Impact of Mobile-Assisted Language Learning (MALL) on EFL Learners' Grammar Achievement and Self-Efficacy

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Abstract

This study was an attempt to find out the effect of a mobile learning program on EFL learners' grammar achievement and self-efficacy. For this purpose, 60 students from Haftvad institute located in Bam, Kerman were selected randomly from among a total number of 100 learners based on their performance on the Preliminary English Test (PET). Grammar pre-test questions and Sherer et al.'s (1982) self-efficacy questionnaire were distributed to these 60 participants and the participants and then they were randomly divided into two groups, experimental and control, each consisting of 30 EFL learners. Both groups were male and their age range was between 16-23 years old. The experimental group received their grammar lessons via Skyroom and Telegram while the control group had a routine teaching process in which no mobile-assisted applications were applied on this group. At the end of the study, after 14 sessions- treatment, grammar post-test, and self-efficacy questionnaires were given to two groups to evaluate whether there was any significant difference between these two groups or not. The design of the current study was quasi-experimental, pre-test, and post-test design. The type of test that was applied for this study was the independent sample t-test. The statistical analyses revealed that there was a significant statistical difference between the two groups' mean scores on the grammar post-test. However, there was no significant statistical difference between the two groups' mean scores on the self-efficacy post-test. As a result, it can be argued that a mobile program had a significant effect on EFL learners' grammar achievement, but a mobile program had no significant effect on EFL learners' self-efficacy level. The finding of this study had implications for EFL learners, teacher educators, and material developers.

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Introduction

Nowadays, we have to accept the fact that various kinds of technology are infiltrating themselves in front of us. According to Tekulve and Kelly (2013), among all innovations and technologies, utilizing mobile phones and their various applications has been recognized in language teaching and learning as a new approach. Most of the students have mobile phones with several facilities that can be used for acquiring a language. It can be a stable and attractive activity for students. Mobile learning can assist teachers to prepare materials and obtain responses from their students. Cavus and Ozdamli (2011) pointed out that since M- learning builds on the learner's interests, experiences, and needs, it places the students at the center of the learning process. Students, therefore, play an active role in acquiring knowledge.

Mobile devices could open new doors with their distinctive qualities such as "accessibility, personability, and portability" (Saran & Seferoglu, 2010, p. 253), and "the physical characteristics (e.g., size and weight), input capabilities (e.g., keypad or touchpad), output capabilities (e.g., screen size and sound capacities), file storage and retrieval, processor speed, and the low error rates" (Alzu'bi & Sabha, 2013, p. 179) in the teaching and learning processes. In the context of language learning, mobile devices are applied to facilitate language acquisition in formal and informal language learning settings. In fact, they have been the common devices used for educational objectives (Chinnery, 2019). Considering language learning, mobile devices have become an innovative learning platform for mobile learning or m-learning. Based on Kukulska-Hulme (2009), there is no obvious definition for mobile learning. This is due to trying to define "mobility" in that this word can refer to either mobility of the device or of the learner; both are equally essential when discussing m-learning.

The role of grammar is perhaps one of the most controversial issues in language teaching. In the early 20th century, grammar teaching formed an essential part of language instruction, so much that other aspects of language learning were either ignored or downplayed. According to Lin (2010), the role of grammar is to help students discover the nature of language, i.e., language consists of predictable patterns that make what the individuals read, say, hear and write intelligibly. As he stated, without grammar, people would have only individual words or sounds, pictures, and body language to communicate meaning. As Pajares (2002, p. 72) stated, one of the main efforts of language teachers is promoting learners' cognitive, behavioral, and motivational engagement

through enhancing students' self-efficacy. Self-efficacy is considered an important source of motivation for people. Bandura (1986) called self-efficacy as judgments of people about their ability to undertake their required roles in connection with a future position. Efficacy beliefs can influence individuals to become committed to realizing their desired outcomes successfully. People who have high confidence in their capabilities are considered to have a strong sense of efficacy. They don't take difficult tasks as obstacles to avoid, but instead, they take it as a challenge to develop their skills. They set challenging goals for themselves and commit to them, and they quickly recover their sense of efficacy if they failed in a task. As a result, the level of stress and anxiety is reduced; and the number of personal accomplishments is enhanced (Bandura, 1997). Taking into account the role of all mentioned factors, each of these attributes makes a piece of this research. The value and importance of new applications in the classrooms on the one hand and that's the effect on dependent variables on the other hand can equip us with a more comprehensive approach toward teaching language in the classrooms.

Today, every individual in society has access to a huge amount of information that was unimaginable some years ago, and "mobile technologies offer a new paradigm in connectivity, communication, and collaboration in our everyday lives" (McQuiggan, Kosturko, McQuiggan, & Sabourin, 2015, p. 7). In spite of the fact that the use of mobile applications has been on the rise during the last few years, so far to the best knowledge of the researcher, very limited research has been undertaken to evaluate the students' achievement and their self-efficacy beliefs toward mobile learning. Few studies investigated "students' personal use of mobile applications for learning and learning benefits" (Steel, 2012, p. 1). In this regard, Costa and Han (2017) explored the effect of using a mobile application on EFL learners' beliefs about language learning. The findings showed that students' opinions towards using such mobile devices and applications in classrooms are positive and they changed their beliefs about language learning. Likewise, Kashanizadeh and Shahrokhi (2021) examined the use of mobile to boost Iranian EFL learners' grammar knowledge: the case of grammar learning application in focus. The results indicated that participants in the experimental group performed significantly better in the post-test, demonstrating the effectiveness of the mobile application used in this study on learning grammar. Therefore, in order to cover the highlighted problems, in this study, the researcher decided to explore the effect of a mobile learning program on EFL learners' grammar achievement and self-

efficacy beliefs. In order to fulfill the purposes of this study, the following research questions were formulated:

Q1. What is the effect of a mobile learning program on the EFL learners' grammar achievement?

Q2. What is the effect of a mobile learning program on the EFL learners' self-efficacy?

This study holds significance in that the available literature on affective variables indicates the scarcity of research on the effect of a mobile learning program on the EFL learners' grammar achievement and self-efficacy. Thus, this is the motivation behind this study to focus attention on examining this effect. In line with what has been discussed so far, one of the major skills which learners need to learn and constantly improve is grammar knowledge. To achieve the best result from teaching grammar to learners, there is a need for more investigations that consider all the possible factors that may influence the learners' grammar achievement. Among these factors, considering different techniques, especially the use of technology in the classrooms is of great value. Also, there is evidence that the use of technology increases achievement and self-efficacy (Liu, Hsieh, Cho, & Schallert, 2006; Yang, 2020). The findings of this study can be considered as a framework for classroom instruction. Providing some useful information about the mobile program and their effect on students' self-efficacy level can be helpful to not only instructors, to plan their teaching methodology in a way that leads theoretically and practically to improving grammar knowledge, but it also can be of great importance to learners to learn the structures better, and more accurately in an enjoyable way by getting lots of information from their teammates through mobile. They would perhaps wish to know more about their degree of self-efficacy during their learning. The end-users of the results of the present study will clearly be teachers and material developers. The former may adapt their teaching approaches in a way that leads to better and more interactive grammar achievement by learners. The latter can provide learners with appropriate mobile application techniques on grammar achievement and also with the adaptation to experimental group with better self-efficacy level. As mentioned above, the significance of this study is naturally two-fold both teachers and learners can benefit from the results of this study. While teachers may contemplate applying the results in their own practice, learners would perhaps wish to learn more about their self-efficacy level prior to and during their learning and select

whichever procedure suits them best through research due to improving this construct in grammar achievement, as well.

Literature Review

Along with the rapid improvements in technology, mobile devices have become widespread in the last few decades. Today's language classrooms are vastly different from that of the mid - to late-20th century (Eaton, 2010). The focus on language education in the 21st century is no longer on grammar, memorization, and learning from rote, but rather on using language and cultural knowledge as a means to communicate and connect to others around the globe (Eaton, 2010). Traditional notions of education are giving way to newer, more innovative ways of thinking about how we learn, teach, and acquire knowledge. A formal definition provided by UNESCO (2014) states that mobile learning involves the use of mobile technology, either alone or in combination with other information and communication technology (ICT), to enable learning anytime and anywhere. Another simple definition was provided by Quinn (2000 as cited in Eteokleous & Laouris, 2005), stating that mobile learning is learning which takes place with the assistance of mobile devices. In line with this definition, many authors also shed light on the technological aspect while identifying m-learning because they consider this new technology as a "pervasive medium that may assist us in combining work, study, and leisure time in meaningful ways" (cited in Eteokleous & Laouris, 2005, p. 2). For instance, Geddes (2004, as cited in Baleghizadel & Oladrostam, 2010) believed that mobile learning can be identified by the availability of the tools used. He also added that, regardless of time and location, mobile learning is about the acquisition of knowledge and skills through the use of mobile devices (cited in Ticheler, 2010). Another emphasis is on the functionality of the devices themselves. Baleghizadel and Oladrostam (2010) claimed that mobile learning involves the use of any portable learning materials, including audio cassettes, audio CDs, portable radios, and DVDs players, concentrating on recent technologies. Hence, the main characteristic of mobile learning is the digital tools and their novelty. Therefore, the portability of the mobile device should be taken into consideration to facilitate the learning process Commonly, as stated in the Global Encyclopedia of Information, m- learning refers to learning opportunities through the use of mobile solutions and handheld devices, such as smartphones and PDAs, that are connected to information networks, or what Tomei (2008)

assumed to call "the opportunity to 'learn on the go'" (p. 581). Thus, m- learning offers new ways of learning due to the various digital devices used. So, a number of research studies on MALL and mobile learning were examined on sub-skills and presented in chronological order as follow:

Rahimi and Soleymani (2015), worked on the impact of mobile learning on EFL learners' listening anxiety and listening comprehension. The results of data analysis showed that the listening anxiety of the experimental group reduced significantly after the experiment. Further, a significant difference between the experimental and control groups' listening comprehension was found in favor of the experimental group at the end of the experiment.

Abbassi Ghadi and Khodabakhshzadeh (2016) explored the effect of employing electronic peer assessment on Iranian EFL learners' writing ability and autonomy. Results of data analysis indicated the experimental group's outperformance in both the writing and autonomy scale administered at the end of the study. Results of qualitative data (interview), also, showed that these participants had positive beliefs about employing electronic peer assessment.

Khodabandeh, Alian, and Soleimani (2017) examined the effect of MALL-based tasks on EFL learners' grammar learning. Based on the post-test results, the results showed that the experimental groups had better performance than the control group. The study supports the hypothesis that sharing tasks in virtual networks can have positive results for language learning, specifically grammar learning.

Hazaea and Alzubi (2018) worked on the impact of mobile-assisted language learning on learners' autonomy in the EFL reading context. The data analysis revealed that the participants' LA is improved through the use of selected mobile applications in terms of taking responsibility for and making decisions about reading materials and the time and place of reading.

Kacetl and Klímová (2019) studied the use of smartphone applications in English Language learning- A challenge for foreign language education. The results reveal that mobile learning is becoming a salient feature of education as it is a great opportunity for foreign language learning. Its key benefits are as follows: the enhancement of the learner's cognitive capacity, the learner's motivation to study in both formal and informal settings, the learner's autonomy and confidence, as well as the promotion of personalized learning, helping low-achieving students to reach their study goals.

Ghorbani and Ebadi (2020) explored the learners' grammatical development in mobile-assisted language learning. The results indicated that using chats in Telegram led to a significant development in learners' grammatical accuracy in the experimental groups. Semi-structured interviews were conducted to explore the learners' attitudes towards their experience in the MALL immersion program. The thematic analysis used to analyze the qualitative data revealed a number of themes that addressed the learners' positive perceptions towards using MALL applications to develop their grammatical structures in online chats.

Refat, Kassim, Rahman, and Bin Razali (2020) worked on measuring student motivation on the use of a mobile-assisted grammar learning tool. The findings showed that with the effective design of instructional materials, students were motivated to learn grammar, where they were positive at improving their attitude towards learning (male 86%, female 80%). The IMMS findings revealed that students' motivation increased after using the tool. Moreover, students improved their performance level which was revealed from the outcome of the paper-based instrument.

Almadhady, Haji Salam, and Baharum (2020) studied the motivation of Arab EFL university students towards using Mall applications for speaking improvement. The results showed that the students are motivated to use the MALL application for speaking improvements due to the ease of use and the usefulness of these applications. The students' motivation is supported by many reasons such as MALL accessibility, availability, enjoyment, variety of learning styles, and flexibility in learning.

Kashanizadeh and Shahrokhi (2021) examined the use of mobile to boost Iranian EFL learners' grammar knowledge: the case of grammar learning application in focus. The results indicated that participants in the experimental group performed significantly better in the post-test, demonstrating the effectiveness of the mobile application used in this study on learning grammar. According to studies, the other researches aimed at investigating the effect of mobile technologies on EFL learners' sub-skills. But they did not mention this gap. So, in this study, the researcher decided to explore the effect of a mobile learning program on EFL learners' grammar achievement and self-efficacy beliefs.

Method

This study with a random selection of the participants based on convenient sampling and the random assignment of them to two control and experimental groups was a quasi-experimental

research study. The design of this research was pre-test and post-test design. The dependent variables (DV) of this research were grammar achievement and self-efficacy while the independent variable (IV) was mobile learning program. The participants of the study were intermediate male learners, therefore; gender and language proficiency were regarded as control variables. To fulfill the objectives of this study, 100 males intermediate EFL learners with the age range of 16-23 studying at Haftvad institute located in Kerman, participated in this research. To make sure that the present study enjoys the needed appropriateness, the researcher applied these instrumentations:

1. Preliminary English Test (PET)
2. A questionnaire of self-efficacy by Sherer et al's (1982)
3. Coursebook: *American English File 2* by Oxenden, Latham-Koeing, and Seligson (2008)
4. Grammar achievement pre-test and post-test of American *English File 2* by Oxenden, Latham-Koeing, and Seligson (2008)
5. English grammar in use (fifth edition) by Raymond Murphy (2019)

The Preliminary English Test (PET) adopted from PET Practice Tests by Jenny Quintana (2004), Oxford University Press, was administered to homogenize the participants of this study (at the outset of the study. It is a standardized, reliable, and valid test. The original package consisted of two papers Reading, Writing, and Listening, and one speaking section at the end, but it is worth mentioning that the speaking part had not been administered due to time restrictions.

The first paper consisted of reading and writing questions with 90 minutes as the total time, it was administered one week after the administration of the critical thinking questionnaire. The reading section focused on five parts with 35 questions and the writing section focused on two parts with 6 questions. The second paper consisted of listening questions, and students were supposed to answer these questions in 30 minutes plus six minutes of transfer time. This section focused on four parts with 25 questions. It should be noted that the intermediate participants were selected based on their scores which fell one standard deviation above and below the mean of their PET scores.

Sherer, Maddux, Mercandante, Prentice-Dunn, Jacobs, and Rogers (1982) developed the GSE scale to measure "a general set of expectations that the individual carries into new situations". The SGSES has been the most widely used GSE measure. The SGSES was primarily developed for clinical and personality research. Later it has also been used in organizational settings. Reviewing

various organizational studies, Chen, Gully, & Eden (2001) found internal consistency reliabilities of SGSES to be moderate to high (α = .76 to .89). However, Chen et al found high test-retest reliability (r = .74 and .90). The validity, just like reliability, is a positivist requirement. It means that a valid instrument should gather what it is supposed to gather or it is actually measuring what it is intended to measure. For the validity of the questionnaire, two experienced professors as the experts in this field observed the items before it was administered, and they did not report any irrelevant points. They have also reported high validity in fulfilling the research objectives.

The questionnaire is a Likert format 17-item scale. The Sum of item scores reflects general self-efficacy. The higher the total score is, the more self-efficacious the respondent. The scores range from 17 to 85. The tests were also piloted on 10 participants who had the same characteristics as the main participants of the study. A test of grammar was made by the teacher involving 40 pre-test questions and 40 post-test questions from the book "American English File 2" by Oxenden, Latham-Koeing, and Seligson (2008), and English grammar in use (fifth edition) by Murphy (2019) which was used as the material for the treatment. In fact, both tests were extracted from the books which were standard and valid. The questions were out of context in the form of multiple-choice questions and each item was given one point. The time allocated to each test was 40 minutes. Pre-test was administered 4 days after the administration of PET and post-test was administrated in the last session of the treatment. The tests were also piloted on 30 participants who had the same characteristics as the main participants of the study. The main textbook in this study was *American English File2* by Oxenden, Latham-Koeing, and Seligson (2008). This book consists of nine files and each of them is divided into four lessons of A, B, C, and D and contains different tasks and exercises for all the four skills of listening, speaking, reading, and writing. American English File helps learners develop their language skills. One way it does this is with a strong focus on grammar, pronunciation, and vocabulary skills. In this study, the first three chapters of this book were covered, and covering each chapter lasted for four sessions. To achieve the purpose of the study, the researcher conducted the following procedure:

The researcher first administered the sample PET among a group of 30 EFL learners with similar characteristics to the representative sample in order to make sure that the test had appropriate items and test characteristics. Moreover, Cronbach's Alpha was also run prior to the main administration to ensure the reliability of the test.

After piloting PET, it was administered to 100 intermediate level students in Haftvad institute located in Kerman, who were selected randomly and 60 students whose score fell between one standard deviation above and below the mean were chosen as the final participants of the study. In order to investigate the null hypothesis of the research study, the researcher distributed the self-efficacy questionnaire and grammar pre-test among these 60 participants and let them fill it out. Participants were randomly assigned into control and experimental groups. The duration of the treatment was 14 sessions in which one session was for making students familiar with mobile-assisted application techniques and the last section was devoted to administering the self-efficacy questionnaire and grammar post-test. Each session lasted for 90 minutes.

The control group received the traditional grammar instruction. The teacher provided them with some information about the English tenses, passive sentences, modal verbs, linking words, comparative/superlative adjectives, explicit instructions on the outline, and the general format of texts. Also, the teacher didn't use any mobile programs in this group, and used of routine teaching method for grammar achievement by answering questions strategy in this class; and learners were encouraged to monitor their learning. In the experimental group, however, the same set of topics in grammar lessons in the control group was instructed based on mobile-assisted application techniques. In this class, the Live Learning Program on Skyroom was used in the current study which facilitates the benefits of online learning to the language learners from the idea of sharing and using networking opportunities within the program. It is widely respected in the field of language teaching as a part of the online environment and creates a live non-threatening classroom atmosphere with various enjoyable tasks and authentic materials, unlike the traditional ones.

First of all, students were provided with some information about the nature and goal of using the mobile-assisted application and also how to use Skyroom and Telegram during the semester. Before each session, the instructor activated the webcam and asked the learners to activate their microphones for answering or asking questions. At the first step, the teacher divided the participants into ten groups, each group including three learners for group working and started teaching. He wrote grammar points on the board and explained them and asked some questions from the students to evaluate their weak points. At the end of the teaching, the teacher assigned the homework for students and for grouping work asked them to write 6 sentences about this session's grammar for the next session. After class, the learners in each group had an online

interaction with each other through Telegram and consultation with their friends about writing the sentences. Participants in each group also had interaction with their teacher ask their questions and sending the homework through Telegram. The teacher read the sentences of every group and gave comments if it was necessary and send their texts by Telegram. After revising, all groups shared their sentences with their classmates. After 14 complete sessions these two groups, the participants in both control and experimental groups were given the self-efficacy questionnaire and grammar post-test questions, to measure the effect of a mobile learning program on grammar achievement and self-efficacy.

Results

In order to test the hypotheses, the researcher conducted a series of calculations and statistical routines that are elaborated comprehensively. Both descriptive and inferential statistics were utilized in the process, details of which are presented below.

PET Main Administration

The following table shows the descriptive statistics of the PET test.

Table 1

Descriptive Statistics of PET Main Administration

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std.Error
PET	100	33.00	36.00	64.00	47.8556	9.55241	91.249	-.335	.254
Valid N (listwise)	100								

According to Table 1, the mean turned out to be 47.85 and the standard deviation was 9.55. Consequently, among the 100 original students, 60 students whose PET scores fell between one standard deviation above and one standard deviation below the mean were chosen as the homogenized sample of the study.

Analysis of the First Research Question

Research question one was an attempt to investigate the effect of a mobile learning program on EFL learners' grammar achievement. In doing so, the two groups' mean scores on pre-test and post-test were submitted to independent sample t-test. Results are presented in the following table.

Results of the Grammar Pre-test

In the following section, results of the grammar pre-test including descriptive statistics and inferential statistics are presented to check whether the groups were homogenous at the onset of the study.

Table 2

Descriptive Statistics of Control & Experimental Groups' Mean Scores on Grammar Pre-test

	Groups	N	Mean	SD	SEM
Grammar (pre-test)	Control	30	17.53	3.36	.613
	Experimental	30	18.60	2.72	.497

As it is shown in the above table, the mean scores on the control and experimental groups are 17.53 and 18.60, respectively. The standard deviations of the two groups are 3.36 and 2.72. To see whether the means were statistically different, the means were submitted to an independent samples-t-test. Results are presented in Table 3.

Table 3

T-test for Comparing the Participants' Grammar Score before the Treatment

		Levine's Test		t-test		
		F	Sig.	t	df	p
Grammar	Equal variances assumed	.002	.960	-1.35	58	.182
	Equal variances not assumed			-1.35	55	.182

As it is shown in the above table, the variances of the two groups were equal (F=0.002, p= 0.96 > 0.5); therefore, the data in the first row in the above table are reported. The results, as shown in the above table (equal variances assumed) indicate that there was no statistical difference between the two groups' mean scores on the grammar pre-test (t= -1.35, df= 58, p= 0.18> 0.05). As a result,

it can be argued that there was no initial difference between control and experimental scores on grammar pre-test and they were homogeneous.

Results of the Grammar Post-test

In the following section, a summary (descriptive statistics) of the groups' scores on the grammar post-test is presented.

Table 4

Descriptive Statistics of the Groups' Scores on Grammar Post-test

	Groups	N	M	SD	SEM
Grammar	Control	30	19.3	2.17	.34
	Experimental	30	22.9	2.15	.38

As is shown in Table 4, the mean scores of the control and experimental groups are 19. 3 and 22.9, respectively. The standard deviations of the two groups are 2.17 and 2. 15. To see whether the means were statistically different, the means were submitted to an independent samples-t-test. Results are presented in Table .5.

Table 5

T-test for Comparing the Groups' Means on Grammar Post-test

		Levene's Test		t-test for Equality of Means		
		F	Sig.	t	df	P
Grammar	Equal variances assumed	.052	.821	-6.434	58	.001
	Equal variances not assumed			-6.434	57.971	.001

As it is shown in the above table, the variances of the two groups were equal (F=0.052, p= 0.82 > 0.5); therefore, the data in the first row in the above table are reported. The results, as shown in the above table (equal variances assumed) indicate that there was a significant statistical

difference between the two groups' mean scores on the Grammar post-test (t= -6.43, df= 58, p=0.001> 0.05). As a result, it can be argued that the null hypothesis was rejected favoring the experimental group and mobile program had a significant effect on EFL learners' grammar achievement.

Analysis of the Second Research Question

Research question two addressed investigating the effect of the mobile program on improving EFL learners' self-efficacy level. In doing so, the two groups' mean scores on pre-test and post-test were submitted to independent samples-t-test. Results are presented in the following sections.

Results of the Self-Efficacy Pre-test

Results of the self-efficacy pre-test including descriptive statistics and t-test are presented in the following tables.

Table 6

Descriptive Statistics of the Two Groups' Mean Scores on Self-efficacy Pre-test

	Groups	N	Mean	SD	SEM
Self-efficacy Pre-test	Control	30	89.50	8.63	1.57
	Experimental	30	88.26	9.46	1.72

As is shown in Table 6, the mean scores of the control and experimental groups are 89.5 and 88.26, respectively. The standard deviations of the two groups are 8.63 and 9.46. To see whether the means were statistically different, the means were submitted to an independent samples-t-test. Results are presented in Table 7.

Table 7

T-test for Comparing the Groups' Scores on Self-Efficacy Pre-test

		Levene's Test		t-test		
		F	Sig.	t	df	P
Self-efficacy 1	Equal variances assumed	.149	.701	.527	58	.600

Equal variances not assumed	.527	57.5	.600

As it is shown in the above table, the variances of the two groups were equal (F=0.14, p= 0.70 > 0.5); therefore, the data in the first row in the above table are reported. The results, as shown in the above table (equal variances assumed) indicate that there was no statistical difference between the two groups' mean scores on the self-efficacy pre-test (t= 0.52, df = 58, p=0.60> 0.05). As a result, it can be argued that there was no initial difference between control and experimental scores on self-efficacy pre-test and they were homogeneous.

Results of the Self-Efficacy Post-test

In order to see whether the mobile program had a significant effect on improving EFL learners' self-efficacy level, the two groups' means on the self-efficacy post-test were submitted to an independent samples-t-test. Results are presented in the following tables.

Table 8

Descriptive Statistics of the Groups' Scores on Self-Efficacy Post-test

	Groups	N	Mean	SD	SEM
Self-Efficacy Post-test	Control	30	89.83	8.24	1.50
	Experimental	30	92.93	8.56	1.56

As is shown in Table 8, the mean scores of the control and experimental groups are 89.83 and 92.93, respectively. The standard deviations of the two groups are 8.24 and 8.56. To see whether the means were statistically different, the means were submitted to an independent samples-t-test. Results are presented in Table 9.

Table 9

T-test for Comparing the Groups' Scores on Self-Efficacy Post-test

		Levene's Test		t-test		
		F	Sig.	t	df	p
Self	Equal variances assumed	.363	.549	-1.429	58	.158

Post-test	Equal variances not assumed	-1.429	57.9	.158

As is shown in the above table, the variances of the two groups were equal (F=0.363, p= 0.549 > 0.5); therefore, the data in the first row in the above table are reported. The results, as shown in the above table (equal variances assumed) indicate that there was no significant statistical difference between the two groups' mean scores on the self-efficacy post-test (t= -1.42, df=58, p=0.15> 0.05). As a result, it can be argued that the null hypothesis was accepted. Therefore, mobile programs had no significant effect on EFL learners' self-efficacy level.

Discussion

This study was carried out to investigate the effect of a mobile learning program on EFL learners' grammar achievement and self-efficacy. To do this, two research questions and two null hypotheses were raised. In order to provide an answer to the research questions and test the null hypotheses, the following procedure was carried out.

After administering the PET proficiency test (Preliminary English Test) to the 100 male EFL learners, 60 participants were chosen based on their scores which fell one standard deviation above and below the mean. After the homogenization, the researcher distributed the grammar pre-test and self-efficacy questionnaire among these 60 participants and let them fill it out. After that, participants were randomly assigned into control and experimental groups. The main purpose of this study was to explore the possible effect of a mobile learning program on EFL learners' grammar achievement and their self-efficacy level. Various statistical analyses including descriptive and inferential statistics were carried out to fulfill such purposes.

In order to check for any significant difference between the grammar and self-efficacy mean scores and ensure the homogeneity of the two groups in terms of the dependent variables of the study, an independent samples t-test was run on the grammar pre-test scores and self-efficacy pre-test scores of the participants in both groups. The result showed that there was no initial difference between control and experimental scores on grammar and self-efficacy pre-test and they were homogeneous. Also, to find the significant difference between the grammar and self-efficacy post-test scores of the two groups, an independent sample t-test was run on the grammar and self-efficacy scores of the participants. The result showed that a mobile learning program had a

significant effect on EFL learners' grammar achievement; however, results about the self-efficacy post-test scores showed that a mobile learning program had no significant effect on EFL learners' self-efficacy level.

According to the available statistical analyses, the first null hypothesis (H01) is rejected and it can be argued that mobile program significantly affects and contributes to learning grammar skill by Iranian EFL learners. However, the second null hypothesis (H02) is accepted and it can be argued that mobile programs had no significant effect on Iranian EFL learners' self-efficacy level.

Additionally, there is an agreement with some studies that illustrated positive attitudes and self-efficacy among students of elementary school (Tsai et al., 2010), high school (Wang & Wang, 2008; Poll, 2014), as well as among college students (Yang, 2012; Mnaathr et al., 2013, Sung et al., 2016). There is also an agreement with these studies regarding the remarkable relationship between EFL learners' views and their self-efficacy in using mobile devices.

There are some studies in support of mobile language learning. For example, Kashanizadeh and Shahrokhi (2021) examined the use of mobile to boost Iranian EFL learners' grammar knowledge. The results indicated that participants in the experimental group performed significantly better in the post-test, demonstrating the effectiveness of the mobile application used in this study on learning grammar. Likewise, Ghorbani and Ebadi (2020) explored the learners' grammatical development in mobile-assisted language learning. The results indicated that using chats in Telegram led to a significant development in learners' grammatical accuracy in the experimental groups. Moreover, Ozer and Kılıç (2018) investigated the effect of mobile-assisted learning environments on academic achievement, acceptance of mobile learning tools and cognitive load of EFL students and their findings revealed a significant difference in academic achievement and mobile learning tools acceptance level of students in favor of the experimental group. In some other studies by Laban (2017), Emekci (2016), Pratama (2015), and Komara (2014), the positive effect of using mobile learning on students' achievement was observed. In all, the findings revealed that there were statistically significant differences in learning English between both groups in favor of the experimental group. This could be attributed to using Mobile Learning applications in teaching language skills. moreover, an increase in motivation to learn using mobile devices is supported by a range of studies, including work by Ciampa (2013), Rogers (2011), Huang, Lin, and Cheng (2010). Besides, Baleghizadeh and Oladrostam (2010) examined the effect of Mobile

Assisted Language Learning (MALL) on the grammatical accuracy of EFL students and the findings indicated that the participants who had benefited from mobile-assisted learning had a significantly better performance on a multiple-choice grammar post-test than the participants in the control group. However, the results of this study are not in favor by Froese et al., (2012) revealed that students who freely texted during the lesson scored much lower than those who muted their phones during instruction. Also, the results of this work have not supported the findings of Salaberry (2001), who pointed out that mobile phones are not effective tools for learning.

In the second objective of the study, the findings showed that mobile programs hadn't significant effect on EFL learners' self-efficacy level. Therefore, the related null hypothesis is accepted and mobile programs had no significant effect on EFL learners' self-efficacy level. In this regard, Meshkat and Mohammadpour (2019) analyzed the effect of a reading application on the reading comprehension and reading self-efficacy of language learners. The results of one-way between-groups MANOVA revealed that independent reading using the reading application positively and significantly affected the learners' reading comprehension and reading self-efficacy. Also, Yang (2020) studied a study on self-efficacy and its role in mobile-assisted language learning. This research is conducted only through literature summary and some talks and interviews, more empirical studies need to be conducted to further research the role that self-efficacy plays and its correlation with MALL.

Conclusion

This study examined the effect of a mobile learning program on EFL learners' grammar achievement and their self-efficacy. Regarding the effect of mobile learning on EFL learners' grammar, results verified that mobile programs had a significant effect on EFL learners' grammar achievement. In fact, the result showed that the students' grammar achievement can benefit from mobile programs more than the students learn grammar with the traditional method. In other words, the experimental group outperformed the control group on the grammar achievement, thus the related null hypothesis is rejected. It can be argued that mobile phones could play a crucial part in improving the grammatical knowledge of EFL students. It was finally concluded that the treatment (mobile program) had been a successful one in fostering the grammatical accuracy of the EFL learners.

On the contrary, the results of the second question showed that mobile programs had no significant effect on EFL learners' self-efficacy level. That is to say, there was not a remarkable difference between the self-efficacy's mean scores of the participants in the control and experimental groups. The researcher thinks that the result is more or less logical because it is apparent that the students with high self-efficacy and high self-confidence can make use and benefit from any method and any approach. It is worthy to note that when students enjoy using the mobile learning tools for retrieving online content and for gathering online resources, they like to keep using them. The more interested the students are in learning through mobile phones, the more likely for them to achieve better performance.

With the popularity and wide use of mobile devices, it is inevitable that they are applied in the teaching and learning environment. Despite their flexibility and fast feedback in facilitating mobile-assisted language learning, special emphasis should be put on the learners' views and experiences to help them obtain a sense of fulfillment. Self-efficacy, especially technology self-efficacy, can play a remarkable role in realizing this. Such a new method proves to be a key feature of influential teaching and learning context. Therefore, teachers are invited to shift from the conventional methods and adopt innovative ones. Providing support and assistance to students through applying innovative methods could enhance their learning.

On the whole, good technology should attract users to keep using it. In Mobile-assisted Language Learning, teachers, learners, and administrators should consider this factor in an educational setting for a better result of such a program. This work can help teachers to provide better design mobile-assisted learning environments. Educators teaching grammar with technology face a growing number of choices. Regardless of which choices are made, however, using technology to teach grammar will be most effective when the technology is integrated into the curriculum, course, and lesson. The findings of this study, along with those of previous studies, can help a diversity of professions concerned with language teaching and learning. Among all, teachers, syllabus designers, material developers, and learners can be named.

Before the Coronavirus, the setting of classes in Iran perhaps does not support online instruction by mobile and they mostly focus on the grammar exercises of the approach which is applied in each language school. Students perhaps may not be ready enough to embrace fully mobile instruction. Hence, for improving the grammar skill which is one of the important skills in

language learning, building the capacity of students for embracing these applications is required. Teachers need to become aware of the features and benefits of mobile-assisted language learning and implement this technique in their classrooms. Implementing new teaching techniques will not only help learners to better learn the language but also help teachers gain new experiences and become more professional in their careers. Moreover, teaching by mobile programs to the learners can help teachers themselves to gain personal development. The outcome of this study can help syllabus designers and material developers to have more effective and motivating grammar tasks. They can engage learners in exercises and activities that incorporate online instruction by mobile. In addition to EFL teachers and syllabus designers, language learners are required to play their role properly in order to facilitate and optimize learning. Online instruction by mobile provides learners with a different viewpoint of their experiences from the world, and an individual way to set and achieve their goals. Therefore, the results of the current study have implications for language learners, encouraging them to become more conscious, active, and evaluative about their best learning styles; particularly a mobile program as a beneficial learning tool.

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