Technology and Self-Efficacy Collaboration: A Case of Vocabulary Improvement

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Abstract

The current study aimed to demonstrate the influence of computer-assisted activities on the improvement of Iranian EFL learners' vocabulary and their self-efficacy. Furthermore, it attempted to explore the relationship between technology-supported vocabulary learning and EFL students' self-efficacy. A number of 120 EFL students participated in the research who were categorized into two groups of control and experimental. They were asked to answer the self-efficacy-beliefs questionnaire and vocabulary pre- and post-test at the outset and the end of the study after ten treatment sessions. The experimental group experienced vocabulary learning by using computer-assisted learning activities and the control group went through traditional instruction. The findings demonstrated that the participants of the experimental group who experienced technology-based instruction outperformed in the vocabulary test. On the other hand, there was no significant relationship between self-efficacy and vocabulary learning. Finally, the pedagogical implications of this study for L2 teachers and learners were presented.

Keywords: C*omputer-Assisted Learning, Self-efficacy, Vocabulary*

Introduction

Vocabulary acquisition is considered as one of the most challenging facets of language learning which requires extensive time and attention for L2 learners. Learning "8000–9000- word families for reading, and perhaps as many as 5000–7000 families for oral discourse" (Schmitt, 2008, p. 329) is an overwhelming task for language learners.

It is claimed that vocabulary is the most important components of language learning since support learners to be able in learning four language skills (Nation, 2001; Richards & Renandya, 2002; Schmitt, 2010). Likewise, Balci and Çakir (2011) have confirmed that vocabulary has a crucial role in every stage of the learners' language development. Besides, it is impossible to communicate without the requisite words. In fact, communication can occur without syntax and grammar, but not without vocabulary (Lewis, 1993; Folse, 2004). As Boers and Lindstromberg (2008) declared, if learners

have no vocabulary, they are unable to express their ideas, thinking or feelings along with they cannot understand the meaning of written or spoken texts. Thus, vocabulary learning is an important realm to reach an acceptable language proficiency level.

One of the most effective methods in language learning, in general, and vocabulary learning, in specific, is integration of technology in learning. With advancement in information technology, many innovative ones, such as the electronic whiteboard and all-in-one computers, have been widely used for supporting educational activities, especially language learning. These technologies not only facilitated the learning effects but also increased students' interest in learning (Schmid, 2008; Smith, Higgins, Tang & Austin, 2009). Stablishing technology-supported classrooms for language learning has great potential for improving learning skills, enriching their contents, and enhancing knowledge development (Solhaug, 2009; Wheeler, Waite & Bromfield, 2002). In these classrooms, teachers can effectively employ technologies to increase students' motivation in learning and promote collaborative learning (Hall & Higgins, 2005; Schmid, 2008; Slay, Sieborger & Hodgkinson-Williams, 2007).

Recently, Computer Assisted Language Learning (CALL) materials have been introduced through a variety of software (Purgina, Mozgovoy, & Ward, 2017). Technological advances offer more opportunities and chances to augment vocabulary learning. According to Ellis (1995, p. 74), "CALL has numerous roles in the general training of explicit skills for memorizing the meaning of vocabulary, and in the particular presentation of mnemonic mediators for specific items of vocabulary". Besides, he confirmed the essential educational role of computers as programmed providers of drill, practice, and test.

Cognitive variables are among the effective factors in language learning; therefore, in explaining one's ability to learn a new language, the learner's cognitive variables must be investigated. through Social Cognitive Theory (Bandura, 1986), scholars confirm how affective variables contribute more to the result of L2 learning than do aptitude, intelligence, the methodology used to teach in the classroom, or even the time spent on learning the language (Kennedy et al. 2000).

According to McKenna et al., (1995, cited in Gee, 1999) , there is a diverse set of variables considered as the affective side of second language learning, variables such as attitudes, motivation, interest, learners' beliefs, needs, expectations, and prior

experiences (Rahimi & Abedini, 2009). For instance, Bandura (1997) and Yang (1999) declared that learners' beliefs in their capabilities affect performance tremendously and can predict performance better than their real ability. According to Bandura (1986), self-efficacy beliefs are responsible for the knowledge learners seek and for the outcomes, they expect, it determines the choices learners make. Moreover, self-efficacy beliefs are a determiner of how much effort learners will put into an activity and how long they will stand their ground in achieving a task (Bandura, 1986).

Bandura (1986) regarded self-efficacy as an essential element in the Social Cognitive Theory and defined it primarily as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (p.391). Linnenbrick and Pintrich (2003), and Mills, Pajares, and Herron, (2007) emphasized on indispensable role of self-efficacy on learning and considered it as a good predictor for the success of the learner.

Literature Review

Using computer technologies in educational and instructional contexts can be considered as a powerful idea because students spend a lot of time on these online networking activities (Mazman, 2010). In recent years, many researchers have examined the effect of multimedia materials on second language learning. For instance, Getkham (2004) compared the vocabulary performance of two groups of students; one group used a multimedia computer program and the other one used traditional printed texts. Findings showed that both groups improved their vocabulary knowledge after practicing vocabulary exercises, but the students in both groups forgot some words after one month. However, the degree of forgetting of vocabulary in the group, which used multimedia, was less than that of the group that used printed texts. The results confirmed that a multimedia computer program could help students retain vocabulary information.

In another study, Licenjacka and Filologia (2007) investigated two alternative methods of learning words (i.e., traditional and CALL-based). The control group was asked to study a series of adjectives within a period of seven days without any access to technological equipment and the word processing software. They were left free to memorize the lexis in the way they chose themselves. On the other hand, the experimental group was given the access to the word processing and they have

opportunity to learn the new lexicon via computers in seven days. They found that the experimental group had a better performance in terms of learning adjectives.

In the context of Iran, Ghabanchi and Anbarestani (2008) examined the effect of CALL programs on the long-term retention of vocabulary. Besides, they tried to find whether CALL programs have a better effect on contextualized vocabulary learning than the ordinary method of learning vocabulary in isolation through bilingual lists. The result indicated that learners had an intensive mental processing in using CALL, which resulted in long-term recall of words. CALL also produced better results in contextualized vocabulary learning and pronunciation.

In another research conducted in Iran, Shahrokni (2009) probe into the influence of online textual, pictorial, and textual pictorial glosses on the incidental vocabulary learning. The students were asked to read the text for comprehension and, at the same time, they could consult the glosses attached to the target words. The results indicated that a combination of text and still images resulted in significantly better incidental learning, confirming the Dual-Coding Theory.

Comparing a CALL-based and a non-CALL based approach in vocabulary teaching, Bagheri, Roohani and Nejad Ansari (2012) conducted a study. They recruited 61 Iranian EFL learners as participants. The findings of this study illustrated that the function of the CALL users and non-CALL users on the L2 vocabulary test were not significantly different in the immediate and delayed posttests.

In an experimental study, Akhlaghi and Zareian (2015) examined the effect of PowerPoint presentations on grammar and vocabulary learning of Iranian pre-university EFL learners. The experimental group was taught by using PowerPoint presentations while the other group (control group) was taught using a traditional method of instruction in classroom setting. The findings indicated that PowerPoint presentations enhanced the learners' grammar and vocabulary knowledge. It was also found that the learners had a positive attitude towards the use of PowerPoint presentation.

In their study, Jafari and Chalak (2016) investigated the role of WhatsApp in Iranian EFL learners' vocabulary knowledge. Using a mixed method design, a group of 60 students including 30 male and 30 female students at junior high level participated in the study. The experimental group received vocabulary instructions electronically four days a week for four weeks using the Whats App while the control group was taught

vocabularies of their textbook inside the classroom by traditional method. The results showed that using Whats App had a significant role in students' vocabulary learning.

Mousavi and Nemati (2017) tried to investigate the influence of using vocabulary software on Iranian EFL learners' vocabulary learning. A number of 54 learners were randomly divided into two groups of control and experimental. They participated in a teacher-made test of vocabulary as pre-test. The control group received vocabulary instruction through traditional method, while the experimental group was taught through software version of the same book. The results showed that both methods had positive impacts on learners' vocabulary learning, while using vocabulary learning software was more effective than using printed book.

Hajebi, Taheri, Fahandezh, and Salari (2018) probed in to the effect of web-based language learning on EFL learners' vocabulary improvement. The participants were 66 EFL learners who were categorized into an experimental group and a control group. The results revealed outperformance of experimental group who experienced web-based language compared to their counterparts in control group.

There is a bulk of study working on self-efficacy, for instance, Huang and Chang (1998) conducted a study on the relationship between reading and writing self-efficacy and achievement with four ESL students from highest-level reading and writing classes. The results revealed that, students' self-efficacy is higher than their learning achievements and the participants' interest and the teacher's support influence their self-efficacy.

Ho (2005) conducted a study to investigate the relationships between self-efficacy, collective efficacy, and English and mathematics performance of students. The result showed that self-efficacy was considered as an important factor for performance of English and mathematics.

Mills et al. (2007) explored the relationship between self-efficacy efficacy, anxiety, and gender on the listening and reading proficiency. The results revealed that there is a significant relationship between reading self-efficacy and reading proficiency for all students and there is a relationship between listening self-efficacy and listening proficiency only for female students. The finding showed that self- efficacy for self-regulation is a strong predictor of the achievement and female students revealed greater self-efficacy for self-regulation.

Rahemi conducted a study in 2007 and examined English self-efficacy and EFL achievements among students with low proficiency levels majoring in humanities at the senior high school. The analysis of the data displayed that students of humanities had no tendency toward English and did not enjoy positive English self-efficacy.

Li and Wang (2010) explored the relationships between reading self-efficacy and the use of reading strategies in an EFL context. The students were second year of English students in China University answered two questionnaires. The findings revealed that reading self-efficacy was in a positive and significant way related to the use of reading strategies.

Wang, Schwab, Fenn, and Change (2013) tried to examine the relationship between self-efficacy and self-regulated learning strategies that learned English and Germany. They conducted a study with the purpose of comparing between Chinese and German participants. Self-efficacy showed similar results between both Chinese and Germans. The results also imply that female students in both group got low level in English test but they showed higher levels of self-efficacy.

Onoda (2014) investigated the correlation between self-efficacy, effort regulation strategies, and English vocabulary skills of college students majoring in English. Through structural equation modeling, the findings of a survey indicated that self-efficacy significantly predicted use of effort regulation, which in turn affected the development of L2 vocabulary skills.

It is confirmed that learners with high levels of self-efficacy perform better than those with lower levels of self-efficacy in the technology supported settings in learning vocabulary. Students with high level of self-efficacy perform tasks better than those with low level of self-efficacy (Rimm-Kaufman & Sawyer, 2004). Therefore, it might be a question whether technology use and self-efficacy affect students' performance in vocabulary learning strategies. There is dearth of research done on the relationship between the learners' use of technology mediated classes, and their self-efficacy beliefs and vocabulary learning strategies used by.

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question whether technology use and self-efficacy affect students' performance in vocabulary learning strategies. There is dearth of research done on the relationship between the learners' use of technology mediated classes, and their self-efficacy beliefs and vocabulary learning strategies used by. Therefore, the present study tried to shed light on the impact of technology-supported activities and tasks on the improvement of Iranian EFL learners' vocabulary and their self-efficacy. The current study tried to investigate how Iranian EFL learners' vocabulary learning was affected by technology-based activities using computer assisted language learning material searching for the relationship between technology-supported vocabulary learning and EFL students' self-efficacy. Based on the research objectives, the following research questions were proposed:

1. Does technology use have any significant impact on Iranian EFL learners' vocabulary improvement?
2. Is there any significant relationship between Iranian EFL technology-supported vocabulary learning and their general self-efficacy?

Methodology

Participants

The participants of the present study were 120 students who were selected based on availability sampling; they were EFL students. These participants were 60 female and 60 male EFL learners. The native language of the participants was Persian, while they were learning English as a foreign language in private language institutes. The learners' ages were ranged from 15 to 17 years.

Instrumentation

Two instruments were utilized to gather the required data including a Self-efficacy Questionnaire and a Vocabulary Learning Test.

Self-efficacy Questionnaire

The Persian Adaptation of the General Self-efficacy Scale constructed by Nezami, Schwarzer, and Jerusalem (1996) was used to collect data. It was used both in pre-test

and post-test sessions searching for the EFL learners' level of self-efficacy. It contains ten questions attempting to assess the self-efficacy concerning learning English as a second language. It uses four-point Likert scale (including 'Not at all true', 'Hardly true', 'Moderately true', 'Exactly true').

Vocabulary Learning Test

The other instruments employed were two vocabulary multiple-choice tests including pre-test and post-test. The researcher-made tests, comprising of 40 items, were served as pre-test and post-test administered to the participants before and after the treatment to determine whether there was any gain in the scores of the participants as a result of the treatment.

Data Collection Procedure

The researchers recruited 120 EFL learners based on availability sampling; the participants were randomly assigned to an experimental group and a control group.

After explaining the aims and objectives of the study to the participants, all the selected participants (experimental and control groups) took part in the vocabulary pre-test.

The researcher randomly categorized the participants into two groups of non-computer based and computer-based classrooms. Both groups went through 10 sessions of vocabulary learning, while, experimental groups experienced vocabulary learning by using computer assisted learning activities and control group went through traditional instruction. At the end of treatment session, both groups were asked to answer vocabulary post-test. It should be noted that the pre- and post-tests were the same for both groups.

In the experimental group, the instructor and students used computer and its related soft wares to teach and learn. The computer soft wares (Roj and Khate Sefid) were used in the experimental group, with words and phrases which show the spelling, translation, pronunciation, and images. The teaching of vocabulary lasted about 15 minutes each time.

At the end of the 10 treatment sessions, both groups took part in the vocabulary test and answered the self-efficacy questionnaire.

Data Analysis Procedure

Descriptive statistics for the pre-test and post-test were performed for both experimental and control groups. An Independent samples t-test was applied to check if there was any significant difference between the vocabulary pre-test of both groups; besides, two paired samples t-test were run to show the difference between the pre-test and post-test scores within each group. Also, an independent sample t-test was run to compare groups' self-efficacy difference. Furthermore, the relationship between self-efficacy and vocabulary was examined using Pearson product-moment correlation coefficient.

Results

The present study tried to shed light on the impact of technology-supported activities on the improvement of EFL learners' vocabulary and their self-efficacy. It was an attempt to find the relationship between technology-supported vocabulary learning and EFL students' self-efficacy.

Piloting Results

In order to assure the reliability of the instruments, pilot studies were conducted; Table 1 reports the results of reliability of instruments in piloting.

Table 1. Reliability Statistics

Instrument	Cronbach's Alpha	N of Items
Pre-test	.874	40
Post-test	.846	40
Questionnaire	.778	10

Based on the above table, all the instruments were reliable, the reliability of pre- and post-tests were .87 and .84 respectively, and that of questionnaire was .77.

Descriptive Results

Table 2. Descriptive Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
	Control	60	14.116	2.804	.362

vocabulary pre-tests	Experimental	60	13.841	3.509	.453
vocabulary post-test	Control	60	15.483	2.533	.329
	Experimental	60	16.891	2.507	.323
self-efficacy	Control	60	3.248	.4265	.082
	Experimental	60	3.303	.5665	.073

According to the above table, the pre-test mean score of control group in vocabulary test was 14.11, while it was 13.84 for the experimental group.

Besides, the table declares that, the post-test mean score of control group in vocabulary test was 15.48, while it was 16.89 for the experimental group.

The post-test mean score of self-efficacy of control group was 3.24, while it was 3.3 for the experimental group.

Comparing Pre-tests of Vocabulary Test and Self-efficacy of both group

The researcher ran an independent sample t-test comparing the pre-test mean scores of vocabulary before the mediation sessions in order to be assure that there were no significant differences between the experimental and control group with regard to their vocabulary level.

The pre-test mean score of control group in vocabulary test was 14.11, while it was 13.84 for the experimental group. An independent sample t-test was run in order to compare these groups' pre-test mean scores.

Table 3. Independent Samples Test of Pre-tests of Vocabulary

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	3.051	.083	.474	118	.636	.275	.58002	-.873	1.423
Equal variances not assumed			.474	112.5	.636	.275	.58002	-.874	1.424

Table 3 indicates that, there was no statistically significant difference between vocabulary pre-test mean scores of control and experimental group (t= -.47, df = 118, sig (2-tailed) = .636 > 0.05). So, these two groups can be regarded as homogeneous with regard to their vocabulary knowledge before treatment sessions.

Comparing Pre-test and Post-test of Vocabulary Test of Experimental Group

A paired samples t-test was utilized to show whether there was a statistically significant difference between the pre-test and post-test scores within experimental group.

Table 4. Comparing Experimental Group Performance in Pre-post Test

	Paired Differences							
				95% Confidence Interval of the Difference				
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
vocabulary	-3.05000	2.18760	.28242	-3.61512	-2.48488	-10.80	59	.000

According to the results of the above table, the increase of post-test mean scores of vocabulary test (t= -10.80, df = 59, sig (2-tailed) = .000< 0.05) was statistically significant compared to pre-test score.

Comparing Self-efficacy of Groups

The researcher ran another independent sample t-test comparing the post-test mean scores of self-efficacy after the mediation sessions in order to be compare the experimental and control group with regard to their self-efficacy level.

Table 5. Comparing Experimental Group Performance in Pre-Post Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	2.63	.107	-.62	118	.535	-.05333	.08570	-.223	.116
Equal variances not assumed			-.62	114.74	.535	-.05333	.08570	-.223	.116

Table above indicates that, there was no statistically significant difference between self-efficay mean scores of control and experimental group (t= -.62, df = 118, sig (2-tailed) = .535 > 0.05). So, there was no significant difference with regards to groups' self-efficay.

The Relationship between Self-efficacy and Vocabulary Learning

The relationship between EFL students' self -efficacy and their vocabulary learning was examined using Pearson product -moment correlation coefficient.

Table 6. Correlations Vocabulary Self-efficacy

		vocabulary	Self-efficacy
vocabulary	Pearson Correlation	1	.218
	Sig. (2-tailed)		.094
	N	60	60
Self-efficacy	Pearson Correlation	.218	1
	Sig. (2-tailed)	.094	
	N	60	60

Based on the results of the above table, the correlation between these two variables was r=.218 among participants which was not significant (sig=.094).

Discussion

Due to the importance of vocabulary knowledge in language learning, this research tried to shed light on employing CALL method in vocabulary learning besides probing into its relationship with self-efficacy. For this aim, 120 EFL learners participated in a vocabulary pre-test and answered self-efficacy survey. A number of 60 students received vocabulary instruction through CALL method. At the end of the mediation sessions, all the participants gave answer to vocabulary post-test and self-efficacy survey again.

The first research question was "Does technology use have any significant impact on Iranian EFL learners' vocabulary improvement?" the results indicated that using technology is an effective way to boost the EFL learners' vocabulary knowledge.

The findings lend support to previous studies, which confirmed the positive effect of using technology in vocabulary learning (Akhlaghi & Zareian, 2015; Bagheri, Roohani & Nejad Ansari, 2012; Jafari & Chalak, 2016; Hajebi, Taheri, Fahandezh, & Salari, 2018 Mousavi and Nemati, 2017). For instance, the obtained results was in line with the findings of Getkham' (2004) study, who found that multimedia materials has positive effect on second language learning, specially vocabulary learning. Besides, the findings are supported by Licenjacka and Filologia (2007). They also declared that CALL-based instruction lead to improvement of vocabulary knowledge among EFL learners.

The second research question was “Is there any significant relationship between Iranian EFL technology-supported vocabulary learning and their general self-efficacy?” based on the obtained results, there was no significant relationship between these two variables.

The finding was not the same as those of Mills et al. (2007), Onoda (2014), and Rimm-Kaufman and Sawyer (2004) who found that self- efficacy is a strong predictor of the achievement. They confirmed that there was a significant correlation between learners’ levels of self-efficacy and their learning vocabulary in technology supported settings.

Conclusions

The obtained results revealed that, using technology could assist EFL learners’ improving their vocabulary knowledge. Besides, no correlation was observed between the EFL learners’ use of technology in learning vocabulary and their general self-efficacy.

This study deals precisely with integration of technology in vocabulary learning to see whether it would have any impact on vocabulary knowledge of EFL learners. In other words, it reviewed the efficacy of CALL-based method on English vocabulary knowledge of EFL learners. Further, it probed into the relation between self-efficacy and language learning through CALL.

Vocabulary acquisition in learning a foreign language is a problematic and time-consuming task. Therefore, employing an appropriate and effective method for teaching and learning vocabulary is extremely vital. Technology application particularly CALL has recently encouraged some researchers to examine its influence on EFL learners’ vocabulary acquisition. The results confirmed that CALL users benefited from CALL and CALL-based method had the potential improvement of EFL Learners' English vocabulary knowledge.

In modern day education, technology is an indispensable part of education in general, and language learning, in specific. It facilitates teaching and learning, increases student engagement and participation, and the appropriate implementation of it enhances and elevates student achievement.

The development in English vocabulary knowledge through CALL underlines the vital role of CALL-based teaching of English vocabulary. Besides, the results indicate that the status of vocabulary teaching should alter and CALL-based teaching should be given more attention; also, CALL-based method can be used for improving English lexical competence; it should be mentioned that the competence of language teachers and the context of method application are important for employing CALL-based method.

The findings of the present study are of value to all those involved in teaching and learning English language as a foreign language and the educational system in general.

In addition to recognizing the influence of new technology, it has been suggested that technology courses may be required to be integrated into teacher preparation programs. Instructional technology cannot be treated as only part of a teacher preparation program, but must be ongoing in order to be successful. Since to a greater extent than ever before, EFL teachers in the present century are faced with the challenge of keeping updated, it is crucial for teacher educators and trainers to help teachers upgrade their skills by motivating them and removing informal workplace learning activities obstacles. The educational administrator should plan to raise the awareness of both teachers and learners about the benefits of CALL in education.

Based on the findings and conclusions of the current research, it seems necessary to replicate the present research. It could be replicated by sampling another group of EFL teachers or using teachers from other provinces. To generalize the findings on EFL learners, more classes with more numbers of EFL learners are needed.

It should be mentioned that this study used a survey where students were supposed to answer the questionnaire designed to measure their levels of self-efficacy. Self-efficacy is an internal attribute which is difficult to study exhaustively by means of some objective instruments. Moreover, the consideration of other demographic features in the future repetition of this study will result in more reliable and generalizable findings. The limited number of the participants can be a limitation. The study was limited to a sample of 120 EFL learners. It would have been more comprehensive if more learners were included in the sample.

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