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# The Effect of CALL on the Vocabulary Learning of Iranian EFL Learners

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## Abstract

The present study was intended to investigate the effectiveness of CALL on Iranian EFL learners' vocabulary learning in two institutes in Tehran, Iran, as compared to those students receiving traditional instruction using the printed text materials. CALL (Computer Assisted Language Learning) has given man versatility in many areas, and seems the paramount representation of technology for today. The goal of the study was to examine the effects of the application of CALL on students' attitudes towards CALL before and after the instruction. To carry out the study, 60 homogeneous male and female participants were selected from among students and randomly assigned into two groups, the traditional group and CALL group. A vocabulary achievement test as pre-test was administered to participants of both groups. The results of t-test confirmed that there is no significant difference between the participants regarding their vocabulary knowledge. The Computer Assisted Instruction group experienced 16 sessions of instruction using the CALL. The traditional instruction group received the same hours of instruction and materials but on paper with no audio-visual features. The result of paired sample t-test between pre-test and post-test of both groups of study revealed that there is a significant difference between experimental and control group regarding their vocabulary knowledge. CALL instruction improved EFL learners' knowledge of vocabulary. Besides, the results of descriptive statistics showed that the group who received Computer Assisted Language Learning was outperformed in this study.

**Keywords:** X Computer Assisted Instruction (CAI), Computer Assisted Language Learning (CALL), Multimedia, Traditional Instruction

## I. Introduction

Technology has surely influenced human activities and education is not an exception. Applying technology to the learning is becoming an important educational issue today. It has also influenced foreign language teaching and learning in many different ways. The application of practice with the most relevant technology in a particular context is challenging language teachers to achieve effective teaching with technology. Computers like other forms of technology are linked to people's lives, jobs, hopes and dreams.

During the past decade, use of computer in educational setting has increased dramatically from the combination of educational needs and technological means (Warschauer, 1998).

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Meanwhile, application of Computer Assisted Language Learning (CALL) is experiencing a renaissance in the modern language teaching and learning arena, with a high growth of popularity. It involves the use of technology in the form of computers ranging from software to the Internet (Hewer, 2007). Egbert (2005, p. 4) defines CALL as "learners learning language in any context with, through, and around computer technologies" (as cited in Figure & Jarvis, 2007). CALL is a field tied closely to other areas of study within applied linguistics such as autonomy in language learning, as well as to the teaching of particular language skills (Beatty, 2003). The technologies used in CALL instruction fall into two categories: software and (b) Internet-based activities (Hewer, 2007).

CALL is increasingly integrated into curricula to promote the development of all skills. One form of this integration is with the use of multimedia. Multimedia technologies benefit from texts, pictures, graphics, animations and sounds. In the field of language learning, multimedia has been investigated by many researchers. Results showed a positive effect of multimedia on learning languages (Al-Seghayer, 2001; Chun & Plass, 1996; Jones & Plass, 2002; Moreno & Valdez, 2005; Nikolova, 2002; Tsou, Wang, & Li, 2002).

CALL is a new issue in both computer and linguistics sciences. Linking both fields, it offers good promises to teachers, linguists, and computer researchers. With the growing sense of unity between linguists and computer scientists, some of the mysteries of language acquisition will be unraveled, which can furnish the new locus to language more effective and principled language teaching (Kenning, and Kenning, 1990). The linguist can provide the theoretical assumptions of language learning, the efficient approaches, and methods required by language learning and acquisition process, while the computer scientists can resort to the most sophisticated means, computer, to render those requirements. There are many peripheral applications for computers in the educational domain. Language testing, language research, and school management, for instance, all offer scopes for computer application.

Vocabulary knowledge as one of the component skills seems to play an important role in language achievement. Kitajima (2001) argues that without words that label objects, actions, and concepts, a speaker cannot express intended meanings. Words are the units of meaning. Sentences, paragraphs, and whole texts are formed from words. Language ability is often regarded as the number of words that we know. Therefore, vocabulary teaching/learning is a critical area that deserves paying special attention.

Elementary course books place some emphasis on basic vocabulary sets, such as furniture, transport and kinds of building, and more advanced course books, ESP courses are much concerned with specialist lexis for engineering, medicine and business; but for the rest, students are expected, on the whole, to pick up new vocabulary from their course books and integrate it somehow into their general language competence (Jones & Fortescue, 1987). The argument over the most effective vocabulary teaching strategy has been referred to as the "fertility versus futility debate" (cf. Baumann & Kameenui, 1991). Advocates of fertile vocabulary instruction cite several empirical studies suggesting the greater efficacy of direct instruction. Those on the futile side of the debate argue in favor of vocabulary development within a broader educational framework that provides opportunities for students to map word meanings onto existing schemas (e.g., Nagy, & Hermann, 1987).

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However, Wood (2001) advocates teaching practices that combine both direct instruction of unfamiliar words and incidental learning of vocabulary in natural contexts. Wood argues that neither explicit instruction of a specific subset of word meanings nor incidental learning of vocabulary through literacy practices, such as extensive reading, is a sufficient strategy for vocabulary learning when used exclusively. Instead, rich learning environments that promote deep understandings of words and their semantic relationships are best created by applying both approaches in concert.

For this reason, the author has paid special attention to CALL product that has successfully combined these two approaches. By and large, this seems to work reasonably well, if students are given some opportunity to manipulate and play with new items, to help assimilate them, and make them in their own. How this is best done, according to Jones and Fortescue (1987) depends on the individual student: some prefer to take word games, others to list words in vocabulary books and learn them by heart. (p. 21)

Research on computer-assisted vocabulary learning has significant implications for CALL software design. By surveying vocabulary acquisition theories, guiding principles for the design of CALL programs for vocabulary have been suggested or the researchers have described programs they developed for vocabulary teaching (Son, 2001). These research activities would provide better understanding of how software can be developed and used best in CALL environments and of what students learn for computer-assisted vocabulary activities. It is indispensable to understand how the computer application for the study should be created. Hegelheimer and Chapelle (2000) and Chapelle (1997, 1998) argue that research on CALL should be based on appropriate theoretical foundations.

In a study by Horst, Cobb, and Nicolae (2005), a set of on-line tools for vocabulary learning was created for an ongoing experimental project. Their on-line vocabulary learning tools, which contained several resources for learners such as concordance, dictionary, hypertext, and a database with interactive self-quizzing features, were designed to facilitate learners' deep processing. The participants were directed to insert vocabulary information (e.g. example sentences, parts of speech, and definitions) on a collaborative on-line word bank by themselves, and the gain of their vocabulary knowledge was examined in a posttest. The results showed that the words entered in the word bank were learned more (nearly double) than the words that were not entered. Based on the significant results, the researchers concluded that the vocabulary learning on-line set created for the project was able to offer rich input and encourage deeper processing. In the like manner, Jones (1999) also created a computer program called "Gertie" which was intended to promote effective vocabulary learning. This program integrated written texts, photographs, and sound. He found that the application was effective for the learners and was able to contextualize and personalize learners' learning processes on vocabulary. The findings of this study showed positive reactions from the learners and the possibility of computer use for vocabulary learning.

Meanwhile, CALL seems to be of great advantages over other common techniques, such as cassette recorder or TV programs, regarding vocabulary development. Jones and Fortescue (1987) believe that: "Since, its clarity and attractiveness of presentation, its games-manager role, its availability at all hours and its flexibility in supplying for the preferences of different users, are motivating force to enhance vocabulary acquisition" (p.24).

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## **II. Statement of the problem**

English language is an international language and is being used widely in businesses, academic, and other aspects of life. Research efforts have been going on to investigate ways to improve learning languages including learning English as a foreign language. In Iran, English language education is considered especially important for experts of the other fields. The problem is that students who have received several years of formal English instruction frequently face difficulties to use the language, whether in the spoken or written form. You may see someone who has studied 18 to 20 terms in an institute but he/she is unable to express himself/herself in English. The gravity of the situation comes to eyes when, if not many, some technical subjects are not satisfactorily learned until the students study relevant text books and materials in English.

Most students have problems when they are asked to learn the new words in a single lesson. Some of them who have found the job very difficult will quit the job at the very beginning, and some try to memorize a word list. None of us can forget the tough job of memorizing word lists during the school days. Learning vocabulary in isolation, in a non-meaningful way, without any pronunciation hints, as it is common among Iranian students, will definitely lead to short term memory storage, frequent mispronunciations and a total lack of knowledge of the usage. Students' unfamiliarity with phonetic alphabet, on the one hand, and the teachers' incorrect pronunciations in some cases, on the other hand, prevents students from getting help from their auditory memory when they need to remember the previously learned items.

## **III. Research questions**

The present study aimed at investigating the pedagogical effectiveness of CALL in developing vocabulary of Iranian EFL learners in comparison with the traditional instruction. In order to achieve this purpose, the following research question was proposed:

- Does CALL instruction have any effect on Iranian EFL learners' vocabulary learning?

## **IV. Research hypotheses**

To answer the above question, the following null hypothesis was formulated:

- CALL has no effect on vocabulary learning of Iranian EFL learners.

## **V. Method**

The study was conducted at two branches of Tehran Cambridge Institutes which are located in Tehran, Iran. The participants were female and male learners and their ages ranged from 19 to 33. They had already enrolled in the English Language institutes. They were selected with regard to their language proficiency level and length of time studying English in the institutes. A pre-validated test was administered to the subjects to obtain a homogenous sample. As a result, only 60 subjects had the required language qualification for a homogeneous sample to fulfil the purpose of this study. Also they were briefed about the mechanism of the research and were divided into two thirty-student groups, and were assigned as the experimental and control groups.

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The research utilized the following materials. It consisted of a proficiency test, vocabulary levels test, computer laboratory and, a questionnaire based on five-point Likert scale. The following sections include further details about these instruments:

- **Language Proficiency Test:** Nelson Proficiency Test consisting of 50 items was used in order to homogenize the participants in terms of their English language proficiency. This multiple-choice test comprised of cloze passages, vocabulary, structure, and pronunciation.
- **Vocabulary Levels Test:** The vocabulary test was designed for pretesting and post testing: The test was designed by the researcher through selecting different vocabulary items from standardized proficiency tests, such as Nelson English language test and TOEFL. It has been tried to select the vocabulary items that were covered during the treatment procedure. The vocabulary items included content words, such as nouns, verbs, phrasal verbs, adjectives, and so on, comprised of different types of passive and active items that were essential for speaking and oral communication. The test procedure consisted of 45 items, including 10 cloze items, and 35 multiple choices

In order to determine the reliability of the tests and ensure the compatibility of the test to the learners' level of vocabulary knowledge, this test was pilot studied on the learners (n = 20) who were similar to the learners of the main study in terms of age, sex and proficiency level. The results of the Cronbach's alpha analysis showed that the test was reliable ( $r = 0.82$ ). The results of item analysis (facility index) showed that two items were easy and one item was difficult. These items were revised and the final version of test was used in study. The content validity of the test was checked by an evaluation done by three experienced experts in the field of applied linguistics. They were PhD holders of applied linguistics with more than five years of experience.

- **Computer hardware:** The required computer hardware included PCs, with graphic and sound cards, speakers, microphones, and mice.
- **Computer software:** Windows 7, Packages of "Tell Me More" CD-ROM were used as the main software media of instruction.
- **Questionnaire:** A questionnaire consisting of a five-point Likert scale was used to determine CALL users' overall attitudes towards CALL before and after the treatment. This questionnaire was adopted from Knezek and Christensen (1997), Knezek & Miyashita (1994), Loyd and Gressard (1984); Pelgrum and Plomp (1989), Griswold (1983), Francis (1993), Kay (1993), Jones and Clark (1994), Albirini (2006). Prior to its distribution among the main research samples, the questionnaire was piloted on 125 learners who were similar to the participants of this study. The reliability of the questionnaire was calculated using alpha Cronbach. The results showed a high value of reliability ( $r = .90$ ). Finally, the modified version of the questionnaire, which contained 26 items, was used in this study. Five points of Likert scale were from strongly disagree, disagree, neutral, agree, to strongly agree. Some

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negative questions were reverse coded to minimize the possibility of students giving the answers they believed were expected of them. The completion time of the questionnaire was ten minutes. The content validity of the instrument was checked by evaluation done by three experienced experts in the field of applied linguistics. They were PhD holders of applied linguistics with more than five years of experience.

To achieve the purpose of the study, the subsequent steps were pursued during the research progression in order to collect the data.

All participants of the study ( $n = 76$ ) were given a language proficiency test in order to ensure their homogeneity in terms of language proficiency level. The learners whose scores fell one standard deviation above and below the mean were selected to participate in the main study. The random selection procedure initiated with assigning 60 Iranian EFL learners randomly into two groups of 30, namely experimental and control. The random selection procedure began after administering an English language proficiency test.

Pretest consisted of a 50-item pre-validated vocabulary test. It was administered on control and experimental groups to ensure that they were homogeneous with respect to the variable of this investigation, that is, the vocabulary knowledge. Since, the test items had been designed by the researcher, it needed to satisfy the criteria of a standard test, such as validity and reliability; that is, the test needed to be validated and then was administered to the experimental and control groups as the pretest. Subsequently, the obtained results were collected and analyzed as a source of data both to confirm that the experimental and control groups had the qualification of a homogenous sample with regard to their vocabulary knowledge, and, also to measure the possible initial differences existing between the groups.

The experimental group received the treatment condition for their instruction. The treatment condition comprised of teaching vocabulary with computer. In order to clarify the procedure of this study, it would be helpful to have a brief overview of the content and organization of the employed computer program in this study, and then go through the treatment overview.

The interactive multimedia CD-ROM employed in this study was Tell Me More, version 10. Tell Me More includes animations, audio, images, maps, music, photographs, videos, and text incorporated into the software containing 30 situation-based chapters; each with lessons, exercises, and games to reinforce comprehension, vocabulary, grammar, writing, and speaking skills. Each chapter consisted of different screens or sections including goals section, vocabulary section, story section, action section, exercise section, grammar section, conversation section, and games section. The program encompassed 102 chapters, and a connection to The Company's online Adviser websites.

In this study, it was determined to teach the first nine chapters or lessons of the CD, and the first three movies. The titles for each chapter were living in America, the company, at the airport, an emergency, giving your opinion, seminar planning, business call, insurance and banking and customer service.

The control received teaching the vocabulary, in the conventional way, through the printed text. The same activities were conducted in giving the instruction to the control group, except, the materials which was not the Tell Me More CD but the Tell Me More book. There,

was no computer or any authentic program to be used in this group. Moreover, in occurrence of any error or mistake the researcher was the mere source of correction for the control group, whereas, the experimental group received both researcher and computer feedback. For instance, in doing the exercises the experimental group answered the exercises through their keyboards. The students did not receive the right answer directly, but through problem solving activities, and trying more to find out the right answer.

## VI. Data analysis

Pretest was conducted in order to assure that there was no significant difference between the participants of the study with regard to their vocabulary knowledge. All Participants of study were required to answer 45 multiple-choice items. Table 1 represents a summary of descriptive statistics from pretest for both experimental and control groups. As the obtained data represents the two groups gained an almost common statistical characteristic to be called a homogeneous sample.

Table 1. Descriptive statistics of participants' scores on pre-test										
		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	
Pretest	Equal variances assumed	.316	.576	.936	58	.353	.933	.997	-1.063	2.930

In order to ensure that there is no significant difference between the control and experimental groups regarding their knowledge of vocabulary, an independent sample t-test was performed. The results, as Table 2 shows, indicated that there is no statistical significant difference between experimental and control group ( $t = 0.93$ ,  $p > 0.01$ ) in their performance on pre-test.

Table 2. Independent Samples t-test between the control and experimental group on pre-test						
Pre-test	class	N	Minimum	Maximum	Mean	Std. Deviation
	Experimental	30	14	30	19.76	4.07
	Control	30	13	26	20.70	3.64

The participants of control and experimental groups took a similar version of pre-test after administration of the research. The results of their performance were illustrated by descriptive statistics of Table 3.

Post-test	class	N	Minimum	Maximum	Mean	Std. Deviation
	Experimental	30	26	39	33.40	3.02
	Control	30	24	40	29.43	2.81

In order to investigate the null hypothesis of the study, a paired sample t-test between the scores of experimental group on pre-test and post-test was performed. The results are shown in Table 4.

Paired Differences									
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig.
					Lower	Upper			
<b>Pair 1</b>	<b>Groups - Scores on Pre and post test</b>	2.325	5.854	.534	-24.383	22.266	43.646	119	.000

The results indicated that there was a significant difference between the participants of experimental group on their performance in pre-test and post-test ( $t = 43.64$ ,  $p < 0.01$ ). Therefore, the null hypothesis of study was rejected. CALL instruction was significantly improved Iranian EFL learners' vocabulary instruction.

## VII. Discussion

This study supported the fact that associating lexical items with different types of media fosters richness of recall cues and increases the likelihood of retention of Iranian EFL learners. In this respect, Chun and Plass (1996) emphasized, the rationale for this fact is that because words are coded dually in two modes, they are learned better than those coded only in one mode. Dual coding provides more paths for retrieval, and as such, helps learners build two types of recall cues in memory.

Based on the findings of this study, Lyman-Hager's statements which says computerized presentation is more appealing was confirmed. Unlike traditional presentation of vocabularies in the printed form, the computerized presentation was more appealing for the participants of this study. As pointed out by Davis and Lyman-Hager (1997), the computer's capacity permits the user to store more extensive glossing than a printed format does; further, it does not interrupt the user because the unknown words are visible simply by a mere click at a

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finger tip. In other words, the user is provided with the desired meaning immediately without disturbing the reading process, a problem usually caused by stopping to look up words in a dictionary.

This study holds up the fact that one of the salient features confirmed by many researchers, such as Martinez-Lage (1997), Al-Seghayer (2001), Wood (2001), which showed the potentiality of computer, was the multimodal presentations of any kind of instructions. Since the multimedia presentations provide immediate access to the available annotated information in a program, including textual, audio, and visual annotations, these pieces of information attached to a word enables readers to "confirm or reject hypotheses made about the meaning of a word" as Martinez-Lage (1997) contends. In this respect, Mayer and Sims (1994) state that one of the functions of a multimedia program is to help learners construct referential connections between two forms of mental representation systems: the verbal and the visual one. These referential connections are more easily built when both verbal and visual materials are presented simultaneously.

Based on the results of statistical calculations pursued during this process, the null hypothesis study was rejected and it was concluded that there is a significant difference between the experimental and control groups' performances due to the given treatment to the experimental group.

Further, the study has yielded the conclusion that diverse CALL programs such as video clips are more effective in teaching vocabulary items than a still picture in the textbooks for Iranian EFL learners. As Al-Seghayer (2001) states among the suggested factors that explain such a result are that video better builds a mental image, better creates curiosity leading to increased concentration, and embodies an advantageous combination of modalities (vivid or dynamic image, sound, and printed text).

Moreover, participants of this study learned and recalled more words when CALL programs were provided. The variety of modality cues can reinforce each other and are linked together in meaningful ways to provide an in-depth experience. In this regard, Chun and Plass (1996) state the rationale behind this is that since the words are coded dually in two modes, as a result they are learned better than those coded only in one mode. Dual coding provides more paths for retrieval, and as such, helps learners build two types of recall cues in memory. Associating lexical items with different types of media fosters richness of recall cues and increases the likelihood of retention.

Besides, computerized presentation of vocabulary was more appealing than traditional presentation, in this study. As pointed out by Davis and Lyman-Hager (1997), the computer's capacity permits the user to store more extensive glossing than a printed format does, besides, the user is provided with the desired meaning immediately without interruption to look up words in a dictionary.

Also, as stated earlier the multimodal presentation of information made the prominent contribution to vocabulary learning of Iranian EFL learners. In this regard, Wood modifies that, the products that emphasize multimodal learning, often by combining many of the features discussed above, perhaps make the greatest contribution to dynamic vocabulary learning. Multimodal features not only help keep children actively engaged in their own

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learning, but also accommodate a range of learning styles by offering several entry points: When children can see new words in context, hear them pronounced, type them, and cut and paste an accompanying illustration (or create their own), the potential for learning can be dramatically increased.

### **VIII. Conclusion**

The aforementioned findings and discussion have pedagogical and theoretical implications for language learning. Furthermore, they direct our attention to some important designing principles that need to be taken into consideration during the development of instructional multimedia materials. In this regard, the pedagogical implications can be clarified through three perspectives: teaching, learning, and material presentation.

Instructors and program developers should bear in mind to include interesting and relevant visual materials in their programs in order to increase learners' motivation to allocate the required mental effort to learn the unknown words. Moreover, the program should be developed in a more interactive and flexible modes to enhance communication that it should give more options to the user to work with.

Storing information in memory is not supposed to be a difficult task, but retrieving it is expected to be difficult. In order to make the task easy for learners, we can provide multiple retrieval cues by integrating two different forms of mental representations (Al-Seghayer, 2001).

What has been presented above demonstrates that exposing learners to multiple modalities of presentation (printed text, sound, picture, or video) produces a language-learning environment, which can have a real impact on learning. Another pedagogical implication that can be drawn on the basis of the above findings is that "organizing information in working memory seems to be aided by learners making connections between the verbal and visual system, and this helps in linking information to components of the mental model in long-term memory" (Chun & Plass, 1996, p. 517).

In order to create effective multimedia instructional materials, two principles need to be considered: the first principle is that instructional materials designed to accommodate individual differences should combine the use of integrated media. Pusack and Otto (1997) contend that it is important to consider that students may have personal modes or combinations of modes that work best for them as individuals; thus, we must never assume that specific media will be put to the same use or have the same effect on all students. The second principle that needs to be taken into account is that, as indicated by Chun and Plass (1997), the selection of the mode of presentation should be based on how it best supports a particular cognitive process. Cognitive processes are supported by the characteristics of the particular mode. Therefore, an instructional designer should make a sound judgment regarding which mode of presentation is more suitable to a given learning situation. It seems appropriate to conclude this section on implications and design principles by stressing the importance of media combinations in language learning. Information is easy to conceptualize, and the rich learning environment that multimedia instruction captures the learners' attention. Thus, the study of multimedia presentations should, at least, partially provide curriculum

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designers, program developers, and teachers with a better understanding of what accounts for students' success in acquiring target language vocabulary.

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