Original Article

The Effect of Mnemonic Technique and Digital Game-Based Task on Teaching Vocabulary to Iranian EFL Students through Distance Education

Seyed Abdolmajid Tabatabaee Lotfi [*1], Zeynab، Heidari [2] , Amir، Sarkeshikian [3]

1. Assistant Professor of English Language Faculty, Qom Branch Islamic Azad University, Qom, Iran
2. Master of English Language Department, Qom Branch, Islamic Azad University, Qom, Iran
3. Assistant Professor of English Language Faculty, Qom Branch Islamic Azad University, Qom, Iran

Abstract

The purpose of this study was to provide additional research to investigate the effects of mnemonic techniques and digital game-based task on teaching vocabulary to Iranian EFL students through distance education. To that end, a quasi-experimental research method with a pretest posttest non-equivalent control group design was used. The participants of the study were 75 pre-intermediate EFL learners and were chosen from among female learners. After homogenizing the participants through the Oxford Placement Test (OPT), the vocabulary knowledge test (VKS), developed by Wesche and Paribakht (1996), was used as the pretest and the posttest. For measuring the reliability of the test, it was piloted with thirty students who were similar to main sample of the study, which was found to be acceptable in terms of Cronbach's alpha. The only difference between the pretest and posttest was the order of the items to diminish the practice effect. Then the participants were randomly divided into three equal groups of 25 (two experimental groups and one control group). During a 30-day teaching period, students in the experimental groups were taught English vocabulary using mnemonic and digital game while students in the control group were taught lessons using the traditional methods. After 7 sessions, a posttest of vocabulary was administered. Results of data analysis showed that mnemonic and digital game-based task techniques had a significant effect on teaching vocabulary to Iranian EFL students through distance education. However, no statistically significant difference was found between the effects of the two techniques. The findings of this research may have implications for EFL learners, teachers and curriculum designers.

Introduction

Recently, Interest in learning foreign languages in general and English language in particular is growing daily. English language has established itself as the international language and a means of communication among people across the world. Words are the building blocks of every language without which one is quite speechless. Vocabulary learning is central to language learning and it is very significant to language learners. Words are a central part of a language since they label objects, actions, and ideas without which people cannot convey the intended meaning. It is generally agreed that an important part of learning a foreign language is learning its vocabulary [1]. Because of the growing awareness of the importance of vocabulary and vocabulary learning, many studies tried to deal with different vocabulary learnings strategies [2,3,4]. Some of these vocabularies learning strategies achieved high levels of popularity at different times but then were replaced by other strategies which were claimed to be based on newer or more appealing ideas and theories.

According to Nation [5], "what learners do while studying words are more important than how motivated they are, how hard they work, how much time they spend and the number of repetitions

of each word" (p. 25). This simple statement can vividly confirm the importance of applying strategies in learning new vocabulary items. Therefore, it is obligatory to make an attempt to capitalize on proper strategies, techniques and tasks that may bring about desirable vocabulary gains to second language learners [6].

Recently, digital, serious games are receiving increasing attention by different researchers and practitioners in different parts of the world in educational settings [7, 8, 9, 10]. Considering the importance of vocabulary in learning a second language using attractive ways to encourage students to learn more words seems to be necessary. Since, a great number of words might be acquired incidentally; computer games might be used as potential tools to provide more opportunities for learners to learn words while they are engaged in other activities. Creativity, innovation, and sense of competition in these games may give learners some sort of encouragement to incidentally acquire the words used in those games. In this kind of learning, they not only enjoy the games but also the users try to guess the meaning of words and memorize them. The present study aimed to investigate if using a digital game is effective in learning incidental vocabulary among Iranian EFL learners [11].

On the other hand, there are many English teachers did not apply the appropriate method for teaching vocabulary yet. The English teacher tended to apply old school methods where the students asked to translate and memorize the meanings directly. It makes them feel secure and their creativity did not develop. Whereas, Creativity is one of the important factors affecting students in learning English. Because of that, the students felt unmotivated in joining the English class and they only can memorize the vocabulary in short time. So, it is important for a teacher to be creative and innovative in teaching vocabulary.

One of the techniques that teacher can used is "Mnemonic Method". It is essential for EFL/ESL teachers to be aware of the effectiveness of different methods of vocabulary teaching to choose the ones that are the most effective for their students. For example, one such strategy could be the use of mnemonics. There is a direct relation between using mnemonic strategies and facilitating memory for better learning [12]. The rationale behind using these strategies is that by meaningfully integrating new information with schema, processing and retrieving information will be easier [12]. Mnemonics are basic kinds of associations or strategies used by learners to increase the retention and retrieval of lexical items [13]. Mnemonic strategies are, in fact, memory enhancing instructional strategies that involves teaching students to link new information taught to information they already know. Hence, mnemonic techniques and digital game-based task used in this research in order to find out their effectiveness on EFL vocabulary achievement through distance education. The main research objective of this study was to identify the impacts of using mnemonic techniques and digital game-based task on teaching vocabulary to Iranian EFL students through distance education.

Many teachers have tried to find ways to motivate students to learn more vocabulary, and the mnemonic technique and digital game-based task might be the answer. In order to prove the effectiveness of the mnemonic technique and digital game-based task in various circumstances and show how them helps learners retain the words in their memory, a great deal of studies have been conducted [14, 2, 15, 16, 17].

In spite of the abundance of research, many issues regarding the way learners acquire vocabulary and the most appropriate way to teach words still remain unresolved [18]. Therefore, still there appears to be a need for further investigation filling the remained gaps in this area. The researcher wants to know the effective techniques and tasks in teaching English for the basic EFL. Accordingly, the purpose of this study was to provide additional research to investigate the effects of mnemonic techniques and digital game-based task on teaching vocabulary to Iranian EFL students through distance education.

Oral proficiency has always been seen as the ultimate goal of any language student by both teachers and students. On this basis, it is usually assumed that someone who is unable to properly

convey their ideas and have a conversation with others cannot be called a speaker of the target language. Following constructivist theories of language acquisition, it is concluded that language evolved primarily from social interaction after observing how children interact with them and with adults [19]. In addition, they claimed that these interactions helped develop their cognitive understanding. Hence, it can be implied that this is the key to developing language and cognition in the classroom.

Among various aspects of L2 knowledge (e.g., L2 grammar knowledge, L2 pragmatic knowledge, L2 literacy), L2 vocabulary knowledge has been recognized as one of the most important aspects of L2 knowledge [20]. Recognizing and knowing the meaning of individual words from speech is an essential foundation for developing other skills as well [21]. In addition, word association knowledge and morphological awareness (two aspects of vocabulary knowledge) have significant correlations with L2 reading and L2 listening [22].

In an educational context, the main educational purpose of speaking is defined not only as the most difficult skill to develop in many classrooms, but also as "sharing information already known and checking student knowledge" [23, p 77], which has led to the misunderstanding that classroom communication is not authentic. This has been proven wrong, however, it has been found that the patterns of interactions in the classroom were similar to those between mothers and children [23]. After all, language teaching can actually provide opportunities for real interaction, such as when asking for clarification or exchanging opinions. It would be up to the teacher to create these opportunities to use the target language in different ways.

Interaction in the classroom has been defined as a mutual process between the participants in the learning process [24]. It is claimed that students engage in the teaching and learning process through classroom interaction [25]. This means that classroom interaction encourages students to participate. In addition, classroom interaction is not just about participating in the teaching and learning process and sharing their knowledge about a material, but also about a relationship between students and teachers in the classroom. There are also some studies on classroom interaction. An analysis of the IRF (Initiation-Response-Feedback) was done on interaction in the classroom in the EFL class [26]. This study aimed to analyze the reflection of IRF (Initiation-Response-Feedback) in speaking classes and to examine the dominant sequence between I, R and F. The result of this research was that the student's response became the dominant sequence of IRF in the classroom.

The term mnemonic had its origins in the ancient Greek word Mnemon which has the meaning mindfulness [27]. The ancient Greeks had effectively recognized two different types of memory, one that was inborn and "natural" and another that was "artificial" and prepared by means of mnemonic techniques. It is believed that mnemonic is an instructional strategy, techniques or devices intended to help students enhance their memory of vital information that includes teaching students to connect the new data to the information that they already know [28].

As Oxford [29] stated, memory techniques, often referred to as mnemonics, have been used for thousands of years. She gave the example of orators in ancient times who could recall a long speech by connecting various sections of speech with different rooms of a house or temple and then talking a walk from room to room, but people forget their previous dependency on memory strategies after literacy became common.

Mnemonics as aids to memory has fascinated philosophers, psychologists, teachers and learners ever since antiquity [30]. Mnemonic devices in foreign language learning in modern times were boosted by a whole robust line of research [28, 31]. The presupposition underlying this tradition is very simple: a) mnemonic devices work miraculously in boosting memory, b) vocabulary learning is essentially a memory issue, c) mnemonics should work for foreign language vocabulary learning as well.

 One of the most studied mnemonics is the keyword method, a sound-alike native word, through an interactive image that involves both the foreign word and native word [31]. A verbal

version of the keyword method differs from the imagery version only at the last stage, where, instead of an interactive image, a sentence is made up in the learner's L1 that involves the keyword and the L1 equivalent "doing something together". It is hoped that the stimulus of the foreign word would trigger the activation of the sound-alike keyword, which would in turn activate the interactive image or sentence, resulting in the retrieval of the real meaning.

Comprehensive reviews exist on the effectiveness of mnemonic techniques in foreign language vocabulary learning:

1) Mnemonic devices mainly aim for the retention of paired-associates.
2) The mnemonic approach to vocabulary development emphasizes on a fixed one-to-one relationship between form and meaning.
3) Mnemonic techniques tend to focus on the referential meaning of a word, often at the expense of its grammatical information. As a result, mnemonic devices may not necessarily cost-effective in the long run if word use in natural contexts rather than meaning retention is the final aim.
4) Mnemonic devices might be more applicable at different stages of learning. They might benefit absolute beginners who need to remember a large number of fairly arbitrary paired-associates or advanced learners whose target language system has already been established.
5) Learners of a foreign language should be explicitly warned that mnemonic devices are only meant to complement rather than replace other approaches to vocabulary learning [32].

To develop a strong vocabulary, students must link new information to previously learned concepts or information stored within their memory. Mnemonics can make vocabulary instruction an interesting and rewarding part of a student's learning experience [33]. Many different strategies are utilized in Mnemonic instruction that are designed to enhance students' memory of new information. The keywords, peg words, and letter strategies work with various combinations and thought processes, but all of them can be utilized to manage facts and information. These distinctive methodologies can be found under different names, such as imagination, association, and location, however they all have a noteworthy impact in recalling and retrieving new information [34].

Games are a rule-based system which has a different and measureable outcome, various outcomes have different values, the player tries his best to influence the outcome, and the final results are not compulsory [35]. Games can facilitate concentration on learning due to the fact that it can motivate learners and abate their anxiety and jittery. Digital game is a kind of teaching technology, as digital games present challenge and fantasy and could induce pupils' curiosity; besides, the feedback in the playing process could enhance pupils' learning knowledge [36].

Nowadays, there is an upward trend and ever-growing popularity in using computer-based video games in education [37]. In the same vein, educational games are activities that provide students with the opportunity to reinforce the previous knowledge by repeating it in a more comfortable environment [38]. Employing digital games in educational settings could provide important beneficial results for teachers in teaching to learners. Because learners get the chance to experience and make mistakes in a safe environment; the environments that parents want for their children. This kind of using games for learning is called gamification [39]; therefore, Perrotta *et al*. [40] declared that gamification deals with "how certain situations or processes (including learning) can be turned into playful experiences" (p.7). Therefore, this study aimed to find out if there were any significant differences between the effects of mnemonic techniques and digital game-based tasks on Iranian EFL students' vocabulary learning through distance education.

Materials and Methods

This research followed a non-randomized pretest posttest control group design, which fall under the category of quasi-experimental method due to the lack of true randomization, which is a common sampling problem in educational settings. In this study, based on a convenience sampling method, 75 Persian speakers were chosen from among a pool of 165 students, studying in private English language learning institutes in Qom, Iran. The participants of this study consisted of female teenagers who were 13 to 17 years old. Since they were all pre-intermediate learners, according to an oral placement test taken by institute, they were randomly assigned to three groups, a control group and two experimental groups, each consisting of 25 participants. Persian language was their first language of all of the participants.

The major instruments and materials, which were used in the present study, were as follows:

1) Oxford placement test (OPT), which is a standardized English proficiency test published by Oxford University Press, was initially used. It consists of 60 items on English grammar, vocabulary, and reading comprehension, and can place language learners in the right level of proficiency. Based on the scoring rubric of the OPT, learners who receive a score between 30 and 39 on this test could be labeled intermediate. The reliability of this test was examined using Cronbach's alpha method.

2) A Vocabulary Knowledge Scale (VKS), developed by Wesche and Paribakht (1996), was used as the pretest and the posttest, to check whether the participants know the targeted vocabulary or not. This test was used to check the novelty of instructed words pertaining to the topics of the sections from the digital simulation game (Vocabulary Builder) and to extract the participants' prior knowledge about those words. In fact, to make sure that the learners did not know the target words, a vocabulary knowledge scale was administered to them. In fact, the test was aimed at finding and eliminating the target vocabulary that were supposed to be taught to the learners and tested from them. This test was an essential test because the researcher wanted to make sure that the words that were supposed to be taught in the class through the two techniques were completely unknown to the learners, and they did not have any prior knowledge about the words. The VKT is an excellent way to measure ongoing progress learning individual words. It works especially well with word Cards, word lists, and paper dictionaries. A vocabulary knowledge scale measures how well the participants knew and can use words on a rating scale (1-5). This scale was used for the 20 words that were supposed to be taught in the class by the two techniques. Therefore, this test or scale had 20 questions for each of which the participants had to choose one of the above 5 scales of knowledge presented below each item. The same VKS was administered to the participants in all groups as the posttest at the end. The only difference between the pretest and posttest is the order of the items to diminish the practice effect.

3) The pre-intermediate coursebook of Big English Series [41] was the main coursebook used in this study. This book is chosen since there is a good match between the content of this book and the game Vocabulary Builder. In all three classes the vocabulary is almost the same and the learners used the same book (Big English 2) during the period of treatment.

4) Vocabulary Builder digital game, which had different sections where students could play with words, and the teacher taught some instructed vocabulary via the steps displayed in the game.

First, to comply with the research ethics, we explained participants' rights in this study. Also, we asked them to fill in a letter of consent that have to be signed by them and by their parents. The participants of the study were 75 pre-intermediate EFL learners and were chosen from among female learners. At the beginning, the researcher talked about the internet and its use in learning English and how can learners benefit from the internet applications. After that, she talked about the importance of integrating internet applications in educational environment as a whole and in teaching and learning English in particular. The teaching period was administered through internet

applications for all three groups. The OPT was administered to identify the participants' level of English language proficiency. After homogenizing the participants, they were randomly divided into three equal groups of 25 (two experimental groups and one control group). The course lasted a month, two sessions a week.

During a 30-day teaching period, which consisted of two 45-minute sessions during the week, students in the experimental groups were taught English vocabulary using mnemonic and digital game while students in the control group were taught lessons using the traditional methods. A list of words pertaining to the topics of the sections in digital game was instructed by the researcher. In the first week of treatment, a pre-test was given to the members of all control and experimental groups (mnemonic group and digital game base task group) in order to make sure that the words are unfamiliar to the participants. The pre-test consisted of twenty vocabulary items. At the first session, in mnemonic group, keywords approach was introduced to the students and they learned those words by using the strategies. At the end of the session, the participants were asked to have some practices on how to use mnemonic strategies out of the class time on their own.

In the digital game base task group, the participants experienced vocabulary learning (the same words) via a digital game called Vocabulary Builder. The participants came across those words while playing different sections of Vocabulary Builder. In each session, the teacher initially taught some instructed vocabulary. Then 25 minutes was devoted to playing the game and teaching the words via steps displayed in the game, whereas the participants in the control group did not have any strategies and the same vocabularies were instructed to the control group by conventional vocabulary instruction. At the end of the teaching period, the participants' performances were compared. After 7 sessions, a posttest was given to all control and experimental groups in order to check how many words they learnt throughout these sessions.

Finally, the data were analyzed both descriptively and inferentially. Data analysis was done by IBM SPSS (v. 22) software. In order to achieve the objectives of this study, one-way ANOVA and a Post-hoc Schaffer Test were used. The reliability of the OPT and VKT were examined using Cronbach's alpha.

Results

The purpose of this study was to investigate the impacts of mnemonic technique and digital game-based task on teaching vocabulary to Iranian EFL students through distance education. To this end, the following null hypothesis was formulated: There is not any statistically significant difference between the effects of mnemonic techniques and digital game-based task on teaching vocabulary to Iranian EFL students through distance education.

Initially, the VKT and OPT were piloted with 30 students, who shared the same educational background with the main sample of the study (Table 1).

Table 41. Internal consistency reliability of the instruments

Test	Cronbach's Alpha	N of Items
VKT	.78	30
OPT	.75	30

The Cronbach's alpha values show that the reliability of the OPT is 0.75, and that of the VKT is 0.78, both of which are acceptable levels of internal consistency. Therefore, that the researcher was assured that the tests were reliable to be used in the study.

In order to be able to conduct the one-way ANOVA procedure, we needed to check the assumptions of this statistical test. These assumptions are normality of distribution, homogeneity of variances, and absence of outliers. These tests were conducted before we could do the one-way ANOVA. First of all, the normality of distribution is checked and the results are as follows:

Table 2. Normal distribution of pretest and posttest scores

	group	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
pretest	mnemonic	.09	25	.20[*]	.96	25	.41
	game	.10	25	.20[*]	.95	25	.26
	control	.11	25	.20[*]	.97	25	.69
posttest	mnemonic	.11	25	.20[*]	.94	25	.17
	game	.10	25	.20[*]	.95	25	.27
	control	.18	25	.20[*]	.91	25	.31

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

Table 2 shows that the data are normally distributed across the two conditions (i.e., the pretest and posttest). After checking the normality of distribution, the homogeneity of variances was checked, and the results are as follows:

Table 3. Test of homogeneity of variances of pretest

	Levene Statistic	df1	df2	Sig.
Based on Mean	.40	2	72	.67
Based on Median	.33	2	72	.71
Based on Median and with adjusted df				
Based on trimmed mean	.33	2	71.06	.71
	.39	2	72	.67

The test of homogeneity of variances for the pretest was conducted through Levene's Test, and the results showed a significant value. This means that the variances are homogeneous in the pretest. In addition, this test was conducted for the posttest, which is as follows:

Table 3. Test of homogeneity of variances of posttest

	Levene Statistic	df1	df2	Sig.
Based on Mean	.31	2	72	.73
Based on Median	.29	2	72	.74
Based on Median and with adjusted df				
Based on trimmed mean	.29	2	68.08	.74
	.32	2	72	.72

The test of homogeneity of variances for the posttest was conducted through Levene's test, and the results showed a significant value. This means that the variances are homogeneous in the posttest. Therefore, both the pretest and the posttest had homogeneity of variances assumption met. Therefore, this assumption is approved for the one-way ANOVA test. In addition, the assumption of no significant outliers was checked. This assumption was tested through a box plot and the results are as follows:
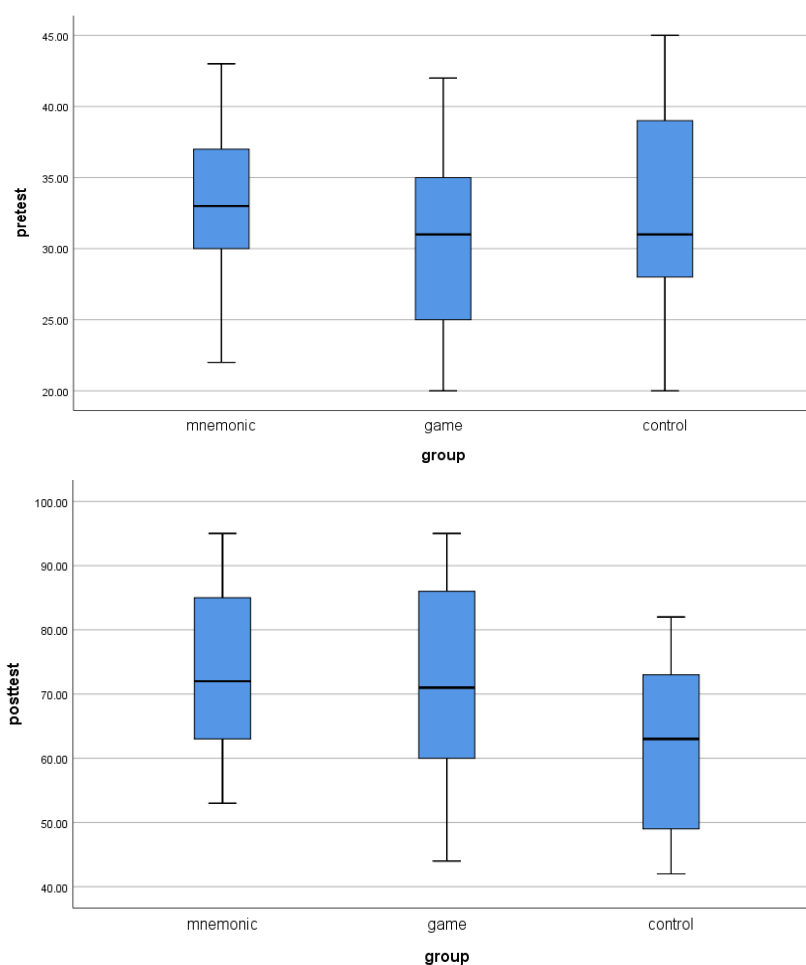
Fig 1. box plot of pretest and posttest scores

The figure above shows that in the pretest and posttest, there was no outliers in the scores. Therefore, the assumption of no significant outliers in the pretest and posttest is met. With all the assumptions met, the one-way ANOVA procedure can be safely conducted.

In order to make sure that before the treatment, the participants had more or less equal knowledge of the vocabulary that were going to be taught to them, the pretest scores were run for one-way ANOVA. The results of the pretest are as follows:

Table 4. One-way ANOVA for the pretest data

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	60.08	2.00	30.04	.67	.51
Within Groups	3213.60	72.00	44.63		
Total	3273.68	74.00			

The results of the One-way ANOVA test for pretest shown in the table above indicates that the difference in the means of the three groups is not significant. Therefore, it can be concluded that the groups did not significantly differ in the knowledge of vocabulary before the treatment. Hence, it can be said that they were homogeneous in terms of vocabulary knowledge before the treatment. Therefore, any possible significant difference after the treatment may mean that the difference is because of the treatment. The following section investigates the posttest of the three groups to see if any significant difference is found after the treatment.

Table 5. Descriptive statistics of the posttest scores

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Min	Max
mnemonic	25	72.32	13.31	2.66	66.83	77.81	53.00	95.00
game	25	71.96	15.21	3.04	65.68	78.24	44.00	95.00
control	25	61.56	13.28	2.66	56.08	67.04	42.00	82.00
Total	75	68.61	14.66	1.69	65.24	71.99	42.00	95.00

Based on the table above, it can be seen that the mean score of the mnemonic group is 72.32 (*SD*=13.31). In addition, the mean score of the game-based group in the posttest is 71.96 (*SD*=15.21), while that of the control group was 61.56 (*SD*=13.28). In order to see if this difference in the mean group of the three groups is statistically significant, the following table shows the results.

Table 6. One-way ANOVA fir the posttest data

|	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1867.22	2	933.61	4.79	.01
Within Groups	14032.56	72	194.89		
Total	15899.78	74			

Table above indicates that there is a statistically significant different between the three groups in their mean score of vocabulary posttest. Therefore, it can be concluded that the three groups are significantly different from each other after the treatment. To see where this difference in the mean score lies, the pairwise comparison was conducted through the post-hoc Scheffe test below (Table 7).

Table 7. Post-hoc Scheffe test of posttest scores

(I) group	(J) group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
mnemonic	game	.36	3.95	1.00	-9.51	10.23
	control	10.76[*]	3.95	.03	.89	20.63
game	control	10.40[*]	3.95	.04	.53	20.27

*. The mean difference is significant at the 0.05 level.

Table compares groups two by two. By looking at the table above, it can be concluded that the mnemonic group and game-based task group did not have any significant difference from each other (*p*=1). In addition, it was found that the mnemonic group and the control group had a significant difference with each other, which means that the mnemonic group has outperformed the control group. This means that the mnemonic technique is an effective technique compared to conventional teaching methods. The other finding of the results is that the game-based task group had a significant difference in means score of the posttest with the control group. Based on this finding, it can be concluded that the game-based task technique is an effective technique in vocabulary learning compared to conventional methods. The following figure shows the graphical representation of the performance of the three groups in comparison with each other
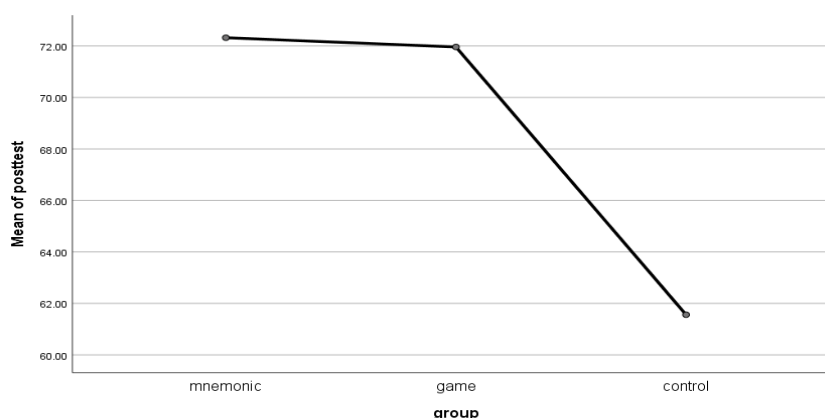
Fig 2. means plot of the groups in posttest

As a result, it can be concluded that the first null hypothesis, which was "mnemonic technique does not have any significant effect on teaching vocabulary to Iranian EFL students through distance education" was rejected. This means that mnemonic technique has a significant effect on teaching vocabulary to Iranian EFL students through distance education. In addition, the second null hypothesis, which was "digital game-based task technique does not have any significant effect on teaching vocabulary to Iranian EFL students through distance education" was rejected as well. This means that digital game-based task technique has a significant effect on teaching vocabulary to Iranian EFL students through distance education.

However, regarding the third null hypothesis, which was "there is not any statistically significant difference between the effects of mnemonic techniques and digital game-based task on teaching vocabulary to Iranian EFL students through distance education" was maintained. This means that there is not any statistically significant difference between the effects of mnemonic techniques and digital game-based task on teaching vocabulary to Iranian EFL students through distance education. In general, the mnemonic techniques and digital game-based task had similar effects on vocabulary learning of the participants of this study.

Discussion

The findings of this study can be discussed in terms of the studies that have found similar or different results to those of this research. In a similar study, Terrill and Scruggs [45] conducted a study in which one high school teacher used mnemonics to help her students with learning disabilities learn SAT vocabulary. The researchers found that students instructed using mnemonics memorized 92% of vocabulary words in comparison to 49% of the words memorized by students using the traditional method.

In another similar study, Azmi, Najmi, and Rouyan [46] examined the effectiveness of using mnemonic techniques in learning English vocabularies. The result of their study demonstrated the effectiveness of using mnemonic techniques in learning English vocabularies as well as the students' response towards the technique. According to their study, mnemonic methods specifically promote vocabulary retention of the elementary level of EFL. Similarly, Anjomafrouzi and Tajalli [47] conducted a study on using mnemonic associations on vocabulary recall of Iranian EFL learners. The results of their study indicated that a better performance of adult students is created with the use of mnemonic associations compared to control group. The higher performance of mnemonic groups who regularly reported using initial relations shows that initial associations have a significant part at vocabulary recall of students.

In another study that found similar results, Ashoori and Moghadam [48], attempted to find out the effectiveness of mnemonic devices as a memory strategy on the learners' vocabulary retention. The result of their study demonstrated that learners' delayed recognition of second

language vocabulary is not influenced by the passage of time, it implies that words learned via mnemonics instruction were retrieved well both in the process of immediate and delayed retention. In another similar study by Marzban and Azimi Amoli [49], the effect of mnemonic strategies instruction on the immediate and delayed information retrieval of vocabulary learning in EFL elementary learners was evaluated. The results of their study confirmed the superiority of the experimental group to the control group. They concluded that mnemonic strategies such as visualization and pictures affect the information retrieval in an immediate and delayed time interval on vocabulary learning in EFL elementary learners.

Similarly, Tavakoli and Gerami [50] investigated how the two different mnemonic non-verbal approaches (the keyword method and Pictorial method) to teaching lexical items affect learning and retention of vocabulary items. Their results revealed the effect of the keyword method on the participants' vocabulary learning. Analysis of immediate posttest and delayed posttest also confirmed the hypothesis that the participants who used the keyword method could store and retain vocabulary items in their long-term memory better than those who used the pictorial method. Correspondingly, Ahmadi Safa and Hamzavi [51] inquired into the effect of using mnemonic key word method of vocabulary instruction on the learning and retention of vocabulary over long term in a normal EFL classroom context. The results indicated that subjects in the key word group outperformed the memorization group at a significant level in both their learning and retention of the newly learnt vocabularies.

On the effect of games on vocabulary learning, Yip and Kwan [52] conducted an experimental study on using online vocabulary as a tool for teaching and learning English vocabulary with 3 teachers and 100 engineering students. The results of their study indicated that the experimental group outperformed the control group. Furthermore, the findings obtained from the qualitative data collection instruments revealed that the participants in the experimental group preferred online courses to face-to-face lessons. In addition, Chuang and Chen [53] studied the effect of digital games on children's cognitive achievement. Their study investigated whether digital games facilitates children's cognitive achievement in comparison to traditional computer-assisted instruction. The results indicated that digital game playing not only improved the subjects' fact or recall processes, but also promoted their problem-solving skills by recognizing multiple solutions for problems.

Similarly, Alemi [54] investigated the role of using word games in expanding the learner's vocabulary. In so doing, she used five-word games. She found the positive effect of word games on expanding learners' vocabulary. In another similar study, [17] investigated the effects of using a digital computer game on improving Iranian children's vocabulary learning. The result of their research indicated that the mean score of the children in the experimental group was higher than that of the control group. Likewise, Dolati and Mikaili [55] examined the effects of instructional games on facilitating of students' vocabulary learning. By analyzing the pre-test and post-test they found that applying games has the important role in teaching vocabularies to the language learners. They also found that game has its potential as an educational tool for literary training; and can motivate and engage learners especially the quiet and passive ones in the whole learning process.

In addition to the above-mentioned studies, Vahdat and Rasti-Behbahani [56] investigated the effect of video games on Iranian EFL students' vocabulary learning. The findings of their study revealed that learning vocabulary via video games was advantageous, and it was shown that males were more disposed toward video-game learning than females. They argued that there is a positive correlation between gender and learning vocabulary through video games. Likewise, Aslanabadi and Rasouli [57] conducted a study on the effect of games on improvement of Iranian EFL vocabulary knowledge in kindergartens. The result of their study revealed that games not only bring fun for learners to the class, but they also motivate learners and improve their confidence. In a similar vein, Efendi [58] conducted a study on the use of games to improve vocabulary

mastery. The findings of the study showed that "the use of "Got It Game" and "Back to the Board Game" with the topics vocabulary of daily English communication, people's occupation, and personal care and appearance can improve students' vocabulary mastery achievement." (p.78). In another similar study, Ashraf and Motlagh [59] investigated the usefulness of online games in vocabulary learning of Iranian EFL students. Results of their study revealed that mnemonic method and digital vocabulary games have facilitating effect on the process of teaching and learning vocabulary.

Conclusion

Based on the results of this study, it was found that mnemonic technique has a significant effect on teaching vocabulary to Iranian EFL students through distance education. This means that mnemonic technique has a significant effect on teaching vocabulary to Iranian EFL students through distance education. In addition, it was concluded that digital game-based task technique has a significant effect on teaching vocabulary to Iranian EFL students through distance education. This means that digital game-based task technique has a significant effect on teaching vocabulary to Iranian EFL students through distance education.

However, it was concluded that there is not any statistically significant difference between the effects of mnemonic techniques and digital game-based task on teaching vocabulary to Iranian EFL students through distance education. This means that there is not any statistically significant difference between the effects of mnemonic techniques and digital game-based task on teaching vocabulary to Iranian EFL students through distance education. In general, the mnemonic techniques and digital game-based task had similar effects on vocabulary learning of the participants of this study.

Studies that investigate the effects of mnemonic techniques and digital game-based task on teaching vocabulary to Iranian EFL students through distance education can be very useful for the field of study. In fact, finding out the effects of mnemonic techniques and digital game-based task on teaching vocabulary to Iranian EFL students through distance education can have several pedagogical implications which are presented in the following sections. In other words, the results of the present study are hope to have pedagogical implications for both EFL learners, teachers and curriculum designers.

One of the most important pedagogical implications that this study can have is for EFL learners, especially those who are studying in the context of Iran. Learners can enhance their retention of new words if they employ various mnemonic strategies, such as visual and verbal methods. Therefore, learners who wonder which technique is better form them to learn vocabulary better can find the results of this study helpful. In addition, learners who self-study can take advantage of the pedagogical implications of this study to study more effectively on their own.

Studies that investigate effects of mnemonic techniques and digital game-based task on teaching vocabulary to Iranian EFL students through distance education would provide teachers with new perspectives on how to teach vocabulary and help teacher to be more effective and helpful in the classroom. It may be a valuable approach for L2 teachers to realize which teaching instruction is more practical in Iranian schools, which might consequently may improve students' awareness and helps them to acquire language in more convenient way and therefore improve their language performance. Furthermore, the other implications that this study may have are that when teachers know about different mnemonic strategies, their differences, and their effectiveness, they could be more efficient in helping their learners how to make use of these strategies based on various factors including proficiency level, gender, learning context, etc.

The findings of this study can also have some implications curriculum designers. They need to be made aware of the proper way of including the right type of tasks to be utilized in the materials intended to improve vocabulary learning. Therefore, curriculum designers are advised to include mnemonic and game-based task approaches in their curriculums so that teachers can

use them in their classes. This way, curriculum designing can be more effective on improving the vocabulary knowledge of EFL learners.

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