



## The effect of computer–assisted language learning (CALL)/web-based instruction on EFL learners' general and academic self-efficacy

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**Abstract:** The purpose of this study was to investigate the effect of CALL/Web-based instruction on EFL learners' general and academic self-efficacy. To this end, 110 male and female intermediate level Iranian EFL learners were randomly assigned to two treatment conditions (experimental and comparison). The CALL/Web-based instruction was used in the experimental group, while conventional methods were employed in the comparison group. A general and an academic self-efficacy questionnaire were administered to the participants of both groups prior to and after the treatments. Also, the participants' proficiency level was checked using their scores on the Michigan Test of English Language Proficiency (MTELP). The ANCOVA procedure was used to analyze the obtained data. Results revealed that CALL/Web-based instruction had a significant effect on learners' general and academic self-efficacy. The participants of the experimental group experienced significant improvements in their level of general and academic self-efficacy compared with the comparison group participants. The findings of the present study may have implications for L2 learners, teachers, and materials developers.

**Key words:** Web-based instruction . CALL . Motivation . General self-efficacy . Conventional methods

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### INTRODUCTION

In the era of booming information and technology, the role of computer and the Internet in teaching English is undeniable. Crossman (1997) holds that in comparison with other instructional technologies, Web-based learning is growing faster than any other technology. Nowadays, computers and Web-based instruction have become more powerful, faster, easier to use, more convenient and cheaper. Hence, the demand for using computers and the Internet has increased (Gündüz, 2005). With different types of hyperlinked multimedia documents and computer-assisted language learning instruments, the Web can help instructors to incorporate Web resources into the classroom (Son, 2007; Warschauer, 2001). Bangs and Cantos (2004) believe that in the age of information and communication technology (ICT), computer literacy is a necessity.

One issue of increasing importance is learner beliefs about their potentials. This is known as self-efficacy. Self-efficacy, grounded in the theoretical framework of Bandura's Social Cognitive Theory (SCT), is defined as

“judgments of individual's ability to organize and execute courses of action” (Bandura, 1986, p. 391). According to Bandura (1986), self-efficacy refers to the belief that people have about themselves in completing a task. Similarly, Aliegro (2006) believes that self-efficacy is one's abilities in performing a task, which contribute to enhanced effort and persistence. As it can be seen from the definition of self-efficacy, self-efficacy has been found to influence learner beliefs. It may also influence how strategic they may be when dealing with a task (Pajares & Johnson, 1996; Pajares & Miller, 1994).

Many studies have been carried out to investigate various aspects of self-efficacy, as well as the factors that may influence it. However, there seems to be a paucity of research on how CALL/Web-based instruction may influence EFL learners' self-efficacy. Therefore, this study aims at answering the following questions:

1. Is there a significant difference between the effects of CALL/Web-based instruction and conventional teaching methods on Iranian EFL learners' general self-efficacy?

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2. Is there a significant difference between the effects of CALL/Web-based instruction and conventional teaching methods on Iranian EFL learners' academic self-efficacy?

## REVIEW OF RELATED LITERATURE

In order to understand how CALL/Web-based instruction influences general and academic self-efficacy, there is a need to develop a clear understanding of each of them.

**Computer-assisted language learning (CALL) / web-based instruction:** Computer technology has been explored by many researchers (Chang & Lehman, 2002; Gale, 1991; Guthrie & Richardson, 1995; Liou, 1997; Van Aacken, 1999). 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.

Also, Smith (2004) holds that "computer technology can provide students with the means to control their own learning, to construct meaning and to evaluate and monitor their own performance" (p.1). CALL originated from Computer-Assisted Instruction (CAI); it was considered as assistance for teachers in 1960s (Lepper & Gurtner, 1989). According to Davies, Hewer, Rendall, and Walker (2004), till the late 1970s, CALL was restricted to universities. With the advent of personal computers in the late 1970s, computers came into the range of wider access of audience, and this led to the development of CALL programs. Therefore, Computer-Assisted Language Instruction (CALI) changed into Computer-Assisted Language Learning. The history of CALL can be classified into three parts: behavioristic CALL, communicative CALL, and integrative CALL (Warschauer & Healey, 1998).

Behavioristic CALL was developed in the late 1960s and used largely under the effect of Audio lingual teaching method in the 1970s. According to Warschauer and Kern (2005), the "programs were designed to provide immediate positive or negative feedback to learners on the formal accuracy of their responses" (p. 8). Warschauer and Kern (2005) believe that this approach has some disadvantages; the aim of the program was repeating the same materials, and there was no excitement among teachers and students. But recently, Warschauer shows a significant difference in his publication, and he names this approach structural CALL (e.g. Warschauer & Healey, 1998).

By the 1980s, personal computers provided the possibility of working for individuals at school, and the behavioristic approach was being rejected at theoretical and pedagogical levels. Communicative CALL is similar to cognitive theories which emphasized that learning was a process of discovery, expression and development. In communicative CALL, emphasis was on what students did with each other while they were working with the computer (Warschauer & Healey, 1998).

According to Underwood (1984), communicative CALL has some features; for example, it allows students to create original utterances, focuses on using forms; it is flexible, and it generates a natural environment for using the target language. Warschauer and Kern (2005) believe that the advantage of this approach is that it allows learners to construct new knowledge from their existing knowledge by exploration, problem solving and hypothesis testing.

In the 1990s, communicative CALL began to be criticized. This period was the time when communicative approach to language teaching was being rejected and emphasis was on using language in authentic social contexts. Interactive CALL is integrated with multimedia technology. It focuses on two important multimedia developments of the last decade: multimedia computers and the Internet. In the process of language learning, students are able to use a variety of technological tools or hypermedia (Warschauer & Healey, 1998).

In the context of language learning, hypermedia offers some advantages. First, it provides a more authentic learning environment. Second, skills are combined in one single activity. Next, students have control over their learning; and they work together (Warschauer, 1996). Recent research has demonstrated that content delivered in Internet-based conditions may be more efficient than that provided in conventional classrooms (Abdous & Yoshimura, 2010).

Web-based learning continues to attract the attention of researchers (e.g. 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 posttests, they found that the degree of forgetting of vocabulary in the multimedia group was less than the group in which texts were printed. They concluded that multimedia computer programs can help learners to 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. 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.

**Self-efficacy:** According to Pajares (1996), self-efficacy in online learning is considered as a key psychological factor for learners' success because it can change learners' perceptions of their learning situations. Additionally, Brown (2008) claims that self-efficacy influences individual' decisions, aims, and their amount of effort in managing a task. According to Alivernini and Lucidi (2011), self-efficacy helps learners to adjust and deal with the unfamiliar learning situation, even when they have little experience (Swan, 2004).

Generally, self-efficacy refers to feelings of an individual in doing particular tasks (Bandura, 1997b). According to Bandura, general self-efficacy should be related to personality or individual difference variables, positive and negative feeling, job representation, and satisfaction. General self-efficacy, which is a stable sense of individual competence, refers to judgments of people about how they cope effectively with a broad range of stressful or challenging environments (Luszczynska, Scholz, & Schwarzer, 2005; Schwarzer & Jerusalem, 1995; Sherer et al., 1982).

Also, Bandura (1997b) asserts that individuals with low self-efficacy have low self-esteem and are hopeless about their achievement. Therefore, self-efficacy is related to positive and negative emotions. Generalized sense of self-efficacy appears to be a universal construct producing meaningful relations with other psychological constructs (Luszczynska et al., 2005).

Many studies have explored the connections of this sense with other psychological constructs. In this regard, Gutierrez, Luszczynska, and Schwarzer (2005) investigated general self-efficacy in various domains of human functioning, highest positive associations (e.g. self-esteem; self-regulation, and positivism) and highest negative associations (e.g. anxiety and depression). To this end, 8796 participants from Costa Rica, Germany, Poland, Turkey, and the USA were examined. Results showed a significant relationship between general self-efficacy and psychological constructs.

As to the relationship between general self-efficacy and social cognitive variables, behavior self-efficacy, health behaviors, and well-being, Luszczynska et al. (2005) studied 1933 students in Germany, South Korea, and Poland. The results showed meaningful relations with other psychological constructs.

According to Hill and Hannafin (1997), in CALL-based instruction, computer self-efficacy is one of the most important and noticeable factors in determining the success of individuals' performance. Computer self-efficacy is described as the perceived confidence regarding one's ability to use computer (Compeau & Higgins 1995; Murphy, Coover, & Owen, 1989).

Additionally, Tsai and Tsai (2003) believe that general Internet self-efficacy relates to individuals' perceptions about their abilities to use the Internet, while Internet-based learning self-efficacy relates to individuals' confidence and self-beliefs about their own abilities to manage an online learning activity (Yukselturk & Bulut, 2007). There are those like Pen, Tsai, and Wu (2006), who believe that internet self-efficacy is of two kinds, general Internet self-efficacy and communicative Internet self-efficacy. General Internet self-efficacy is concerned with basic functions and goals, while communicative self-efficacy is concerned with communication and interaction.

In a study, Wu and Tsai (2006) investigated the attitudes of 1313 Taiwanese university students' towards general Internet self-efficacy. The results of the study revealed a positive relationship between students' attitudes and Internet self-efficacy and communicative Internet self-efficacy. Similarly, Pen et al. (2006) carried out a study on 1417 Taiwanese university students. They found that students who used the Internet showed higher communicative Internet self-efficacy than other students.

Terry and Doolittle (2008) examined the effect of Web-based tools on the self-efficacy of students by engaging

participants in a time management strategy. 64 undergraduate and graduate students were involved in the Web-based time management tool. The results of the study revealed that involvement with online time management tools increased self-reported time management behaviors. However, there was no significant correlation between students' self-efficacy and online learning environment. In another study, Duan, Wu and Zhang (2001) examined learners' self-efficacy beliefs of distance learning, and its relation to learners' characteristics. Based on the results, learners showed positive distance self-efficacy. Moreover, Pan (2008) found a significant relationship between students' self-efficacy and technology integration. The self-efficacy of the participants was also found to be affected by prior experience with the computer. In a similar study, Castagnaro (2012) reported a positive and significant correlation between self-efficacy and using technology in the classroom.

Furthermore, there are several studies claiming that computer use may affect students' self-efficacy and attitudes toward computer. In one such study, Celik (2015) investigated the effects of a computer course on self-efficacy, computer attitude, and achievement of young individuals. He concluded that the computer course affected self-efficacy, attitude and achievement level of the participants.

According to Bandura (1997b), sources of self-efficacy in online environments are influenced by prior experiences with online learning systems, online learning technology tension, teacher feedback, pre-course training, and the factors that enact mastery experience, social persuasion, and affective situations (Bates & Khasawneh, 2007). Bandura (1994, 1977) and Bandura, Caprara, Barbaranelli, Gerbino, and Pastorelli (2003), suggested four experiential sources for development of self-efficacy; Mastery experiences, vicarious experiences or Modeling, Physiological Factors and Social persuasion.

The most effective way of creating strong self-efficacy is mastery experiences because they are based on real life experience (Bandura, 1997a). According to Bandura (1997a), results of performance and past experiences of students are the most important source of self-efficacy. Learners' success enhances self-efficacy, but failures may destroy it (Bandura, 1997a, 1994). According to Bandura (1998), "Successes build a robust belief in one's personal efficacy. Failures undermine it, especially if failures occur before a sense of efficacy is firmly established" (p.53).

The second way of creating self-efficacy is through vicarious experiences or modeling. According to Bandura (1994, 1997a), vicarious experience is modeling. It allows an individual to imagine oneself in someone else's situation without the possible negative results. The effect of modeling on self-efficacy is

strongly influenced by seeing the similarity of models. It allows learners to compare themselves with others without any negative results (Bandura, 1994). Most people try to choose models for themselves from among others. Hence, the success of the selected model increases a person's self-efficacy, particularly when there are a lot of similarities between the individual and the chosen model.

Social persuasion constitutes the third source of self-efficacy. Learners develop their self-efficacy through verbal messages and social persuasions they receive from others: parents, classmates, and teachers (Bandura, 1994).

Finally, physiological and emotional states pertain to people's physical and affective conditions during task completion. Mood or attitudes are necessary for developing high self-efficacy (Bandura, 1994). Positive feelings give learners a good sense of achievement and high self-efficacy, while negative moods cause stress, tension, fatigue, and low levels of self-efficacy.

Generally, academic self-efficacy relates to learners' perception of academic learning (Girasoli & Hannafin, 2008). By applying academic self-efficacy to academic areas, researchers open new horizons in different aspects of language learning and teaching. There are those like Altunsoy, Çimen, Ekici, Atik, and Gökmen (2010), who believe that academic self-efficacy is learners' beliefs about the ability to achieve tasks in their classwork. According to Schunk (1991), the concept of academic self-efficacy refers to persons' beliefs that they can do a given academic task successfully at designated levels. Midgley et al. (2000) give a similar definition. Lent, Brown, and Larkin (1984) believe that academic self-efficacy is related to standardized test scores and high school rankings. Odaci (2011) found that "students' belief in their academic self-efficacy and their ability to begin and continue their studies is also highly important" (p.1110).

Pintrich and De Groot (1990) believe that academic sense of efficacy is positively related to intrinsic value and cognitive and self-regulatory strategy use and negatively related to anxiety. Also, it is related to different result measures, grades, scores on exams and quality of texts and essays. Additionally, Bassi, Steca, Della Fave, and Caprara, (2007) conducted a study with 130 Italian students with high and low self-efficacy. During one week, the participants dealt with different academic tasks, and their personal skills were controlled. Based on the findings of the study, learners with high self-efficacy were more motivated than the low level ones. According to Zimmerman (2000), self-belief has appeared as an effective predictor of learners' motivation and learning.

In line with the above study, Flowers (2011) investigated students' academic self-efficacy in online

courses versus the conventional approach. The results of the study showed that levels of self-efficacy in online and conventional environments were similar.

Students have opportunities to learn via the Internet in Web-based instruction; so, their self-efficacy may influence their views and learning outcomes in Internet-based instruction. In a study by Joo, Bong, and Choi (2000), the relationship of academic self-efficacy, and self-efficacy for self-regulated learning, Internet self-efficacy, and learners' performance in a Web-based context was investigated, and a positive correlation was found between computer self-efficacy and students' success. Also, Goulão (2014) investigated the relationship between self-efficacy and academic achievement of adult learners in an online context. The results showed a significant and positive correlation between self-efficacy and academic achievement.

In line with the above studies, Hoffman and Spataru (2008) reported that in Internet-based instruction, students with higher self-efficacy perform better than students with lower self-efficacy. In another study, Ferla, Valcke and Cai (2009) found that academic self-concept influenced academic self-efficacy beliefs, and it was a better mediator for affective motivational variables, whereas academic self-efficacy was the better mediator for academic achievement.

Additionally, Siew and Wong (2005) conducted a study with 74 graduate English as Second Language (ESL) pre-service-teachers in Malaysia. They investigated the relationship between language learning self-efficacy and language learning strategies by two author-designed questionnaires. The results showed a highly significant correlation between language learning strategies and language self-efficacy.

Based on the above review, it may be concluded that various aspects of self-efficacy have been investigated, and so have the various aspects of CALL/Web-based instruction. However, there seems to be a paucity of research on the effect of CALL/Web-based instruction on improving general and academic self-efficacy. This study is an attempt to partially fill this gap.

## METHOD

**Participants:** The participants of the present study initially included 110 (male and female) Iranian EFL students at various language institutes in Qazvin, Iran. Ten of the students did not answer the Michigan test, leaving a total number of 100 participants and their age ranged from 15 to 30. Three other participants were excluded from the study because of extremely high or low levels of proficiency measured with the Michigan Test of English Language Proficiency. Hence, the final number of the participants was 97.

**Instrumentation:** In the present study, the following instruments were utilized:

**a. Michigan test of English language proficiency (MTELP):** to homogenize the participants in terms of their level of proficiency in English, the MTELP was used. The MTELP used in the present study was a 100-item multiple choice test consisting of three sections, measuring learners' grammar, vocabulary, and reading comprehension. The test included 40 items on grammar, 40 items on vocabulary, and 20 items on reading comprehension.

**b. General self-efficacy:** a General self-efficacy scale was used to measure the participants' self-efficacy. This scale, which was a modified version of Sherer's general self-efficacy, consisted of 12 items (Bosscher & Smit, 1998). The choices included 1 disagree strongly, 2, disagree moderately, 3, neither agree, nor disagree, 4, agree moderately, and 5, agree strongly. The higher scores indicated higher levels of self-efficacy.

**c. Academic self-efficacy:** the participants' academic self-efficacy was measured using Chemers, Hu, and Garcia's (2001) questionnaire. It included 8 items. The participants were asked to report on a scale from Disagree Strongly to Agree Strongly.

**d. Teaching materials:** the teaching materials included Iran Language Institute Intermediate (1, 2, & 3) student books. They included 8 units from page 1 to 122.

**Procedure and Data Analysis:** First, to homogenize the participants, a general proficiency test (MTELP) was administered at the beginning of the study to make sure that there was no significant difference among the participants in terms of their proficiency level. They were given 60 minutes to complete this proficiency test. In order to select a homogeneous group of participants, their scores on the MTELP were checked; those participants whose score was less than one standard deviation away from (above or below) the mean were selected as the participants of the study, and the rest were excluded from all subsequent analyses.

In the second stage, the participants were informed of the purpose of the study to remove any possible source of anxiety. The participants were randomly assigned to two groups: experimental and comparison. The treatments were given over a period of 10 weeks, 2 days a week. The syllabus in both groups was the same, except that in the conventional 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.

In the third stage, the general and academic self-efficacy questionnaires were given to all the participants. The participants had 30 minutes to complete these questionnaires. Then, the participants were given their treatments, during which half of the participants were instructed through web-based/CALL-based activities, and the other half received conventional classroom instruction.

Each session proceeded in the following way. In the CALL-based instruction group, a variety of specialized EFL texts were sent to students through e-mails before each session. All the participants were required to read and answer different questions. For example, the instructor posted an essay about global warming to each student. They were asked to do some activities, for example, answering different types of questions, finding names of clean cities and looking for some vocabulary items about pollution, checking grammatical points, writing a short composition about pollution in Iran. They then shared and posted it to other classmates through e-mails, chatrooms or any other electronic devices, and after receiving comments from others, they emailed it to the teacher. The students were encouraged to use online references and dictionaries. Other activities included downloading pictures, games, chatting, etc. They could do their homework online with the help of other classmates or people. Having done these activities, they attended their class. One of the students read a text in his/her book and discussed it with his/her classmates. The instructor commented on their discussion, and then they surfed the Internet to find ways of controlling global warming

and pollution. Finally, they read their findings for their instructor and classmates.

The participants of the comparison group were taught through conventional methods of teaching (blackboard, book, workbook, pencil, chalk and paper) without the use of any multimedia. They were expected to read the text of their books and to write answers to exercises in their workbooks in the classroom. At the end of each session, they had to read their answers to exercises for their classmates and instructor. The instructor wrote some sentences on the board, and the learners were asked to respond to them for the following session. At the end of the experimental period, all the participants were asked to respond to the same questionnaires again. The obtained data were then submitted to statistical analysis. To analyze the obtained data, two separate ANCOVA procedures were used.

## RESULTS AND DISCUSSION

**Investigation of the first research question:** The first ANCOVA procedure was run to see the effects of CALL/Web-based instruction on Iranian EFL learners' general self-efficacy. Table 4.1 summarizes the results of the descriptive statistics.

Table 1: Descriptive Statistics for general self-efficacy

Group	Mean	Std. Deviation	N
experimental	38.44	4.75	59
comparison	32.47	4.66	38
Total	36.10	5.53	97

Based on Table 1, it can be seen that the experimental group, which received CALL/Web-based learning, has a higher mean score ( $\bar{x}=38.44$ ) than the comparison group ( $\bar{x}=32.47$ ). In order to see whether or not the observed difference between the groups was

statistically significant, the test statistics were also checked. The results of the ANCOVA are given in Table 2.

Table 2: Test statistics for the ANCOVA on general self-efficacy

Source	Type II Sum of Squares	D f	Mean Square	F	Sig.	Partial Eta Squared	Non cent. Parameter	Observed Power b
Corrected Model	1577.27a	2	788.63	54.36	.00	.53	108.72	1.00
Intercept	996.41	1	996.41	68.68	.00	.42	68.68	1.00
general pre	754.32	1	754.32	51.99	.00	.35	51.99	1.00
Group	1034.06	1	1034.06	71.27	.00	.43	71.27	1.00
Error	1363.69	94	14.50					
Total	129374.00	97						
Corrected Total	2940.96	96						

a. R Squared = .536 (Adjusted R Squared = .526)

b. Computed using alpha = .05

As Table 4.2 shows, there is a significant difference between the effects of CALL/Web-based instruction and conventional instruction on Iranian EFL learners' general self-efficacy. Meanwhile, it can also be seen from Table 4.2 that there was a significant difference between the groups on the pre-test. So, care must be exercised in interpreting the results. That is why the index of the strength of association was checked, based

on which 43% of the variance between the two groups was attributable to the effect of the independent variable. This means that the remaining 57% of the variance is left unaccounted for. In addition, the cook's distance was checked and there was nothing wrong with it.

**Investigation of the second research question:** The second research question of the study aimed to find out

the effects of CALL/Web-based instruction on Iranian EFL learners' academic self-efficacy. To this end,

another ANCOVA procedure was run. Table 3 presents the results of the descriptive statistics.

Table 3: Descriptive Statistics for academic self-efficacy

Group	Mean	Std. Deviation	N
experimental	29.49	4.72	59
comparison	26.39	3.98	38
Total	28.27	4.68	97

It can be seen in Table 4.3 that the experimental group has a higher mean score ( $\bar{x}$ = 29.49) than the comparison group ( $\bar{x}$  =26.39). In order to see whether the observed

difference between the groups was statistically significant or not, the test statistics were also checked. The results of the ANCOVA are given in Table 4.

Table 4: Test statistics for the ANCOVA on academic self-efficacy

	Type II Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power <sup>b</sup>
Corrected Model	337.43 <sup>a</sup>	2	168.71	8.98	.00	.16	.97
Intercept	2591.18	1	2591.18	137.91	.00	.59	1.00
Academic pre	115.77	1	115.77	6.16	.01	.06	.69
Group	228.46	1	228.46	12.16	.00	.11	.93
Error	1766.04	94	18.78				
Total	79671.00	97					
Corrected Total	2103.485	96					

a. R Squared = .160 (Adjusted R Squared = .143)

b. Computed using alpha = .05

As Table 4 shows, there is a significant difference between the effects of CALL/Web-based instruction and conventional instruction on Iranian EFL learners' academic self-efficacy. However, it can also be seen that there was a significant difference between the groups on the pretest. Hence, care must be exercised in interpreting the results. That is why the index of the strength of association was checked, based on which 11% of the variance between the two groups was attributable to the effect of the independent variable.

**Discussion:** Based on the findings of the present study, there is a significant difference between the effects of CALL/Web-based instruction and conventional instruction on Iranian EFL learners' general and academic self-efficacy. This finding partially approves those of Duan et al, (2001), who reported that learners showed higher self-efficacy in distance learning context. In addition, this finding is compatible with the finding of Pan (2008), who found that computer-based language materials have the potential to improve learners' self-efficacy. Moreover, the finding of the present study lends partial support to Castagnaro's (2012) findings, based on which there was a positive and significant correlation between self-efficacy and using technology in the classroom. In addition, the finding partially approves that of Hoffman and Spataru (2008), who concluded that in Internet-based instruction, students with higher self-efficacy perform better than students with low self-efficacy

On the other hand, this finding is in conflict with those of Terry and Doolittle (2008) and Flowers (2011), who reported no significant correlation between students' self-efficacy and online learning environment.

The findings of this study are not altogether unexpected. There may even be intuitive support for the findings. For example, the reason why CALL/Web-based instruction turned out to be more effective in this study could be explained partially by the fact that this type of learning is attractive, and, as a result, motivating to learners. It also allows for interactive situations, which are believed to improve learning.

Based on the results, it can be concluded that Iranian students will have higher self-efficacy in online contexts. These findings also confirm those of Goulão (2014), who found a significant relationship between self-efficacy and academic achievement of learners in online context. The findings suggest that students' self-efficacy may have a great effect on their learning outcomes in Internet-based situations

The finding of the present study may have been affected by a number of factors such as students' level of proficiency, gender differences, personality of the learners, and multiple intelligences. All of the participants of this study were EFL learners; however, some of the afore-mentioned studies were carried out in ESL contexts (e.g. Siew & Wong, 2005).

Another factor may have been the number of students. This study was conducted with a small sample of participants (110). According to Caban (2004), a more significant change in self-efficacy will be evident with a larger sample of participants. Another possible factor may be learners' level of proficiency. The participants of this study were all at intermediate proficiency level. With participants at other proficiency levels, one might expect different results. Still another factor could have been the age of the participants. The participants of this

study were between the ages of 15 to 30. So, one of the reasons why we came up with different results was probably because of the differences between the age level of the participants in this study and in other studies. At the same time, for manageability reasons, variables like gender, multiple intelligences and other personal traits were not considered.

## CONCLUSION

The findings of the present study showed that CALL/Web-based instruction has the power of promoting positive self-efficacy beliefs among learners. Since it has already been shown that self-efficacy has a direct and positive effect on learning (Hoffman & Spataru, 2008; Pascarella & Terezini, 1991), it may be concluded that if language teachers wish to improve their learners' achievement, one way of doing so would be through boosting their levels of self-efficacy. As the effect of CALL/Web-based instruction is undeniable, the present study can help teachers and learners to have a better understanding of CALL/Web-based instruction in educational settings.

By means of CALL/Web-based instruction, teachers can create a pleasant situation for teaching and keep learners interested and motivated. Students also can have a better comprehension with less difficulty. Consequently, as CALL/Web-based instruction creates a pleasant environment, facilitate learning, help retention of materials in learners' mind, and relieve the burden of teachers, they can be useful for both teachers and learners.

In short, it is hoped that the findings of the present study can provide insights for teachers as well as learners. The findings of this study can help teachers encourage their students to use CALL/Web-based learning to improve their general and academic self-efficacy. Language teachers are advised to provide more opportunities for students to learn in CALL/Web-based instruction rather than in conventional methods. Learners may also find learning much easier and possibly more fun if they discover the merits of CALL/Web-based instruction. Furthermore, teachers can find better ways to help learners explore their ability as language learners and support them in developing their self-efficacy. The finding may have significant implications for curriculum developers in that they may design activities in course books that encourage teachers to incorporate CALL/Web-based instruction in their classes.

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