



## **The Impact of Mnemosyne Computer Software on Iranian EFL Learners' Vocabulary Learning**

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### **Abstract**

The Mnemosyne computer software is a flash-card aid which optimizes learners' learning process. The current study was conducted to evaluate the extent to which Mnemosyne can assist college-level Iranian EFL learners to improve their vocabulary learning by utilizing spaced repetition. For this purpose, 60 intermediate-level EFL learners were chosen based on their performance on a proficiency test. Then, they were divided into two equal-sized experimental and control groups, each consisting of 30 participants. The participants of the experimental group were asked to use Mnemosyne on their own computers, their cell phones or other devices. They had opportunity to use numerous numbers of free flashcards on various subjects and users could build their own on different topics. The control group received instructions through conventional teaching methodology. The posttest was given to the participants of both groups in order to check the students' vocabulary learning. The results of independent sample t-test between the posttest scores of the two groups showed a significant difference between the scores of the experimental group and those of the control group. The results demonstrated that Mnemosyne significantly improved students' performance in vocabulary learning.

**Keywords:** Computer-Assisted Language Learning (CALL), EFL Learner, Flash-Card, Mnemosyne Software, Vocabulary Learning

### **ARTICLE INFO**

#### Article history:

Received: Monday, May 21, 2018

Accepted: Saturday, October 20, 2018

Published: Sunday, December 2, 2018

Available Online: Monday, November 26, 2018

DOI: 10.22049/jalda.2018.26246.1068

Online ISSN: 2383-2460; Print ISSN: 2383-591x; 2018 © Azarbaijan Shahid Madani University Press

## **Introduction**

The development of electronics created new chapter in the history of human life-history. Electronic devices at the beginning of the 20th century started to expand fast and now in the 21st century it is well developed. Electronic technology was extended in different parts of science and in every aspect of life like biology, medicine, engineering, transportation, education, and many other aspects to facilitate their lives and provide them with services. Because of these modern technologies, face-to-face contacts became less frequent and telecommunication increased. As a result of technology, daily life quality and the type of communications have been altered in a way that people in distant places are able to communicate with each other as if they are neighbors.

Today we live in the digital era and today's students are no exception. In one way or another, we all end up using technological devices on a daily basis for social and leisure activities and purposes. This alarming increase in daily use has given rise to changes in the way our children think, learn, and receive information.

The integration of technology in education has caused extreme changes in the outcomes of educational systems. According to Nan and Li (1998, as cited in Hu, 2007), "the Educational technology is the collection of technologies and methods in educational and/or teaching and learning activities in the human society. Here technology indicates physical technology while methods refer to intelligent technology" (p. 21). Brennan (2000, as cited in Hoon, 2008) believes, "the value of any technology for education is proportional to the need for that technology to realize educational objectives" (p. 36). The assimilation of computer technology in education is quite new. Followed by the wide use of computer technology in education and after the exhibition of internet, educational system of pencil and paper underwent reformation, e-learning was added to the face-to-face learning, and then information communication technologies (ICT) were expanded. Distance learning, web-based learning, and learning through video conference are examples of ICT. Accordingly, technology in education, similar to different scientific fields, has developed increasingly to attain educational aims.

Since twenty-five years ago, while computers have been entered into teaching processes, modern technologies brought new services into the educational centers (Oyaid, 2009). Rapid development in the areas of information and communication technology (ICT) in recent decades has affected different sciences including teaching language. The modern technologies in teaching and learning language consist of various subparts. Concerning the integration of computer assistance as modern technology with teaching process, Bax (2003) claimed we should reach to normalization position that is a point in which technology and teaching content combined in a way that technology unconsidered the issue. He also believed in future, "CALL will develop in a phase that teachers and learners apply ICT without trouble and fright as well as ICT will be revealed in most aspects of pedagogical goals" (p. 38).

In Iran, Vardanjani (2013) reported students mostly accept teacher-centered method and teachers demand grammatical explanation, lexical translation of the

texts, and applied teaching strategies in the classroom. According to Musavi (2001, as cited in Vardanjani, 2013) “teaching English in Iranian high schools was more grammar based and teachers put more stress on teaching grammar rather than teaching reading comprehension and communicative skills” (p. 4). So as a consequence, teachers will not try to use communicative technologies. The results of interviews and non-participant observations regarding the current use of technology in Iranian EFL courses suggest that the EFL teachers did not make use of new technology in their classes and there are just some limited textbooks based on audio activities (Dashtestani, 2013). Using different grammar software or video games for teaching grammar are small examples of matched ICT tools paralleled with English teachers’ method. Therefore, Iranian English teachers even do not use matched ICT tools related to their teaching method.

One of the most important requirements for successful communication is vocabulary. Today, vocabulary is believed to be the central part of language learning and it has great importance for language learners. Without vocabulary items the intended meaning cannot be understood completely. The significance of second and foreign language vocabulary learning has been highlighted by different researchers in language learning field (Nation, 2003). It was believed that learners could learn vocabulary items naturally (Allen, 1983). Today various techniques for teaching items are recognized.

Best achievements in communication depend on vocabulary learning, which is the chief component of language learning. Vocabulary is mandatory for understanding all the information in listening and reading and fundamental for developing speaking and writing skills. According to Kang (2004), the main goal of using visual aids for teaching vocabulary items is better comprehension and retention of new words. Visual aids are effective because they help learners to get and exchange information simply and they can make unintelligible concept easier to understand. It is also noted by Lazar (1996) that using experimental aids make the difficult task of vocabulary learning easier for learners, they help learners to acquire a large amount of vocabulary items in a short period of time. By using experimental aids students can have more participation in learning task, they increase students’ motivation and interest, and they are effective for learners at all levels of learning.

In Iran, traditional classroom settings and courses have urged students to sit at their desks with their textbooks all open to the same page. The class usually reads the section together, periodically stopping to write important information in notebooks. Students are likely reluctant and not engaged in the whole process of reading. Due to international business and social relations, people in almost all countries have to learn at least one foreign language due to its daily increasing importance. In our country, Iran, this foreign language, as in many other countries, is English.

Nowadays there are several ways to learn English language: institute classes, multimedia CDs, books, and many other methods. Among these methods of learning English, an individual could use different English language learning softwares, which is the concern of the current study. With these many tools available to the public for learning foreign language, and with regard to cost and time consumption,

to meet the challenges of the new world, more and more people are inclined to using software as a means of foreign language learning. It has been shown that pictorial presentation of vocabulary has positive effects on short-term and long-term vocabulary retention (Ghader & Bahloli Niri, 2016).

Language learners are continually complaining about lack of time and practical sources for learning English as we are all living in this fast-paced world surrounded by IT technology. Therefore, The fast pace of technological growth and the industrial path of the world has caused the traditional teaching methods to fall into disfavor. Thus, language learners happily welcome any teaching methods that save them time and energy and at the same time make their goal of language learning attainable.

Even though some language learners could be found whose eagerness for technology has made them amazingly interested in learning a second language through the aid of technological devices, there are still some learners who strongly believe in the practicality and efficacy of books. From the former point of view, as the world is converting to a technological place and thereby nearly all tasks are done through technology, language learning and teaching should make an effort to seek some ways to deal with this issue technologically.

With regard to the variety of learning packages available for learners and also the reality of commercial approaches in developing such packages for English language learning and teaching, learners and students encounter many pieces of language learning software and tools about the quality of the educative efficacy of which little comparison with other tools has been made. In Iran, there are no comparison and evaluation tools (such as models, measurement methods, and instruction) to evaluate and standardize these pieces of software.

In this respect, the present study is going to shed light on discussed issues through the lens of English language teachers and learners. Particularly, this study makes an attempt to determine the effectiveness of teaching the skills and components of a second language through a given piece of software to see whether or not it may perform more successfully than books in serving the purpose of second language learning. In this regard, the significance of inserting technological tools in the field of language learning is of certain importance.

Warschauer and Liaw (2010) state that many adult students have had difficulties with traditional education and face substantial barriers to learning. Using technologies described above provide nontraditional means by which literacy and language skills can be developed through authentic communication, collaboration, networking, and scaffolding (Warschauer & Liaw, 2010). They maintain that these technologies give learners enormous opportunities to use English on a daily basis in meaningful contexts in and out of school.

Bagheri, Roohani, and Ansari (2012) conducted a study in which two methods of vocabulary teaching/learning, i.e. CALL-based and non-CALL based methods, were investigated and compared in terms of vocabulary learning in the short and long-term learning. They divided 61 young elementary Iranian EFL learners into two groups of CALL users and non-CALL users. Their study revealed no significant

difference between the vocabulary scores of the two groups in both long term and short term and long term vocabulary learning. In effect, it was found that both methods are more effective in short term learning.

The main purpose of the study is to investigate the extent to which a computer-based flashcard program, Mnemosyne, can help college-level EFL learners improve their vocabulary. It is worth mentioning that using software to learn language is categorized in the realm of computer-assisted language learning (CALL).

### **Research Question**

In this respect, the following research question is posed:

- Does Mnemosyne software have any significant effect on Iranian EFL learners' vocabulary learning?

### **Methodology**

#### **Participants**

The participants were 60 intermediate learners who were studying in various universities of Isfahan. Both male and female learners were enrolled in the study. Attempts were made to include an equal number of each gender, so that gender can be controlled. Oxford Placement Test (OPT) was used to select homogeneous intermediate learners. They were then randomly assigned into two groups, an experimental group and a control group. The participants' age range was between 18 and 28. The participants' native language was Persian. All participants were learning English as a foreign language. They had been learning English for more than four years and were upper-intermediate EFL learners. The participants of the study received vocabulary instruction along with other language components in their general English course.

#### **Instruments**

The instruments employed for data collection consisted of OPT, pretest and posttest, and Mnemosyne software. The detailed description of the instruments is as follows:

#### **Oxford Placement Test (OPT)**

The first instrument used in this study was the Oxford Placement Test (OPT). The validity of the test is self-evident. OPT has been used to evaluate the participants' language proficiency. It also enabled the researcher to have a greater understanding of what level (i.e., elementary, pre-intermediate, and intermediate) their participants were at. This test consists of 70 items, including 10 multiple-choice and true-false items for reading, 10 items for writing, and 50 multiple-choice language use items. The time limit for answering the 50 multiple-choice questions and the reading task is 45 minutes and the time limit for the accomplishing writing task is roughly 20 minutes.

## **Vocabulary Pretest and Posttest**

Based on what has been mentioned, selected 35 words of Preliminary English Test (PET) vocabulary list were used to design a multiple-choice (M/C) test with 35 items and 4 alternatives for each item. The reason for choosing this type of test format was its high objectivity, which promotes the external validity of the test. Furthermore, multiple-choice design is one of the most accustomed testing formats. The vocabulary test was piloted among 20 participants. Based on the item analysis of the collected data, defected items were revised. Moreover, in order to ensure pilot test's reliability, Cronbach alpha reliability was performed. Finally, the modified version of pilot test was used as both pretest and posttest.

The researcher selected 35 vocabulary items from among the words in PET vocabulary list. There are some reasons for selecting the words from such a word list, which are explained below:

- First, PET vocabulary list was developed by Cambridge ESOL which is the same as PET, which are more likely to follow the same line which in turn increases credibility of the study.
- Second, PET vocabulary list has been developed to guide the writers who produce materials for this type of test. Moreover, PET is another standard test developed by Cambridge ESOL and a well performance on it proves speakers' intermediate language proficiency, which is a level higher than Elementary; therefore, selected words are less likely to be known by participants of this study prior to the treatment.
- Third, based on the corpus evidence, PET vocabulary list involves high frequent words which are considered as important factor in teaching vocabulary. Nation (2003) believes that teachers should facilitate vocabulary learning by teaching practical words to learners.

## **The Mnemosyne Software**

The Mnemosyne software is a flash-card instrument, which simplifies learners' learning process. It is a research project into the nature of long-term memory. Mnemosyne intends to be a convenient flash card program, with a clean, smartly simple interface that does not require learners to be confused with complicated concepts before using it. Cards can consist of pictures, sounds, and movies.

Mnemosyne can produce two sister cards: a so-called 'recognition' card asking learners to come up with the translation of the foreign word, and a 'production' card asking learners to find the foreign word. Of course, the material on the cards can be edited and both cards will be automatically updated. Cards can be easily demonstrated accurately regarding their date of creation or difficulty and so on.

The main objective of the Mnemosyne is to help learners to establish their academic vocabulary learning by using spaced repetition. The research in both memory and second language learning area shows that spaced repetition is more effective than massed repetition and it ensures more stable learning (Nation, 2003).

Most of disremember will happen promptly after the first encounter with a new word. The next time, the target word can be remembered for a day or two. However, the time after that, the learner will presumably remember it for a longer time. Therefore, the primary role of Mnemosyne is to arrange review times for learners just before the learner is anticipated to forget the target word by using a spaced repetition learning system. It is an important opportunity for learners compared with other conventional flashcard systems in which learners choose the time to practice cards.

## Procedure

The participants' intended language proficiency level for this study was elementary. To verify the homogeneity of the participants, a standard English language proficiency test, i.e. OPT was conducted. Then, they took pretest in order to measure their knowledge of vocabulary before treatment sessions. Irrespective of learners' performance on pretest, they were randomly assigned to two equal groups of experimental and control.

The participants of the experimental group received vocabulary items through Mnemosyne software in such a way that they could see the texts with both static and animated pictures. The participants used it on their own computer, laptop or other devices such an iPod touch. The participants could also generate their own cards on different words. It is basically based on a paper flashcard system with the question on one side and the answer on the back. The target vocabulary items for the study has been obtained from Coxhead's (2000) *Academic Word List* which includes the most common words in university textbooks. An academic vocabulary dictionary, which includes 210 academic words, was designed for the study and learners used Mnemosyne ten minutes a day for three weeks.

Control group received vocabulary instruction via traditional method, which was widespread in similar courses by means of using dictionaries, definitions, synonyms, translation, etc. At the end of the treatment sessions, all participants took the same posttest that contained all vocabulary items they studied throughout the sessions in order to evaluate their vocabulary gain at the final session of their course. The posttest was the analogous version of the pretest.

## Results/Findings

The descriptive statistics of the participants of each group on pretest has been presented in Table 1.

**Table 1.** Descriptive statistics of three groups' performance on pretest

| Groups             | Statistic      |       |
|--------------------|----------------|-------|
| Experimental Group | Mean           | 13.14 |
|                    | Std. Deviation | 2.238 |
|                    | Minimum        | 6     |
|                    | Maximum        | 17    |
| Control Group      | Mean           | 13.63 |
|                    | Std. Deviation | 1.699 |
|                    | Minimum        | 7     |
|                    | Maximum        | 17    |

In order to ensure that there is no significant difference between the two groups regarding their pretest scores, an independent sample t-test was performed. The results are provided in Table 2.

**Table 2.** Independent samples t-test between experimental and control groups on pretest

|                |                         | Levene's Test for Equality of Variances |      | t-test for Equality of Means |    |      |                 |                       |   |         |
|----------------|-------------------------|---|------|------------------------------|----|------|-----------------|-----------------------|---|---------|
|                |                         | F                                       | Sig. | t                            | Df | Sig. | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference |         |
|                |                         |   |      |                              |    |      |                 |                       | Lower                                     | Upper   |
| <b>Pretest</b> | Equal variances assumed | .576                                    | .451 | .452                         | 58 | .653 | .36667          | .81043                | -1.255                                    | 1.98892 |

There was no significant difference between experimental and control groups ( $t = .45, p > 0.05$ ) in their performance on pretest. The descriptive statistics of the groups of participants' post-test vocabulary scores has been presented in Table 3.

**Table 3.** Descriptive statistics of three groups' performance on posttest

| Groups          |                      | Statistic      |       |
|-----------------|----------------------|----------------|-------|
| <b>Posttest</b> | <b>Experimental</b>  | Mean           | 28.00 |
|                 |                      | Std. Deviation | 1.645 |
|                 |                      | Minimum        | 19    |
|                 | <b>Control Group</b> | Maximum        | 33    |
|                 |                      | Mean           | 16.11 |
|                 |                      | Std. Deviation | 1.132 |
|                 | Minimum              | 10             |       |
|                 | Maximum              | 18             |       |

In order to detect the possibility of the effects of the experimental aids in enhancing elementary EFL learners' vocabulary learning, an independent sample t-test was performed between the performances of both groups on posttest. The results are provided in Table 4.

**Table 4.** Independent samples t-test between the posttest scores of control and experimental groups

|                 |                         | Levene's Test for Equality of Variances |      | t-test for Equality of Means |    |      |                 |                       |   |       |
|-----------------|-------------------------|---|------|------------------------------|----|------|-----------------|-----------------------|---|-------|
|                 |                         | F                                       | Sig. | t                            | Df | Sig. | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference |       |
|                 |                         |   |      |                              |    |      |                 |                       | Lower                                     | Upper |
| <b>Posttest</b> | Equal variances assumed | 1.348                                   | .250 | 6.500                        | 58 | .000 | 9.71            | .352                  | 1.584                                     | 2.987 |

The results of independent samples t-test revealed a statistically significant difference between the participants of control and experimental groups' scores ( $t = 6.50$ ,  $p < 0.05$ ) on posttest. It indicates that EFL learners of experimental group outperformed vocabulary posttest. Thus, the research question of the study was verified.

## **Discussion**

Based on the results of statistical analyses, it was found that Mnemosyne software was an effective tool to help EFL learners to learn foreign language vocabulary. The findings of the study provided an empirical support for the efficacy of flash-card instruction through computer software on Iranian EFL learners' vocabulary learning.

The results of this study supported the findings of Wright (1992) who found out visual instruction of vocabulary is motivating and draw learners' attention. Also, the findings of this study were in line with those of Wright and Haleem (1992) as they provided several significant ways to illustrate the meaning of a new word or a piece of language through pictures.

The results of this study could support those of Scott, Ytreberg, and Lisbeth (1993) who stated that visual activity is advantageous for checking object vocabulary, prepositions, colors, and numbers.

In line with the findings of this study regarding the inadequate use of visual aids in the teaching-learning process, Abebe and Davidson (2012) performed a research to examine the role of visual materials in teaching English vocabulary. The results of the study showed that most teachers believe that the use of visual materials would help learners to promote their vocabulary.

The findings of the present study oppose those of Gazimbe, Mapolisa, Khosa, and Tshabalala (2015) who carried out a study to see whether teachers in primary schools in Nkayi district effectively used visual aids when delivering lessons; it was found that teachers were not effectively using visual aids to deliver lessons.

The upcoming issues accompanied with the already existing controversial issues surrounding the matter may mandate more research in an area waiting to be further investigated. In this section, some suggestions are provided for further studies.

The posttest was taken immediately after finishing the treatment sessions. In other words, posttests examined learners' immediate retention of lexical items. It is recommended for further studies to evaluate the long-term retention of vocabulary by another posttest to be administered several days later.

## **Recommendations for Further Research**

The limitations of the study and our own reflections yield suggestions for future research. Based on the limitations of the study, it is recommended that the sizes of both samples of teachers be enlarged in order to allow the future researchers to offer

more insightful generalizations of the obtained findings. Future researchers are also recommended to conduct the study while observing more classroom sessions in each of the contexts in question in order to produce more generalizable results. Additionally, conducting the current study in different parts of Iran may contribute to this category.

## **Conclusion**

The results of this study revealed that teaching vocabulary elements while using Mnemosyne software would result in better learning among EFL learners. Mnemosyne software also increased the motivation of learners to promote their vocabulary knowledge as they experienced different ways to learn vocabulary items. They were involved in the process of learning by interactive exercises and activities, therefore it helps them improve their vocabulary learning. It was also found that by the use of a visual vocabulary instruction framework such as the one investigated in this study, EFL learners can face with more opportunities to communicate in EFL classes.

To summarize, this study might have clarified some issues attributable to some visual vocabulary learning activities in terms of CALL-based techniques along with their effects on EFL learners' language learning. However, it might also have given rise to more issues regarding the matter. EFL learners in their learning activities were provided conditions to take more benefits of classroom time by being involved in productive and interesting tasks. This fact confirmed the effectiveness of our given program.

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