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The Impact of Computer–Assisted Language Learning (CALL) /Web-Based Instruction on Improving EFL Learners' Pronunciation Ability

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Abstract

The purpose of this study was to investigate the effect of CALL/Web-based instruction on improving EFL learners' pronunciation ability. To this end, 85 students who were enrolled in a language institute in Rasht were selected as subjects. These students were given the Oxford Placement Test in order to validate their proficiency levels. They were then divided into two groups of 30 and were randomly assigned to two treatment conditions (experimental and control). A pre-test of pronunciation was administered to two groups, then the students were exposed to the treatments for 12 sessions. The CALL/Web-based instruction was used in the experimental group while conventional methods were employed in the control group. Based on the statistical analysis, there found to be a significant difference between the performance of the control and the experimental groups. The findings also displayed that the web-based learning was effective in enhancing learners' motivation in improving pronunciation. The findings of the present study may have implications for L2 learners, teachers, and materials developers.

Keywords: computer assisted language learning (CALL), web-based instruction/learning, pronunciation skill

1. Introduction

The past few decades have seen a dramatic rise in the number of teachers using computers and the Internet in their classrooms. As Al-Jarf (2005) defined CALL as an approach to language teaching and learning in which computer technology is used as an aid to the presentation, reinforcement, and assessment of the material to be learned, usually including a substantial interactive element. Levy (1997) defines CALL as the search for and study of applications of the computer in language teaching and learning.

Today, World Wide Web emerges as a potential language learning resource, which has received much attention over the past decade. Crossman (1997) holds that in comparison with other instructional technologies, Web-based learning is growing faster than any other technology. Foreign language (FL) teachers are often challenged by the ongoing debate on how to teach pronunciation across proficiency levels. While some teachers feel there is often not enough class time to practice pronunciation, including intonation or prosody (Munro & Derwing, 2007; Ramírez-Verdugo, 2006), others may not enjoy nor know how to teach pronunciation, or they may believe that students simply find it boring (Stevick, Morley, & Wallace Robinett, 1975).

Furthermore, some teachers may be reluctant to teach pronunciation due to lack of training in phonetics (Weinberg & Knoerr, 2003). Teaching pronunciation in a class specific to pronunciation, phonology, or phonetics may seem more feasible than in a typical language classroom. However, these types of classes normally only occur in the upper levels, so students in beginning language classes could be deprived of systematic pronunciation training until late in their language learning careers (Lara Ducate & Lara Lomicka, 2009).

Iranian EFL students are studying English in their home country where English is not the dominant native language. Students who are from environments where English is not the language of the country have very few opportunities to hear the real pronunciation; these students therefore are not accustomed to hearing the language as it is produced by native speakers for native speakers. Authentic materials refer to oral and written language materials used in daily situations by native speakers of the language (Rogers & Medly, 1988).

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Regarding the application of the behaviorist theory of language learning in relation to the use of technology in informal language learning environment, Rogers (2004) notes that the behaviorists have worked well in explicit teaching and computer-assisted instruction but they would not be suitable for learning informally from exposure to audio/visual mass media. Many multimedia experts believe that using multimedia technologies in language setting has great advantages for learning.

Regarding the above discussion, the following question is formulated:

1. Is there any significant difference between the mean scores of the group taught using CALL-based/web-based methods and the group taught using traditional methods?

In view of the above question, the present study tries to provide empirical supports for the following hypothesis:

HO1. There is not any significant difference between the mean scores of the group taught using CALL-based/web-based methods and the group taught using traditional methods.

2. Review of the Literature

2.1 Computer Assisted Language Learning (CALL)

The abbreviation CALL stands for Computer Assisted Language Learning. It is a term used by teachers and students to describe the use of computers as part of a language course (Hardisty & Windeatt, 1989). It is traditionally described as a means of 'presenting, reinforcing, and testing' particular language items. The learner is first presented with a rule and some examples and then answers a series of questions which test her/his knowledge of the rule and the computer gives appropriate feedback and awards a mark which may be stored for later inspection for the teacher.

Jones and Fortescue (1988) indicate that the traditional description of CALL is unfortunate and they present the computer as flexible classroom aid which can be used by teachers and learners in and out of class in a variety of ways and for a variety of purposes. However, work with the computer, as any other teaching aid, needs to be linked with ordinary classroom work and CALL lessons, like the other lessons, need to be planned carefully.

According to Gale (1991), learners are more eager and motivated in Web-based instruction. Web-based instruction may have multiple dimensions of use in education. Kahn (1997) refers to eight frameworks for meaningful learning in Web-based learning; Pedagogical, Technological, Interface design, Evaluation, Management, Resource Support, Ethical, and Institutional. Later, Kahn (2001) proposed a framework for using Web-based instruction ranging from ‘macro’ to ‘micro’ uses. All these have one feature in common: Internet or World Wide Web.

Web-based learning continues to attract the attention of researchers (Dlaska, 2002; Lin & Hsu, 2001; Liou, 2001; Liou & Yang, 2002; Sun, 2003). Theoretically, Web-based instruction is a suitable environment for learning language. It allows teachers to practice with their students individually or in small groups. Many studies have been conducted to investigate the effect of Web-based instruction on language learning. As an example, Stepp-Greany (2002) examined students’ perceptions of using multimedia for language instruction. She found that most of the students agreed that instruction was facilitated in the multimedia environment. According to Chaudron (2001), a historical review of technology in language learning and teaching offers more insight into the role that computers have had in the language learning classroom.

In a study conducted by Fletcher and Atkinson (1972), the participants of the experimental group received computer-assisted language instruction 8-10 minutes a day for five months; the rest of the day was the same for all students. The findings showed that the students who received computer-assisted instruction performed better than those who did not. In studies carried out by Allen and Thomposn (1994), Beyer (1992), Chambless and Chambless (1994), Davis and Mahoney (1999), and Hart (1992), it was reported that telecommunication technology, electronic mail, using computer in the classroom and computer-assisted writing software enhance the quality of writing instruction.

Getkham (2004) examined the vocabulary performance of students in two groups: one used conventional texts and the other used multimedia computer programs. By comparing the results of immediate and delayed post-tests, the researcher found that the degree of forgetting of vocabulary in the multimedia group was less than the group in which texts were printed. The researcher also concluded that multimedia computer programs can help learners retain vocabulary.

In another study, Al-Jarf (2004) investigated the effects of Web-based learning and conventional learning on EFL learners’ writing. He found that using Web-based instruction as a supplement in conventional classes has significant effects on writing structure. The study also examined the effects of instructional technology and distance learning.

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Based on the results, a significant causal relationship was found between students' learning and on-line instruction. It was reported that the experimental group performed better than the comparison group.

The study done by Razavi and Ketabi (2011) set out to investigate the differences between 2 types of instruction materials- websites vs. textbooks- and their effects on the learners' knowledge of certain grammatical rules. To reach their aims, the researchers chose 120 Iranian intermediate EFL learners and put them into 3 groups: text-book group, website group, and control group. After giving a pre-test to all learners, the instructor used two grammar teaching text-books to teach learners in text-book group. While for those in website group, the same grammatical rules were taught on line via teaching websites. After the treatment phase, a post-test was administered to measure the gains. On the whole the findings of this study manifested that websites, as a new medium for instruction, can increase learners' motivation and improve their performance. In other words, the integration of web-based materials in language learning classrooms can enhance learners' mastery of English grammar.

In a similar vein, Al-Mansour and Al-Shorma (2012) carried out a study in which 60 university students were randomly selected and assigned to experimental and control groups. The experimental group used the computers alongside the traditional method and the other group used the traditional method alone. Both groups were subjected to a pretest immediately before starting the treatment and the same test was administered as a post-test immediately after it. Data collected from this study indicated that students taught through computer assisted language instruction showed better achievement than those who were taught through the traditional method alone.

In a recent study, Rahimi and Yadollahi (2011) investigated the relationship between attitudes toward computer-assisted language learning among 130 female students of high school. A CALL questionnaire turning out students' attitude towards computer-assisted language learning was used. Based on the results of this study, Iranian female students showed positive attitudes toward CALL. The truth of the matter is here that individuals' attitude can impact on their behaviors directly or indirectly. As a result of the attitude-behavior relationship, a positive attitude towards computer-assisted learning brings about using computer and technology in the context of learning. Vice versa, it has been found that a negative attitude may lead to computer resistance.

2.2 Research on Pronunciation

2.2.1 Comprehension Studies

There are many studies that have investigated global non-native pronunciation to assess what factors affect pronunciation (Piper & Cansin, 1988; Thompson, 1991), help improve pronunciation (Derwing & Rossiter, 2003; Graeme, 2006; Lord, 2005; Magen, 1998; O'Brien, 2004; Ramírez-Verdugo, 2006; Riney & Flege, 1998), and contribute to accent and comprehension (Brennan & Brennan, 1981; Jilka, 2000; Munro & Derwing, 2007). While the age that someone begins learning a FL seems to have the largest effect on pronunciation (Piper & Cansin, 1988; Thompson, 1991), studies have shown that training can also help to improve students' pronunciation (Graeme, 2006; Lord, 2005; Ramírez-Verdugo, 2006).

After two weeks of training on specific sounds, Graeme (2006) found that the average error rate dropped from 19.9% to 5.5%, and in a delayed post-test to 7.5%, which illustrates that focused instruction can lead to phonological changes. In another study, members of an experimental group improved significantly after listening to native speakers (NSs) and comparing their own speech with the NSs' (Ramírez-Verdugo, 2006).

In a Spanish phonetics class, students who received explicit phonetics instruction improved their pronunciation on specific features (Lord, 2005). The findings of these studies show that "raising [second language (L2)] learners' awareness of the important role of intonation systems is an attainable aim" (Ramírez-Verdugo, 2006, p. 153) that can finally help to improve students' FL pronunciation. In addition to comprehension, prosody represents another important aspect of pronunciation. Prosody is defined as the "patterns in individual words of stress, pitch, and tone and rhythmic and intonational patterns of longer utterances" (Pennington, 1989, p. 22).

As Munro and Derwing (1995) found, the presence of a strong accent does not necessarily hinder intelligibility; in their study, some speakers were rated as heavily accented even though the listeners understood everything. The researchers attribute this apparent contradiction to the effects of inaccurate prosody. Since prosody has been found to be one of the main reasons speech can be perceived as accented, even more than individual sounds, (Anderson-Hsieh & Koehler, 1988; Munro, 1995; Pennington, 1989), prosody training for students at all levels is recommended as part of communicative language teaching (Chun, 1988; O'Brien, 2004; Pennington, 1989; Van Els & de Bot, 1987; Volle, 2005). As learners tend to use L1 (first language) intonation patterns when speaking in the L2 (Ramírez-Verdugo,

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2006), they need to be explicitly taught the prosody of the L2. Using technology is one way to achieve this practice, as well as practice in comprehension and accentedness.

2.2.2 Using Technology to Improve Pronunciation

Technology has been used in various ways to improve students' pronunciation. Since students often have a difficult time hearing their own pronunciation mistakes and judging the nativelikeness of their speech, visual displays can help to show specific sounds and the patterns of prosody (Ehsani & Knodt, 1998; Hardison, 2004; Martin, 2004; Pennington, 1989; Ramírez-Verdugo, 2006; Seferoglu, 2005).

Automated speech recognition (ASR) tools such as WinPitch for example, are advantageous because they do not rely on students' own perceptions of their pronunciation, but they show exactly how their sounds compare to those of NSs (native speakers) (Ehsani & Knodt, 1998; Martin, 2004; O'Brien, 2006). However, O'Brien (2004) has pointed out one drawback of ASR (automatic sound recognition) tools which is their lack of contextualization. Technology could offer opportunities for contextualizing tasks while simultaneously improving pronunciation.

There has been a large body of research addressing the effects of computer assisted language learning from various perspectives (Abouseileek, 2011; Marzban, 2011; Rahimi & Yadollahi, 2011). Few numbers of studies, however, investigated the effects of computer learning on pronunciation skills (Arias, Yoma & Vivanco, 2010).

3. Methodology

3.1 Participants

Sample population in this study was consisted of 60 Iranian female students studying English in an institute in Rasht, Iran. The participants were randomly divided into two experimental and control groups. Each group was consisted of 30 students and their mother tongue was Persian. Both experimental and control group classes were held 3 sessions (one hour and a half) per week lasting for one month. The teacher was the same for the control and experimental groups.

3.2 Materials

The different materials which were used in this study include:

a) Oxford Placement Test (OPT): In order to validate the level of the participants and form a homogeneous group, participants were given the Proficiency Test of OPT. The Oxford Placement Test is designed to measure a test taker's ability to understand a range of grammatical forms and the meanings they convey in a wide range of contexts. It also measures the extent to which learners can use these language resources to communicate in English language situations.

b) Teaching materials: the teaching materials included words from *English Pronunciation in use* book *(Jonathan Mark, 2007).*

c) Pronunciation Test: A test consisting of 60 words from *English Pronunciation in use* book *(Jonathan Mark, 2007)* was given to the experimental and control groups at the beginning and end of the course. Each individual learner was required to read the words loudly and the teacher recorded their voices. This test was considered to measure the subjects' pronunciation skills before and after the implementation of the treatment.

c) Website: English Pronunciation Practice (ManyThings.org): It is used to practice sounds with the minimal pair quizzes and sentence rhythm and intonation with the Listen & Repeat Machine. http://www.manythings.org/e/pronunciation.html

3.3 Procedures

The following procedures were adopted in order to meet the objectives of this study.

Step1: Among 85 participants taken the OPT test, 60 students were determined to be at the same level of proficiency. They were randomly assigned to two different groups of 30: one experimental group and one control group. The treatments were given over a period of one month, 3 days a week. The syllabus in both groups was the same except that in the control group, there was no multimedia tool (i.e. computer). All computers in the experimental classrooms were connected to the Internet. The participants' experience of computer and the Internet, ranged from 2-5 years.

Step2: The pronunciation test as a pretest was administered and all the participants were interviewed individually to ensure that there was no significant difference between two groups in terms of pronunciation skills.

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Step3: The participants were given their treatments, during which half of the participants were instructed through web-based/CALL based activities, in which they practice pronunciation of English vocabularies through computer, and the other half applied the conventional method for learning the pronunciation of the words and never used computer. The researcher used http://www.manythings.org/e/pronunciation.html: English Pronunciation Practice (ManyThings.org) as an instrument for experimental group. It is used to practice sounds with the minimal pair quizzes and sentence rhythm and intonation with the Listen & Repeat Machine.

Step4: After one month of treatment, pronunciation test as a post-test was administered for two groups.

4. Results

Table 1 presents the descriptive statistics and independent sample t-test analysis of pronunciation test held as a pretest. As it can be clearly seen, the mean score of the experimental group (18.70) is higher than the control group (17.30). However, the independent sample t-test did not show any significant difference in the mean scores of the control and experimental groups on the pronunciation test ($t = 1.86$, $df = 58$, $p > .05$); thus, ensured the researcher of the homogeneity of both experimental and control groups in terms of their pronunciation skills at the entry level.

Table 1. The descriptive statistics and independent sample t-test analysis of pronunciation test held as a pre-test

	Group	N	Mean	Std. Deviation	Std. Error Mean	T	Df	*P*
Pretest	Control	30	17.30	1.65	.38	1.86	58	.075
	Experimental	30	18.70	1.62	.37	1.86		

Table 2. The descriptive statistics and paired sample t-test analysis of pronunciation test held as a pre-test and post-test

	Group	N	Mean	Std. Deviation	Std. Error Mean	T	Df	*P*
Pre-test	Control	30	17.30	1.65	.38	-1.89	29	.07
Post-test			18.80	2	.46			
Pre-test	Experimental	30	18.70	1.62	.37	-15.75	29	.000
Post-test			21.05	1.34	.32			

Table 2 presents the results of paired sample t-test run to compare the performance of the control and experimental groups separately on the pronunciation pretest and post-test. According to this table, there was a significant difference between the mean scores on pronunciation pretest and post-test of the experimental group ($df = 29$, $t = -15.75$, $p < 0.05$), but there was no significant difference between the mean scores on pronunciation pretest and post-test of the control group ($df = 29$, $t = -1.89$, $p > 0.05$). These results revealed that only participants in the experimental group taking part in computer assisted learning course improved regarding their pronunciation skills.

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Table 3. The descriptive statistics and independent sample t-test analysis of pronunciation test held as a post-test

	Group	N	Mean	Std. Deviation	Std. Error Mean	T	Df	*P*
Posttest	Control	30	18.80	2	.46	8.54	58	.000
	Experimental	30	21.05	1.34	.32			

Table 3 presents the descriptive statistics and independent sample t-test analysis of pronunciation test held as a post-test. As it can be seen, the mean score of the experimental group (21.05) is higher than the control group (18.80). Also, the independent sample t-test indicated that the experimental group performed significantly higher than the control group on the pronunciation test ($t = 8.54$, $df = 58$, $p < .05$). This means that the very implementation of computer assisted language learning helped the experimental group pronounce the English words significantly better than the control group; thus, the hypothesis that there is not any significant difference between the mean scores of the group taught using CALL-based/Web-based methods and the group taught using traditional methods was disconfirmed.

5. Discussion

With respect to the question of the study, "Does web-based instruction have any effect on Iranian EFL learners' pronunciation ability?" the results of the study proved that using websites as a tool was effective in fostering the experimental group students' pronunciation. There were statistically significant differences between the mean scores of the experimental group on the pronunciation pre-test and post-test in pronunciation proficiency in favor of the post-test scores. The students who were engaged in their learning recognize that their pronunciation improved after treatment. The findings of this study nearly reflect the results gained by Al-Mansour and Al-Shorma (2012) asserting that using computer-assisted materials alongside the traditional method has a positive effect on the students' achievement. These findings are also in line with the results gained by Razavi and Ketabi (2011) who conducted the integration of web-based materials in language learning classrooms can motivate the learners and improve their performance. In addition, this finding is compatible with the finding of Al-Jarf (2004) who found that using Web-based instruction as a supplement in conventional classes has significant effects on writing structure.

6. Conclusion

Data analysis in this study indicated that CALL technology has a positive effect on students' performance in their pronunciation ability. Prior to the treatment, the independent-sample t-test was administered to find out any significant difference in pre-test mean scores between students in experimental and control group. The findings revealed that both groups were equal in their performances at the beginning of the study. After the treatment, the independent sample t-test was done to find out any significant difference in pronunciation post-test mean scores between students in both groups. The findings indicated that students in experimental group showed significant improvement in their pronunciation compared with the students in control group. The findings of this study will be highly invaluable for teachers, material developers, and instructors to consider the usefulness of online instructional materials and invest more in designing and applying such materials.

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