Mobile and wireless devices means that learners are increasingly in a position to take the lead and engage in activities motivated by their personal needs and circumstances of use, including those arising from greater mobility. The anytime, anywhere capabilities of mobile devices encourage learning experiences outside of a teacher managed classroom environment (Sharples, 2003). As McNicol (2004) believed, the immediacy and portability of mobile phones allow students to learn in their proffered time and place.

According to Anohina (2005), SMS refers to the use of technology for learning in a broad sense and encompasses educational processes carried out in compliance with different theoretical models pursued using different educational methods and is based on activities that take place via any electronic medium.

In Iran there are only two hours per week for the English class in most universities and schools, so the English class becomes the only time to use English and learners face the challenge of lacking exposure to English. Teachers must make difficult choices about how to use the limited time to promote language learning and there is an urgent need for them to find an effective self-study approach for students to enlarge their collocations size, they also should make students aware of collocations and encourage them to store collocations in their memory by new methods and technologies. "Because of class time constraint and the importance of collocations, most of reinforcement and study is the responsibility of students outside the classroom" (Grace1998, p.8).

As Thornbury (2004) indicated, two factors determine retention. First; those words that are easy to learn are better retained. Second, those words that are learned over spaced learning sessions are retained better than words that are learned in concentrated burst. Teachers should find ways to promote their students to use English anytime and anywhere. With that in mind, the researcher examined the effectiveness of Short Message Service, benefits of personal, informal,

context-aware and situated learning, on the retention of collocations among Iranian lower intermediate EFL learners, and also estimated subjects' attitudes toward learning collocations via SMS.

Collocations are rarely learned and experienced and most of the times ignored in language classes in Iran. The startling fact here is that just the tiny percent of learners will ever pay attention to collocations. The result whatsoever, whether young teachers are not aware of collocations' important role or the students unconsciously ignore learning them, leads to incomplete English learning, which means that the students are not able to be fluent though they have passed several intensive courses.

Whereas the presentation of mobile phones in "Asian countries" keeps climbing and SMS is being widely used by youth today as a means of communication, few researchers have explored the application of the SMS in second language learning (Lu, 2008, p.1).

According to Thornton and Houser (2005), mobile phones enhance regular study, which in turn leads to more exposure than did the detailed presentation of the lessons. Their findings are in accordance with the empirical constant and distributed practice has a more beneficial effect on memory and learning than massed practice.

The integration of mobile technologies into teaching and learning has been more gradual, as educators have sought to understand how best to use their tool to support various kind of learning. Moura and Carvalho (2010) defined "we can deliver several learning activities to students easily and immediately via SMS technology". Moreover their findings show that students have positive perception about the use of mobile phones as a learning tool.

Using mobiles for learning can assist students' motivation, encourage a sense of responsibility, help organizational skills, act as reference tools, and help track students' progress and assessment (Savill-Smith and Kent, 2003).

The researcher in this study believed that SMS can help extend learners' opportunities in meaningful ways and provides better conditions for learning collocations. With that in mind, she tried to examine the effect of introducing collocations on the small screen of mobile phones on collocations retention of Iranian Lower-Intermediate EFL learners. She also investigated the participants' attitudes toward learning vocabulary via SMS.

II. REVIEW OF LITERATURE

Over the past two decades there appear to be a paradigmatic shift away from education and training to learning; from teacher-centered to student-centered education; from rote learning to learning as reflection; and from face-to face to distance and e-learning (Jarvia, Holford, & Griffin, 2003). The dominant features of this shift are the rapid growth of information and communication technologies, the innovative application of technology which enhances the delivery of education. The wave of interest in the educational potential of handheld technology is seen as a deliberate effort aimed at "domesticating" mobile devices for educational purposes (Bachmair, 2007, p.106). Mobile devices are today seen as offering new learning possibilities which represent a dynamic change in the strategies employed by learners and their production and consumption of learning products (Conole et al 2008). There is considerable interest from educators and technical developers in exploiting the unique capabilities and characteristics of mobile technologies to enable new and engaging forms of learning (Naismith, Lonsdale, Vavoula, & Sharples, 2004).

According to Geddes (2004), mobile learning is identified both by being available "anywhere, anytime", we learn across space as we take ideas and learning resources gained in one location and apply them in another. We learn across time, by revisiting knowledge that was gained earlier in a different context through ideas and strategies gained in early years providing a framework for a lifetime learning (Vovoula and Sharples, 2002).

The effectiveness of using SMS-based mobile learning to support classroom teaching of English phrases to high school students in rural Nigeria was carried out by Vivian Ogochukwu Nwaocha; at National Open University of Nigeria (2009). In order to determine if there were significant differences between students' success rate, pretests were administered to the experimental and control groups, after both received classroom instructions from the same Instructor. Subsequently, posttests were administered to both groups, after the experimental and control groups had received SMS-based instruction and extra classroom instructions respectively. The results clearly revealed that after receiving the SMS-based instruction, the experimental group performed better than their counterparts who had received additional classroom instructions.

Cavus and Ibrahim (2009) investigated the use of wireless technologies in education with particular reference to the potential of learning new technical English language words using SMS. The system, developed by the authors and called mobile learning tool (MOLT), was tested with 45 1st-year undergraduate students. During the experiment, new words and their meanings were sent to students throughout the day in half hourly intervals and their learning abilities were assessed by performing on tests before and after the experiment. The results showed that students "enjoyed and learned new words with the help of their mobile phones" (p. 89).

Lu (2008) examined the effectiveness of SMS vocabulary lessons of limited lexical information on the small screens of mobile phones. Students recognized more vocabulary during the posttest after reading the regular and brief SMS lessons than they did after reading the relatively more detailed print material. Levy and Kennedy (2005) created a similar program for Italian learners in Australia, sending vocabulary words and idioms, definitions, and example sentences via SMS in a spaced and scheduled pattern of delivery, and requesting feedback in the form of quizzes and follow up questions.

Yanjie Song (2008) explored the role of SMS in English as Second Language (ESL) vocabulary learning for mobile audiences. In his research, SMS was integrated into web-based vocabulary learning, and ten participants were involved. An online test system was set-up for recorded assessment data collection, and an open-ended questionnaire interview was

conducted via e-mail to collect qualitative data. The research findings showed significant improvements in the learner performance and in their attitudes towards using SMS in their vocabulary learning.

Thornton and Houser (2002; 2003; 2005) also developed several innovative projects using mobile phones to teach English at a Japanese university. One focused on providing vocabulary instruction by SMS. Three times a day, they emailed short mini-lessons to students, sent in discrete chunks so as to be easily readable on the tiny screens. Lessons defined five words per week, recycled previous vocabulary, and used the words in various contexts, including episodic stories. Students were tested biweekly and compared to groups that received identical lessons via the Web and on paper. The results indicated that the SMS students learned over twice the number of vocabulary words as the Web students, and that SMS students improved their scores by nearly twice as much as students who had received their lessons on paper.

Finally, since there is a paucity of research in the educational context in Iran in this field especially collocations, this study is aimed at analyzing teaching and learning in the context of education via mobile phones. In other words, it seeks to reveal whether Short Message service have any effect on the retention of collocations among lower intermediate learners. To this end, this study was implemented in order to understand the amount of collocations development and retention after five weeks.

III. RESEARCH QUESTION AND HYPOTHESIS

To achieve the goals of the present quasi-experimental study, the following research questions were posed:

Q1: Does Short Message Service have any effect on the retention of collocations of Iranian lower Intermediate EFL learners?

Q2: What are Iranian EFL learner's attitudes towards learning collocations via mobile phone?

To come up with reasonable results on the basis of the aforementioned research question, the following null hypothesis was proposed:

H₀₁. Short Message Service does not have any significant effect on the retention of collocations among Iranian lower Intermediate EFL learners.

H₀₂. Iranian EFL learners do not have any positive attitude toward learning collocations via mobile phone.

IV. METHOD

A. Participants

In this study, sample population was selected out of 110 lower intermediate EFL learners who were studying five majors (Primary Education, Visual Arts, Educational affairs and Special Education) at Hashemi Nezhad Teaching Training Center (TTC) of Mashhad, Iran. Due to the gender segregation rules at TTC, only female students participated in this project. The participants' age ranged from 19-25. In order to homogenize the participant and make sure about their general proficiency level, a Nelson Test (series 200A) was administered to the participants. Having analyzed the data, 40 participants who scored more than 30 were chosen as the subjects of this study, therefore they were randomly assigned into experimental and control group with 20 in each group.

B. Instrumentation

First, the participants' general proficiency was assessed using the standardized 200A test of Nelson English Tests (book 2, Intermediate) developed by Fowler and Coe (1976) to ensure the homogeneity of the groups at the very beginning of the course. The reliability of the tests was estimated by Cronbach's Alpha which is ($r = .816$). It consisted of three sections: cloze tests, structure, and vocabulary in the form of multiple choice questions. There were, in all, 50 items and the time allotted was 45 minutes.

Second, a researcher-made collocation test was administered as pretest. It consisted of 40 multiple choice questions. These collocations were chosen from "*Essential Idioms in English, Phrasal Verbs and Collocations*" (by Dixon, 2003). Each collocation was checked again in 'Oxford Collocations Dictionary'. Since the time interval between the pretest and posttest was long enough, the same pretest was used as posttest too. Based on (Hatch & Farhady, 1982, p. 22), we can use pretest as posttest, if there is more than two weeks duration between them. This lower intermediate collocation test was conducted again as posttest at the end of the course in order to measure the progress of learner's retention of collocation. The reliability calculated through Cronbach's Alpha is ($r = 0.542$).

Third, participants in both groups took two quizzes without knowing the date of administration. On the fourth session when the students had learned 21 collocations via three messages or three papers, the first quiz was administered. Participants took the second quiz on the seventh session when they had learned 42 collocations via six messages or six papers. In experimental group, participants received the quizzes via SMS, whereas in control group the participants took quizzes on paper. Both groups had only ten minutes to answer the questions. Each quiz consisted of ten fill-in blank questions. The reliability of both quizzes was estimated by Cronbach's Alpha which were respectively (0.672) and (0.754).

Finally, participants in experimental group were requested to fill out an attitude questionnaire both before and after the treatment in order to collect students' language learning attitudes and insights for use of SMS in the retention of collocation. Having emphasized to avoid writing their names at top of the page, the researcher coded the questionnaire by

numbers so that the students could honestly respond the questions with no limitation. This questionnaire was formed in 5-point Likert Scale type questions, consisting of 15 items about learning collocations via SMS. Since participants were lower intermediate, the items were written in Farsi so that the students were able to answer the questions. It should be mentioned that items 7 and 9 were prepared to find out what improvements or modifications the students wishes to see in using SMS for learning collocations through SMS. This questionnaire was piloted by the researcher on the same level of participants. Having analyzed the data, the results showed that the reliability of this questionnaire was estimated through Cronbach's Alpha as (0.743).

C. Procedure

At first, a Nelson test was administered to 110 lower intermediate EFL learners who were studying five majors other than English. Having analyzed the data, forty students who scored above 30 were chosen for this study. Before the beginning of the experiment it was checked if all the participants had mobile phones. The model and the features of mobile phones were not important in this experiment because any mobile phone can receive and display short message texts. Then, they were randomly assigned into experimental and control group with 20 in each group.

Participants in both groups took pretest. In order to make sure that all the collocations were new and unfamiliar to both groups; we analyzed the students' responses on the pretest. When 80 percentages of students (32 students) answered one question correctly, we should omit that collocation because almost all the students could recognize the meaning. As a result in this test, there were no items that thirty two students or more could response correctly.

After that, participants in experimental group were asked to fill out an attitude questionnaire to collect their attitudes for the use of SMS in the retention of collocations before participating in the treatment. This questionnaire consisted of fifteen items. Each question was used to represent whether or not there is a positive response to the use of SMS in learning collocations.

During 10 sessions of treatment 70 collocations followed by definitions and example sentences were given to students. In the experimental group, SMS were delivered in a scheduled pattern of delivery two times a week on Saturdays and Mondays at 9.00 p.m. Each message contained seven collocations as well as descriptions and examples. Totally 10 messages were sent during five weeks. The descriptions and examples were chosen as short as possible, so that the students could read these messages on their small screens without having to scroll down many times. In order to make sure that all the students in experimental group received the messages correctly and completely, they were requested to send a text message including "OK". In control group, the participants were given a list of collocations on paper followed by definition and example sentences two times a week just like the experimental group.

Moreover, participants in both groups took two quizzes without knowing the date of administration. On the fourth session when the students had learned 21 collocations via three messages or three papers, the first quiz was administered. After that, Participants took the second quiz on the seventh session when they had learned 42 collocations via six messages or six papers. In experimental group, participants received the quizzes via SMS, whereas in control group the participants took quizzes on paper. Both groups had only ten minutes to answer the questions.

Having finished the treatment (5 weeks, 10 sessions), students in both groups participated for the posttest. The researchers administered the pretest as posttest to see the effects of the treatment during the study.

At the end, the participants in experimental group were asked to fill out the attitude questionnaire again in order to find out whether their attitudes for the use of SMS in the retention of collocations have changed or not. This questionnaire consists of fifteen items. Each question was used to represent whether or not there is a positive response to the use of SMS in learning collocation. Items 7 and 9 were prepared to find out what improvements or modifications were needed for further researches.

V. RESULTS

In order to answer the research questions regarding the difference between the two different instructions, this study carried out four independent sampled *t*-tests and three paired sampled *t*-tests. Each *t*-test compared the difference of means between the two conditions in the case of collocations in language ability test, pretest and posttest in experimental and control groups.

TABLE 1.
T-TEST FOR INDEPENDENT SAMPLES OF PRETEST

Groups	N	M	SD	t	df	P
Cont.	20	11.25	4.327	-.548	38	.587
Exp.	20	11.95	3.734			

As shown in Table 1, participants in experimental group ($M = 11.95$, $SD = 3.73$) didn't outperform [$t(38) = -.548$, $p = .587$ (two-tailed)] those in control groups ($M = 11.25$, $SD = 4.32$). That means there is no significant difference between the groups at the beginning of the treatment and they are homogenized.

TABLE 2.
T-TEST FOR INDEPENDENT SAMPLES OF QUIZ 1

Groups	N	M	SD	t	df	P
Cont.	20	4.6	2.30	- 4.41	38	0.00
Exp.	20	7.35	1.56			

As Table 2 reveals, participants in experimental group ($M=7.35$, $SD=1.56$) significantly outperformed [$t(38) = -4.41$, $p = 0.00$ (two-tailed)] those in control group ($M = 4.6$, $SD = 2.30$) in quiz 1.

TABLE 3.
T-TEST FOR INDEPENDENT SAMPLES OF QUIZ 2

Groups	N	M	SD	t	df	P
Cont.	20	4.0	2.24	- 4.83	38	0.00
Exp.	20	7.35	2.13			

As Table 3 reveals, participants in experimental group ($M=7.35$, $SD=2.13$) significantly outperformed [$t(38) = -4.83$, $p = 0.00$ (two-tailed)] those in control group ($M = 4$, $SD = 2.24$) in quiz 2.

TABLE 4.
T-TEST FOR INDEPENDENT SAMPLES OF POSTTEST

Groups	N	M	SD	t	df	P
Cont.	20	19	6.22	- 8.75	38	0.00
Exp.	20	33.05	3.57			

As Table 4 reveals, participants in experimental group ($M=33.05$, $SD=3.57$) significantly outperformed [$t(38) = -8.75$, $p = 0.00$ (two-tailed)] those in control group ($M = 19$, $SD = 6.22$) in posttest section.

TABLE 5.
T-TEST FOR PAIRED SAMPLES OF CONTROL GROUP

Groups	N	M	SD	t	df	P
Cont.	20	11.25	4.32	- 9.75	19	0.00
Exp.	20	19	6.22			

As Table 5 reveals, after ten sessions of treatment, participants in control group ($M = 19$, $SD = 6.22$) significantly outperformed [$t(19) = -9.75$, $p = 0.00$ (two-tailed)] those before the beginning of treatment ($M = 11.25$, $SD = 4.32$). It can be concluded that control group developed learning collocations after receiving their definitions and example sentences on papers.

TABLE 6.
T-TEST FOR PAIRED SAMPLES OF EXPERIMENTAL GROUP

Groups	N	M	SD	t	df	P
Cont.	20	11.95	3.73	- 30.67	19	0.00
Exp.	20	33.05	3.57			

As Table 6 reveals, after ten sessions of treatment, participants in experimental group ($M = 33.05$, $SD = 3.57$) significantly outperformed [$t(19) = -30.67$, $p = 0.00$ (two-tailed)] those before the beginning of treatment ($M = 11.95$, $SD = 3.73$). It can be concluded that experimental group developed learning collocations after receiving their definitions and example sentences via SMS.

Seemingly, both groups (control and experimental) achieved collocation knowledge after receiving different treatment based on the research aims. But the results revealed the fact that experimental group significantly outperformed control group on collocation test, these results showed that SMS improved learners' collocation knowledge more effectively.

TABLE 7.
T-TEST FOR PAIRED SAMPLES OF ATTITUDE QUESTIONNAIRE SCORES

Groups	N	M	SD	t	df	P
Cont.	20	46.4	8.78	- 8.31	19	0.00
Exp.	20	65.2	4.22			

As Table 7 reveals, after ten sessions of treatment, participants in experimental group ($M = 65.2$, $SD = 4.22$) significantly had more positive attitudes [$t(19) = -8.31$, $p = 0.00$ (two-tailed)] than those before the beginning of treatment ($M = 46.4$, $SD = 8.78$). This illustrates a positive perspective toward learning via SMS.

VI. CONCLUSION

Based on the obtained results of this study, participants in SMS group could significantly outperform the ones in conventional/paper group, so SMS has effect on the retention of collocations among Iranian lower intermediate EFL learners. On the other hand, students have positive attitudes toward learning collocations via SMS. It was evidently shown in their posttest scores.

Besides, the findings of this study may have some hints for English teachers and educators. One of the effective implementation of mobile learning requires a pedagogical approach, identification of specific learning needs and goals. So, the teachers should be directly involved in decisions on planning and curriculum use (Perry, 2003). SMS can be a complementary teaching material that offers multiple learning opportunities. With support from technology advancement, other forms of SMS application in second language acquisition are around the corner, for example, quizzes via SMS and marking with immediate feedback, classroom monitoring and control using SMS, a classroom response system using SMS as a tool for conducting language activities, learning projects integrated with more 'game' elements (Naismith et al. 2005).

The second point is that the personal and collaborative nature of mobile devices can encourage participation and build social capital, which can be alternative instructional tool for learners of special needs, for example disengaged or at risk students. So, learning through SMS improves students' motivation and can involve them more actively and interactively.

The third point is that future technology developers should find ways to take advantages of m-learning to increase the students' exposure to the target language and ensure that this new learning is highly situated, personal, collaborative, and long term; in other words, truly learner-centered learning. Educators will need to adapt from a role as transmitters of knowledge to guiders of learning resources.

Finally, the anytime, anywhere capabilities of mobile devices encourage learning experiences outside of formal education. It should be mentioned that the beauty of this system is that the learning process takes place away from the classroom environment while the students are involved with their everyday activities. So, teachers can utilize SMS as a supporting learning tool to teach collocations and spend the constrained time of class to other skills such as listening or writing.

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