The Effect of CALL on Vocabulary Learning and Reading Comprehension of Iranian EFL Learners

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Abstract: This study aimed at investigating the effect of a computerized program on developing vocabulary and reading comprehension of Iranian EFL learners. For this aim, the researcher chose a representative sample of sixty first grade female high school students in Bushehr, south of Iran. The participants were divided into two equivalent groups and each group consisted of 30 students. The researcher used three instruments: 1) an achievement test for reading comprehension 2) vocabulary test 3) a computerized program for vocabulary and reading texts included in the English book 1 of high school. The results of the study revealed that the computerized program was effective to develop the vocabulary and reading comprehension skills for first grade high school students. In the light of these findings, the researcher recommends that EFL Iranian teachers should use CALL as a tool for enhancing students' vocabulary and reading comprehension in particular and learning the language in general.

Keywords: CALL, CAVI, Reading comprehension, Vocabulary

I. Introduction

In line with the advancement of technological devices and their effect on education, old methods are replaced rapidly by new methods and Computer-Assisted Instruction (CAI) has been integrated in the teaching-learning process to improve the quality of education. Further, there has been much tendency by English teachers to use the new technology in classrooms and apply these facilities in language teaching. Most schools are being equipped with computer software and new instructional materials and a lot of money is invested on computer-assisted instruction.

The interest in vocabulary acquisition and reading has become a prominent area of research over the past decades with a number of different researchers looking into the relationship between vocabulary knowledge and reading comprehension and various aspects of direct and indirect instruction and learning of vocabulary (Lafer, 2009; Nation, 1990).

Among the four language skills, reading comprehension has always been the main concern of Iranian ESP instructors (Farhadi, 2005; Sajadi & Oghabi, 2011; Tabatabaei, 2007). In a similar vein, Iranian university students regard reading comprehension as the most important skill (Sajadi & Oghabi, 2011).

However, most of Iranian university students have been found to have an insufficient competence in reading academic texts (Fatehi Rad, 2011; Ghalandari & Talebinnejad, 2012; Ghazanfari, 2009, Shokouhi, 2005). The failure of Iranian university students to read academic texts as effectively as they should, can perhaps be language proficiency and vocabulary, lack of familiarity with the content and/or formal schemata of the texts (Carrell & Floyd, 1987; Kasper, 1993) and ineffective reading strategies use (Wood, Motz & Willoughby, 1998, cited in Martinez, 2008).

The teaching of English in schools in Iran starts from the first grade of junior high school with two hours of instruction per week. English instruction continues through the four grades of secondary education with the time allocation of two hours a week. All the English textbooks for the schools are produced by the Ministry of Education. Each lesson includes a variety of sections such as New Vocabulary, Reading, Speak Out, etc. Reading sections are composed of non-authentic passages and the teaching method is based on Grammar Translation Method (Doudman, 2010, Dahmardeh, 2006; Rahimi, 2005).
Reading comprehension is the most important skill in the educational system of Iran and it is also the main concern of Iranian students (Farhadi, 2005; Sajjadi, 2011). Vocabulary is the most important component of reading comprehension and plays a critical role in influencing reading comprehension in both L1 and L2 (Alderson, 2000; Joshi, 2005; Qian, 2002). In spite of its importance, Iranian students consider it a complicated skill and have many problems with it.

Many studies have been done on the effectiveness of computerized programs on reading comprehension (Dreyer & Nel, 2003; Arnold, 2006; Van Wyk & Louw, 2008; Johnson et al., 2010; Esmaili Fard & Nabifar, 2011) which examined the effectiveness of a computer program to test whether it was efficient or not in vocabulary learning (Goode fellow & Lairillard, 1994; Siribodhi, 1995; Koçak, 1997; Gorjian et al., 2011; Naraghizadeh & Barimani, 2013), but few studies have investigated the effect of CALL on both vocabulary and reading comprehension (Chun & Plass, 1996; Tozcu & Coady, 2004).

Present study was done in an EFL context in which English is used as a foreign language. This study aims at investigating the effect of CALL on learning vocabulary and reading comprehension of EFL learners. The purpose of the study is also to compare using computer-assisted instruction with using the traditional method and decide which is more effective for language learning of Iranian EFL learners.

II. Review of literature

The review of literature on second language learning has shown a growing interest in computer-assisted language learning and teaching. Several studies have investigated the role of new technological devices in language learning. Advances and increased availability of computers have developed the field of second/foreign language education. Many studies have indicated the effectiveness of CALL on language instruction (Gonglewski, 2007). They showed that the integration of technology and language instruction has had a tremendous effect on language education.

With the rapid growth of communication and information technology and realizing this fundamental role in educational process, Ministry of Education in Iran tried to equip schools with computers and instructional software. Language teaching and learning has been affected by these new technologies and Computer-Assisted Language Learning (CALL) has entered the curriculum of teaching and learning language skills. Significant use of CALL began in the 1960s but the use of computers was very limited. Since then, the development of CALL software has followed the changes in teaching methodologies (Hah, 1996).

CALL refers to the use of computers in teaching and learning in which computer is used to present, reinforce and assess the materials to be learned (Rahimi & Yadollahi, 2011). Many studies have supported the effect of technology on language learning and promoting students’ learning interests (Stillo, 2000; Kramsch & Anderson, 1999). Several studies indicate that CALL produces an innovative and effective alternative for language instructors (Warshauer & Healey, 1998).

People learn better from words and pictures than from words alone (Mayer, 2005). Words include written and spoken text, and pictures include static graphic images, animation and video. The use of both words and pictures lets the brain process more information in working memory (Sweller, 2005). Mayer (2005) tells us that narration and video is much more effective than narration and text. Similarly, narration and video appear to be more effective than narration, video and text. Narration and text rely on the same channel to process information. When computer is used in conjunction with traditional second language classroom study, students can study more independently, leaving their teacher more time to concentrate on those parts of second language teaching that are still hard by computer. The theoretical rationale behind the multimedia principle is that when both words and pictures are presented, learners are able to establish verbal and pictorial mental models and build effective connections between the two.

Reading is the most important skill of language which enables students to acquire knowledge and develop their academic areas (Al Udaini, 2011). According to Kailani and Muqattash (2008), reading is considered as an additional tool of communication to listening and speaking. People who have no chance to talk with native speakers of the target language can have an access through reading to their literature, journals, and then understand much about their civilization. In this sense, reading is the window through which other cultures can be seen and more general or specific knowledge can be gained.

Reading comprehension is of crucial importance for EFL students, who find it very hard to achieve a good level and cannot even interpret what they are asked to do in simple tasks. More often than not our students of English do not understand what they read. (Barrionuevo, 2006)

In addition, vocabulary plays an important part in second language acquisition and academic achievement. The role that vocabulary knowledge plays in second and foreign language acquisition has long been neglected. However, vocabulary is currently receiving increased emphasis in the language teaching curriculum. This is due to several reasons, such as influence of comprehension-based approaches to language development, the research efforts of applied linguists, and the development of computer-based language corpora (Nunan, 1999).
Some scholars consider vocabulary knowledge as the most important factor in academic achievement for second or foreign language learners. Researchers indicate that vocabulary knowledge is closely linked to reading proficiency, and additionally it leads to greater success in school (Tozcu&Coady, 2004).

Richards and Renandya (2002, p. 255), believe that vocabulary is a core component of language proficiency and much of the basis for how well learners speak, listen, read, and write is provided by vocabulary. They maintain that learners, without an extensive vocabulary and strategies for acquiring novel vocabulary, often achieve less than their potential.

Vocabulary learning has always been a popular subject in CALL programs since the early stages of CALL applications (1980s). In the field of foreign language learning, numerous computer assisted vocabulary instruction (CAVI) treatments have been made to facilitate the complex process of L2 vocabulary learning. CAVI has been considered to be one of the most common applications of CALL. It consists of practices involving the use of computers for vocabulary learning and instruction purposes. Vocabulary learning/teaching has been a highly popular subject matter in computer-assisted language learning applications since the early history of CALL (Chun&Plass, 1996; Cobb, 1999).

As mentioned there is a close relationship between vocabulary and reading comprehension. Learning vocabulary is an important aspect of L2 acquisition and academic achievement and it is vital to reading comprehension and proficiency, to which it is closely linked (Tozcu&Coady, 2004). Vocabulary and reading comprehension are interrelated and good readers as Nation (1990) argued, need to know 2000 to 7000 words and sometimes more if they want to reach native-like fluency. Vocabulary plays an important part in reading comprehension and techniques that are used for vocabulary development also benefit reading comprehension, and vice versa (Constantinescu, 2007). Also, reading helps in vocabulary acquisition by creating opportunities to infer word meaning from context. Vocabulary plays a pivotal role in understanding a text. Thus vocabulary is a central aspect of language learning in general and reading comprehension in particular (Tozcu&Coady, 2004).

Multimedia help not only recalling new words, but also acts as facilitators of reading comprehension, which stresses the close relationship between vocabulary and reading comprehension (Chun&Plass, 1996).

III. Method

3.1. Design of the study

The study was conducted using an experimental pretest and posttest design. Participants were randomly assigned into experimental and control groups. The treatment was done on experimental group through CALL and the control group had their usual classes using the traditional method of teaching.

3.2. Participants

Participants in this study included 60 students who were selected randomly from a body of 105 students. The subjects were divided into experimental and control groups, each group consisting of 30 students and their first language was Persian. Both groups had the same teacher. The groups were a sample from a female high school in Bushehr where the researcher worked as a teacher of English.

3.3. Instruments

The teaching materials of the study included reading comprehension and vocabulary software, English book 1 of high school which was accompanied with a CD and some slides which had been designed by the researcher and also some parts of English Way series which were related to vocabulary and reading comprehension of the textbook and also some texts for improving students’ reading comprehension. Testing instruments were Oxford Placement Test (OPT) which consisted of 20 questions and 4 passages to check students’ reading comprehension ability and the other test was a vocabulary test which was designed by the researcher. They were used for homogenizing the subjects and were applied for both pre-test and post-test.

3.4. Data collection procedure

The study was conducted using an experimental pretest and posttest design. Participants were randomly assigned into experimental and control groups. The treatment was done on experimental group using CALL and the control group received the traditional method of teaching. Both groups took a pre-test to establish initial differences or similarities in their knowledge in English reading comprehension and vocabulary. After the pretest the treatment began which lasted 6 weeks. The control group took the lessons in their classroom with white board, markers, their own textbook (English book 1) and a work book, while the experimental group had the lesson in the class room which was equipped by computer and video projector.

All students received 4 hours of instruction per week. After 12 treatment sessions, the posttest was conducted immediately for the two groups. The posttest was the same as pre-test which included Oxford Placement Test (OPT) and the vocabulary test.
3.5. Data Analysis

Data Analysis was conducted using Statistical Package for Social Sciences (SPSS), which is a computer program developed to analyze data in research studies in Social Sciences. In order to answer the research questions, first, the performances of control and experimental participants on vocabulary and reading comprehension were compared with the aid of independent-samples t-test. Another independent-samples t-test was also employed to see the possible differences between the experimental and the control participants at the end of the study.

IV. Results

In order to answer the research questions, a pre-test was administered for the participants of all groups to see if participants in both the control and the experimental were homogenous in both vocabulary knowledge and reading comprehension. The design of the study was based on an analysis of Independent Samples T-Test to see if there were any statistically significant differences between the results of the two groups. Table 4.1 shows the mean comparison of reading comprehension pre-test for both groups of the study.

Table 4.1: Comparison of experimental and control groups on the reading comprehension pre-test

<table>
<thead>
<tr>
<th></th>
<th>Levene's Test for Equality of Variances</th>
<th>T-test for Equality of Means</th>
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<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
</tr>
<tr>
<td>Post test</td>
<td>.177</td>
<td>.675</td>
</tr>
<tr>
<td>Equal variances</td>
<td>assumed</td>
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</table>

Table 4.1 shows that there was no significant difference between the reading performance of the control and experimental groups on the reading pre-test at the beginning of the study. So, two groups were homogenous at the beginning of the study. Significance level (0.94) is higher than .05 (p= .94 > .05).

In order to examine the difference between the experimental and control group in vocabulary knowledge, participants performances and their means were scored. Table 4.2 shows the mean comparison of vocabulary pre-test for two groups of the study.

Table 4.2: Comparison of experimental and control groups on the vocabulary pre-test

<table>
<thead>
<tr>
<th></th>
<th>Levene's Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
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<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
</tr>
<tr>
<td>Post test</td>
<td>.000</td>
<td>.986</td>
</tr>
<tr>
<td>Equal variances</td>
<td>assumed</td>
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</table>

According to Independent-Samples T-Test, there was not a statistically significant difference between the pre-test results of experimental participants and control participants in vocabulary test. So, two groups were homogenous in vocabulary knowledge. Significance level (0.93) is higher than 0.05 (p= .93 > .05).

When the post-test was administered for all groups, the next step in data analysis was to score the participants’ performances in reading comprehension posttest. Table 4.3 shows the comparison of reading comprehension posttest for both groups at the end of the study.

Table 4.3: Comparison of groups on the reading comprehension post-test

<table>
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<tr>
<th></th>
<th>Levene's Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
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<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
</tr>
<tr>
<td>Post test</td>
<td>.116</td>
<td>.734</td>
</tr>
<tr>
<td>Equal variances</td>
<td>assumed</td>
<td></td>
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</table>

According to Table 4.3 the t-test analysis shows that there were statistically significant differences at the (p ≤ 0.05) level for the achievements of the experimental group compared with the achievement of the control group in the area of reading comprehension (p=.019<.05).
This rejects the second null hypothesis that states that Computer-assisted EFL instruction has no effect on students’ learning reading comprehension. So, it can be inferred that CALL method could be more effective than the traditional method for teaching English reading comprehension. Table 4.4 below shows the comparison of vocabulary posttest for both groups in this study.

<table>
<thead>
<tr>
<th>Table 4.4: Comparison of groups on the vocabulary post-test</th>
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<tbody>
<tr>
<td>F</td>
</tr>
<tr>
<td>---</td>
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<tr>
<td>Post test</td>
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</table>

The results show that there are considerable differences between the mean scores of experimental and control group (t= 2.357 p=.022<.05). The difference between the mean scores of the post-test of the experimental group was more considerable than that of the control group. The mean scores of the two groups in post-tests show that the participants of the experimental group outperformed their counterparts in the control group. Results of the t-test also indicated that the null hypothesis (Computer-assisted EFL instruction has no effect on students’ learning vocabulary) was rejected and computer instruction had significant effect on students’ vocabulary learning.

V. Discussion

According to the obtained results, there was a statistically significant improvement in the vocabulary and reading comprehension observed in the experimental participants after a six-week instruction through CALL. The results of the t-tests from the post-test administration also indicated that the experimental group who received instruction through CALL had a better performance than the control group who did not. Thus, the findings suggest that using computer in teaching vocabulary and reading comprehension is beneficial for the learners.

In a similar way, the control group has also demonstrated development after a six-week of regular traditional classes, but the development of the experimental group is significantly higher than the control group.

Another point in the results was that students’ reading comprehension scores in both pretest and posttests were lower than their vocabulary scores. It shows the students’ difficulty in reading comprehension in comparison to vocabulary; however, their reading comprehension improved much through using computerized program. Reading comprehension is of crucial importance for EFL students, who find it very hard to achieve a good level and cannot even interpret what they are asked to do in simple tasks. More often than not our students of English do not understand what they read. (Barrionuevo, 2006)

According to the literature, the text comprehension can be facilitated by multimedia aids such as pictures animations and other visual or auditory cues. Though they are independent of the presentation mode of the text, multimedia aids support the process of text comprehension. The aids for text comprehension can be presented not only in textual form, but also in visual or auditory form, or in their combination (Dreyer & Nel, 2003; Arnold, 2006; VanWyk & Louw, 2008; Johnson, et al., 2010).

VI. Conclusion

The findings suggest that achievement is significantly affected by the medium of instruction, as marked differences are found between the achievement of traditionally- and computer-instructed participants. The results of the study indicated that, the experimental groups improved their vocabulary and reading comprehension significantly at the end of the six-week CALL instruction. When the development that all groups achieved was compared, the experimental group’s development for group A in both vocabulary and reading comprehension were found to be higher than the control group’s vocabulary and reading comprehension development. This finding is similar to the literature on teaching language which suggests that the integration of CALL instruction into language teaching learning is more effective than solely employing traditional methods. As Rogers (1996) states, when computer is used in conjunction with traditional second language classroom study, students can study more independently, leaving their teacher more time to concentrate on those parts of second language teaching that are still hard by computer. According to Mayer (2005), the theoretical rational behind the multimedia principle is that when both words and pictures are presented, learners are able to stabilize verbal and pictorial mental models and build effective connections between the two.
Therefore, English teachers should be acquainted with the tremendous effect of CALL on language learning and be instructed to use technology in language teaching/learning process and try to improve students’ reading comprehension through improving their vocabulary knowledge and computerized program.

Regarding future studies, several lines of inquiry can be recommended. The present study was conducted with only intermediate level participants, for further studies a wider scope of samples can be employed and different age group and proficiency levels can be conducted. In this research, gender differences among the participants were not taken into account, but future research may examine CALL effectiveness in relation to gender differences. A replication of this study with a larger number of participants is needed in order to obtain reliable and generalizable results, since the small size of the sample (N=60) sheds doubt on the validity of the observed significance.

Lastly, a six-week period is not enough for a language skill to develop. Therefore, for future research studies, the period can be extended and instruction can be applied for a longer time period. Therefore, they suggest conducting the same study over a longer period of time, such as one whole semester, in order to achieve more valid and more reliable results.

References


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Appendices

Appendix (A): English book 1 grade 1

LESSON SEVEN

A. New Words

1. Some birds can fly high in the sky. They can find their way easily. They don't get lost.

Do birds fly?
Can they find their way?
Do they get lost?

2. This is the bough. The moon shines in the sky.

What do you see in the picture?
Where is the moon?

3. I get up early during the week. During the weekend I go to bed later.

Do you go to bed early during the week?

Do you go to bed early during the week?

Do you go to bed late during the weekend?

Do birds need rest?

Are there six in this room?

The distance from our house to my school is one kilometer.

How far is it from our house to my school?

How many meters are there in a kilometer?

B. Practice Your New Words

Fill in the blanks with correct words from the list.

get lost, fly, on, during, distance, asleep, still

1. I can walk the ———— in about 1 hour.

2. The old is ———— on the wall.

3. Some birds cannot ————

4. If you don't know your way, you may ————

5. He is ———— working. He won't finish his work before he goes to bed.

6. We don't go to school ———— the summer.

7. He is ———— working. He won't finish his work before he goes to bed.

Appendices

Appendix (A): English book 1 grade 1
Appendix (B): Oxford Placement Test (OPT)

Oxford University Press
and
University of Cambridge Local Examinations Syndicate

Oxford Placement Test

Version 1.1

This test is divided into three parts:
Part One (Questions 1–40)
Part Two (Questions 41–60)
Part Three (Writing section)

Questions 6–10

- In this section you must choose the word which best fits each space in the text below.
- For questions 6 to 10, mark one letter A, B or C on your Answer Sheet.

Scotland

Scotland is the north part of the island of Great Britain. The Atlantic Ocean is on the west and the North Sea on the east. Some people (6) ................. Scotland speak a different language called Gaelic. There are (7) ................. five million people in Scotland, and Edinburgh is (8) ................. most famous city.

Scotland has many mountains; the highest one is called ‘Ben Nevis’. In the south of Scotland, there are a lot of sheep. A long time ago, there (9) ................. many forests, but now there are only a (10) ................. .

Scotland is only a small country, but it is quite beautiful.

6 A in          B on          C at
7 A among      B between     C about
8 A your       B his         C its
9 A is         B was         C were
10 A little     B few         C lot
Appendix (C): Vocabulary test

Name: ………………..     English Exam          High school                Grade One

C. Choose the best answer.

1. He was asleep when his mother ………… the house.
   a) Leave      b) leaves     c) leaving           d) left

2. He can walk the distance ………… about 2 hours.
   a) in               b)on                 c)at          d)to

3. The pan is on the fire. The water in the pan is boiling. So ………
   a) don't keep it out of reach of the children.
   b) the children have to put their hands in this pan.
   c) you have to keep it out of reach of the children.
   d) Let the children wash their hands in the pan

4. When summer ………… we’ll go to the country.
   a) comes   b)come          c)came            d) will come

5. My uncle is a………… . He can fix your car.
   a) teacher               b) butcher                c) mechanic               d) baker

6. Will you ………… the radio, please? Its voice is very loud
   a) turn off              b) turn down            c) turn on                  d) turn up

7. -They will ……………… a new way to solve the problem.
   a) happen b) discover c) turn d) grow

8. I'm a ………… of our school football team.
   a) member b) number c) waiter d) farmer

9. You should buy more fruits. One kilo is not………..
   a. real b. enough c. light d. above

10. The fire made the water in the kettle very ………
    a) deep                b) hot                c) cold               d) fun

11. If you put your hand in hot water, you will ………… it.

12. …………did you ………… to get the ticket for the next show?
    a) boil b) stay c) succeed d) change

13. I don’t understand the foreigner………..  .
    a. at all b. all over c. early d. loudly

14. When spring comes, the birds will come back again. They always do. And they’ll return to the same place.
    a) When spring comes, the birds fly to a different place.
    b) The birds fly high when spring comes.
    c) The birds always return to other places in spring.
    d) In spring the birds fly back to the same place.

15. Some birds migrate thousands of miles. They don’t have maps show them the way but they don’t get lost.
    This means that they ……………………. .
    a) can find their way if they have maps.
    b) get lost without maps,
    c) can find their way without maps.
    d) don’t get lost because they have maps.