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The Effects of the Instruction of Self-regulation Strategies and Critical Thinking Strategies on the Second Language Vocabulary Achievement among Iranian EFL Learners

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ABSTRACT

The present study was set to investigate the effects of the instruction of self-regulation strategies (SSs) and critical thinking strategies (CTSs) on the second language (L2) vocabulary achievement among Iranian English as a Foreign Language (EFL) learners. In so doing, ninety intermediate level adult female students in a language institute in Tehran were selected as the main participants of the study according to their performance on the Preliminary English Test (PET). The participants were divided into three equal and homogenized groups (i.e., one control group and two experimental groups). The learners in all groups underwent pretesting, intervention, and post testing. The experimental groups were provided with the instruction of self-regulation strategies and critical thinking strategies, whereas the control group did not receive any instruction in self-regulation or critical thinking strategies. The effects of the two experimental interventions on the L2 vocabulary achievement of the EFL learners were measured. Furthermore, the degree of the improvement of both of these strategies was also studied via comparing the students' achievement scores on pre- and post-tests of CTSs and SSs. Analyses of one-way ANOVA, post-hoc Scheffe's tests, and paired-samples t-tests were used to analyze the collected data. The results of data analyses revealed that applying critical thinking strategies as instructional aid had a significant impact on EFL learners' L2 vocabulary achievement. Likewise, the findings revealed that the instruction of self-regulation strategies significantly improved EFL learners' vocabulary achievement. Moreover, it was found that self-regulation strategies were more effective than critical thinking strategies in helping the EFL learners develop their L2 vocabulary.

Key words: Self-regulation Strategies, Critical Thinking, L2 Vocabulary, Iranian EFL Learners

INTRODUCTION

Vocabulary knowledge is a key component to successful use of fluent language and literacy skills (Nation, 1993). Developing rich vocabulary knowledge is of utmost importance for both L1 and L2 instruction. In second language learning breath of vocabulary can be taken as an indicator of how well the second language (L2) learners can perform academic language skills such as, reading, listening, and writing (Bear, Invernizzi, Templeton, &Johnston, 2008). Nation (2001) proposed four general goals which are of paramount importance in a language classroom. These learning goals include *language*, which embraces vocabulary; *Ideas*, which cover content and subject matter as well as cultural knowledge; *Skills*; and finally *discourse* (Nation, 2001). Besides, in learning a language, specifically for vocabulary goals, three aspects should be considered. These aspects include: the number of words in the language, the number of words known by the native speakers, and the number of words required for language production (Aloqaili, 2012). On the other hand, effective acquisition of second language vocabulary is specifically important for EFL learners who frequently acquire impoverished lexicons despite years of formal study (Hunt & Beglar, 2005). As previously mentioned vocabulary knowledge plays an undeniable role in the second and foreign language learning. Many scholars have tried to highlight the importance of vocabulary as an integral part of second language production. Consequently, an extensive body of study is now trying to show the substantial role of vocabulary in every aspect of second language learning. Gass and Selinker (2008) considered vocabulary as the most central language component that language learners should master. According to Breeze (2008), second language learners have tendency to utilize simple vocabulary with low lexical variation. In this way, they overuse the high frequency vocabulary but under-use academic vocabulary because these academic words are passive rather than being active in their memories. Iranian students are not exceptions in this regard and insufficient vocabulary knowledge remains a vital problem for most of the Iranian

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EFL students. One reason might be the use of inappropriate strategies for committing new vocabularies to memory. To see from another perspective, since most of the learners have difficulty in learning target words as part of the process of language, they need to develop strategies for overcoming vocabulary learning problems. Thus, the kind of strategy which may affect retention of the target words should be taken into account. It is worth mentioning that just teaching strategies may not guarantee that learners will apply them in learning but these strategies should be integrated to and become parts of learners' language learning process (Jun, 2012).

Undoubtedly, all second language learners and their teachers are virtually well aware of the fact that learning L2 includes the learning of large numbers of words (Laufer & Hulstijn, 2001), but how to accomplish this task is often of great concern to them. According to De La Fuente (2002), it is crucial to determine the most effective way of teaching vocabulary and to identify the most efficient means to promote effective acquisition of vocabulary.

One significant recently introduced variable helping the development of the second/foreign langue among the learners is self-regulation. Self-regulation concept was first derived from Bandura' (1986) social cognitive theory. Later, Zimmerman, Bonner, and Kovach (2006) tried to apply the concept to second language learning domain. There are several multidimensional definitions for self-regulation learning. Zimmerman & Bandura (1994 as cited in Amirian, Mallahi, & Zaghi, 2015) believe that self-regulation refers to "learners' self-generated ideas and actions which are systematically directed towards achieving educational goals and require learners' active participation in the learning process" (p.32). Zimmerman (2000) defined it as "self-generated thoughts, feelings and actions that are planned and cyclically adapted to the attainment of personal goals" (p. 14). Zimmerman (2002) posits that self-regulation is totally interrelated to self- efficacy, autonomy, and motivational beliefs such as attributions, intrinsic motivation, and goal orientation. On the other hand, Bandura (2000) states that self-regulation learning can contribute to cognitive development and functioning and operates as an important contributor to second language development and academic achievements. A great number of scholars also investigate the role of self-regulated learning in academic success (Chen, 2002; Van Den Hurk, 2006; Zimmerman & Campillo, 2003; Zimmerman, et al, 2006). According to Zimmerman (2000), self-regulation should be treated as an important aspect of language learning, largely including planning, monitoring, and self-evaluating. On the other hand, GU (2010) states that self-regulated learners are more goal-directed, active, and successful learners because they try to rely on themselves encountering any problem in language learning. Critical thinking has also become one of the current obsessions of general education since the middle of the 20th century. This mania has its ground, partly, in the fact that critical thinking necessitates the ability to reflect on a variety of issues: political, social, cultural as well as academic matters. It is with the help of critical thinking that one becomes capable of pondering upon his/her surroundings, evaluating and judging information in a meticulous manner and making momentous decisions.

Critical thinking is another significant factor affecting the second/foreign language development. Elder (2007) believes that the ability to think critically is an integral part of the human nature. In fact, critical thinking is regarded as one of the most crucial attributes. Paul and Elder (2009) view the concept of critical thinking as a set of intellectual standards that a person applies in order to think critically. In higher education, also, critical thinking has gained momentum. Socrates originally set the trend, when he asked his students to identify and resolve their incoherent and illogical thoughts to resolve disordered meanings, insufficient evidence, and incongruous assumptions. There is an extensive body of literature on the role of critical thinking in academic achievement. In a study on 83 female advanced EFL learners, Fahim, Bagherkazemi, and Alemi (2010) examined the role of the reading section in a standardized TOEFL test on engaging Critical thinking ability of the students. The result of this study demonstrated that those students with higher critical thinking ability manifested a statistically significant advantage. Moreover, the study necessitated the need for the integration of CT strategy training in EFL programs. In her investigation on the effectiveness of promoting learners' critical thinking and EFL skills in a content-based approach using the data obtained from learners' scores and their work samples, Liaw (2007) concluded that the learners improved both in terms of language learning and critical thinking during the application of the content-based syllabus. Frijsters, Dam, and Rijlaarsdam (2008) examined the effect of teaching value-loaded critical thinking within the subject of biology on 297 students in pre-vocational secondary school in Amsterdam developing two series of lessons, dialogic and non-dialogic. The result of their study revealed that students in dialogic learning group manifested a significant gain in their critical competence both in terms of reasoning and the quality of value orientation. Some ambiguity still exists about applying self-regulation strategies and critical thinking strategies for vocabulary learning. Thus, the present study aims to investigate the effects of employing self-regulation strategies and critical thinking strategies on the second language vocabulary achievement among Iranian EFL learners.

Given the significant role of vocabulary learning in L2 achievement, and also given the purported benefits of enhancing critical thinking and self-regulation as variables contributing to L2 development, few studies have been conducted to investigate the effects of the instruction of self-regulation strategies and critical thinking strategies on L2 vocabulary learning. And to the best knowledge of the present researchers, no study has ever investigated the comparative effects of the two types of instructional conditions (i.e. critical thinking strategy instruction versus self-regulation strategy instruction) on L2 vocabulary learning. As an attempt to shed more light on the L2 vocabulary learning in EFL contexts, this study was set to investigate the effects of teaching critical thinking and self-regulation strategies on L2 vocabulary learning. In addition, the differential effects of either of the two treatments were compared with each other.

RESEARCH QUESTIONS

To fulfill the purpose of this study and to consider the problems stated above, the following research questions were formulated:

1. Does critical thinking strategy instruction significantly affect second language vocabulary achievement of Iranian EFL learners?
2. Does self-regulation strategy instruction significantly affect second language vocabulary achievement of Iranian EFL learners?
3. Is there any statistically significant difference between the effects of the instruction of self-regulation strategies and critical thinking strategies on the second language vocabulary achievement among Iranian EFL learners?

METHOD

In an attempt to compare the effect of self-regulation strategies and critical thinking strategies on the second language vocabulary achievement among Iranian EFL learners, a detailed description of participants, instrumentation, procedure, design, and statistical analysis of the study would be of prime significance.

PARTICIPANTS

The participants of the study were ninety intermediate level female students with the age range 18 to 25 studying at Iran Mehr Language institute in Tehran. These participants were chosen from 120 intermediate students attending English conversation classes according to their performance in a sample Preliminary English Test (PET). Due to the nature of the convenient non-random sampling, the students who didn't meet the criterion were also allowed to participate in the study but their scores were not included in the related analyses of the study. The selected participants were assigned into two experimental groups, namely Self-Regulation Strategies Group (SRS) as the experimental group I and Critical Thinking Strategies Group (CTS) as the experimental group II, and one control group with 30 students in each, consisting of 12 to 18 students in each class.

INSTRUMENTATION

Preliminary English Test (PET)

The PET was used to homogenize students at intermediate level. This test was in four parts: the parts were reading (35 items), writing (7 items), listening (25 items), and speaking. The four parts of exam had the same value- 25% each. The total mark was made by adding all the results together. The administration of the whole test took 120 minutes. The rating scale that was used to rate the writing section of PET in this study was the one provided by Cambridge under the name *of General Mark Schemes for Writing*. The rating was done on the basis of the criteria stated in the rating scales including the rating scale of 0-5 for PET.

Vocabulary Knowledge Scale (VKS)

The second instrument used in this study to collect data was Paribakht and Wesche's Vocabulary Knowledge Scale (VKS). This test is usually used to assess the level of students' familiarity with vocabulary as it is a "practical instrument for use in studies of the initial recognition and use of new words" (Paribakht &Wesche, 1997, p. 175). In the present study, the students were required to choose from a 5-scale item for each word, which starts with no familiarity with that word at all and continues up to a total control over the word and being able to use it. This test was used at the beginning of the study to make sure students did not know the target words to be used in the research. Then those words which were new for at least 90% of the participants were selected as the main focus of the treatment and the target words for the development of the vocabulary pretest and posttest which was also piloted for the purpose of its reliability. This helped researcher find the target vocabularies to be focused on in the study as well as finding out the vocabulary knowledge of the learners.

Vocabulary Test (Pre and Posttests)

The third instrument to collect data in this study was a multiple-choice test of vocabulary which was used as the pre and posttests. To construct the test items, the researcher used the target words focused on in the study. This 20-item test was put to the scrutiny of two university professors of TEFL and then it was piloted before being administered. The test was piloted among 30 students with the same characteristics (age, gender, level) of the main participants of the test for the purpose of calculating its reliability and then it was modified. The vocabulary test comprised of 20 items was used as both pre and posttests in the present study to measure and compare the learners' vocabulary knowledge prior to the treatment and also as an immediate recall test of the vocabulary items after the treatment.

Procedure

The procedure of the present study was presented in three phases of pretesting, intervention, and post testing follows:

Pretest

The first step of the study was devoted to selecting the vocabulary items to be taught. One hundred and fifty words labeled as difficult words for the intermediate level in the course book of the students were extracted from the course book and a graded storybook appropriate for the intermediate level. Prior to the beginning of the study, the researcher administered the VKS test for the 150 words selected to find out how many of them were known to the students of the two experimental and one control groups. Out of these 150 words, 120 words that were unknown to 90 percent of the students taking part in the study were later used as target words and also to develop the vocabulary pretest and posttest. The second phase of this study was the pilot phase during which 30 intermediate students with similar features

to the target sample took all the assessment instruments comprising the sample PET used for homogenizing and a teacher-made multiple choice test of vocabulary which was used as pre and posttests. Item analysis was performed for all the items of the vocabulary test and the malfunctioning items with unacceptable facility and discrimination indices were removed. After carrying out item analysis the researcher came up with a reliable homogenizing test and a reliable and valid pre and posttest of vocabulary. In the third phase of this study, the participants were selected. First, the piloted PET was administered to 120 intermediate students to homogenize them regarding their general English proficiency. Out of 120 students, 90 students whose scores fell one standard deviation above and below the mean shaped the main participants of the study. The selected participants were non-randomly assigned to three groups; two experimental groups and one control group with 30 students in each.

Intervention

Then the treatment period began and continued for 16 sessions. The whole semester included ten weeks of which eight weeks were used of the present study experiment and the learners attended the classes two days a week, each session lasting for 90 minutes in all groups. Considering the fact that the syllabus of the language institute had to be covered during the semester, 30 minutes of each session were allocated to the experiment in the experimental groups. Therefore, the classes of control and experimental groups received the same hours of instruction and practice by the researcher herself.

Experimental group I

In the experimental group one, named Self-Regulation Strategies Group (SRS), the strategies were extracted from the books and articles available and then they were focused on in the vocabulary domain. Various strategies presented in SR domain supported reading comprehension skill and its related techniques and such strategies covered vocabulary as an essential reading part (Final, De Grado, &Inglesas, 2013). Such studies which have investigated the effects of teaching strategies have only mentioned that they used SRS such as planning, evaluating, obtaining and using resources, reasoning, generating. But these studies do not provide clear strategies covering the vocabulary domain. However, one of the most comprehensive SRS in this regard has been developed by Wang (2004). Table 1 below represents Wang's list and description of SRS which could be used to help learners improve their second language vocabulary knowledge.

The learners in this group were briefed about the strategies gradually and they practiced them in an accumulated form throughout the semester. It means that the learners were asked to focus on the items given in the table 3.1 above every session. This way they gained more ability in using the strategies labeled as Self-regulated language strategies. Each session about 10 target words were introduced to the classroom through the reading texts, exercises in the book and other media such as films, listening sections of the books and the like. The learners then were encouraged to follow the strategies labeled as SRS both in the classroom and outside the classroom while they were home doing their homework.

Table 1. Self-regulated language strategies developed by Wang (2004)

Category definitions	**Examples within the English language learners sample**
1. Self-evaluation: Self-initiated evaluations of the quality or progress of students' work.	Check the writing before returning it in to the teacher.
2. Organizing and transforming: Self-initiated overt or covert rearrangement of instructional materials to improve learning.	Translate English into their native language to help memorize the word.
3. Goal setting and planning: Setting educational goals or sub goals and planning for sequencing, timing, and completing activities related to the self-set goals.	Adjust what to write in a journal entry by checking how much time is left.
4. Seeking information: Self-initiated efforts to secure further task information from non-social sources.	Look for the meaning of a word in a dictionary.
5. Keeping records and monitoring: Self-initiated efforts to record events or results.	Take down an unknown word to ask for help later.
6. Environmental structuring: Self-initiated efforts to select or arrange the physical setting to make learning easier.	Study a new vocabulary in one's own room.
7. Self-consequences: Student arrangement or imagination of rewards or punishment for success or failure.	Jump up and down when one gets good results of study.
8. Attentional control: Self-initiated performance of a particular personal behavior to improve learning.	Listen carefully in class.
9. Rehearsing and memorizing: Self-initiated efforts to memorize learning materials by overt or covert practice.	Write the word many times on paper in order to memorize it.
10. Seeking assistance: Self-initiated efforts to solicit help from adults, teachers, or peers.	Ask the teacher for help.
11. Reviewing records: Self-initiated efforts to reread notes, tests, or textbooks.	Reread the textbook and glossary before a test.

They were also asked to practice the strategies in the classroom and the teacher provided them with the required feedback.

Experimental group II

In the experimental group two, which was named Critical Thinking Strategies Group (CTS), some of the CT strategies already worked out were used to teach vocabularies. The main CT strategies referred to in the literature were previewing, contextualizing, questioning, reflecting, outlining and summarizing, evaluating an argument, and comparing and contrasting (Klenz, 1987, as cited in Lovelace, 2005). In some other studies, the main focus has been on interpretation, analysis, evaluation, inference, explanation, self-regulation as well as explanation of the evidential, conceptual, methodological, criteriological, and contextual consideration upon which one can reach this judgment (Rahimi & Soryani, 2014). The most frequently cited taxonomy in this regard is the one presented by Kizlik (2011). He has focused on Critical Thinking (CT) skills taxonomy as presented in Table 2 below. These skills could be employed as strategies to learn vocabularies in the CT- oriented activities.

The strategies were explained to the students in this group and the sheet of strategies was provided for them. The learners were encouraged to use the macro and micro strategies of critical thinking mentioned in the table 2 above to read texts and learn vocabularies. For example a text was introduced to the classroom and the learners were asked to first focus on the meaning of the text and its grammatical points. Then they were asked to think of the purpose of the text and what it intended to imply. In the next step the learners were asked to focus on the ethical value of the content of the text and the impact it can have on the learners' mentality and thoughts. To ignite the learners' creativity, the teacher asked them to criticize the points mentioned in the text and then she asked the students to discuss the points in the classroom. The learners were supposed to present a summary of the text and in some cases they were asked to elaborate on the text and its content and present their own ideas which could be in line with what the text was offering or rejected the idea presented through reasoning.

Control group

In the control group the conventional and course book oriented instruction of vocabularies were followed. As the main course book used was *Touch Stone Series*, the control group mainly enjoyed a task-based method which was the governing theme in the series. It is worth mentioning that the learners in this group did not receive instructions in terms of cortical thinking or self-regulation strategies.

Table 2. Kizlik's (2011) Critical Thinking Skills Taxonomy

FOCUSING SKILLS - attending to selected pieces of information and ignoring others.
1. Defining problems: clarifying needs, discrepancies, or puzzling situations.
2. Setting goals: establishing direction and purpose.
INFORMATION GATHERING SKILLS - bringing to consciousness the relative data needed for cognitive processing.
3. Observing: obtaining information through one or more senses.
4. Formulating questions: seeing new information through inquiry.
REMEMBERING SKILLS - storing and retrieving information.
5. Encoding: storing information in long-term memory.
6. Recalling: retrieving information from long-term memory.
ORGANIZING SKILLS - arranging information so it can be used more effectively.
7. Comparing: noting similarities and differences between or among entities.
8. Classifying: grouping and labeling entities on the basis of their attributes.
9. Ordering: sequencing entities according to a giver criterion.
10. Representing: changing the form, but not the substance of information.
ANALYZING SKILLS - clarifying existing information by examining parts and relationships.
11. Identifying attributes and components: determining characteristics or the parts of something.
12. Identifying relationships and patterns: recognizing ways elements are related.
13. Identifying main ideas: identifying the central element; for example the hierarchy of key ideas in a message or line of reasoning.
14. Identifying errors: recognizing logical fallacies and other mistakes and, where possible, correcting them.
GENERATING SKILLS - producing new information, meaning or ideas.
15. Inferring: going beyond available information to identify what may reasonably be true.
16. Predicting: anticipating next events, or the outcome of a situation.
17. Elaborating: explaining by adding details, examples, or other relevant information.
INTEGRATING SKILLS - connecting and combining information.
18. Summarizing: combining information efficiently into a cohesive statement.
19. Restructuring: changing existing knowledge structures to incorporate new information.
EVALUATING SKILLS - assessing the reasonableness and quality of ideas.
20. Establishing criteria: setting standards for making judgments.
21. Verifying: confirming the accuracy of claims.

Posttest

After eight weeks of instruction in 16 sessions, all the target words were covered and the researcher administered the validated posttest to measure the knowledge of the students about the taught words and self-regulation and critical thinking strategies. Hopefully, the researcher herself had taught all classes to control the possible effect of different teachers on students' learning. After the treatment all the students in the three groups received the posttest of vocabulary.

RESULTS

A one-way analysis of variances (ANOVA) was run to compare the Self-Regulation Strategies Group (SRS), Critical Thinking Strategies Group (CTS), and control groups' means on the posttest of collocations in order to probe research questions raised in this study.

Before discussing the results, it should be mentioned that the assumption of homogeneity of variances was met (Levene's F (2, 87) = 1.15, p =.321) (Table 3).

As displayed in Table 4 the self-regulation group (M = 23.60, SD = 3.62, 95 % CI [22.25, 24.95]) had the highest mean on the posttest of vocabulary. This was followed by critical thinking group (M = 20.97, SD = 4.36, 95 % CI [19.34, 22.60]) and the control group (M = 17.50, SD = 3.40, 95 % CI [16.23, 18.77]).

Based on the results displayed in Table 5 (F (2, 87) = 19.24, p =.000, ω2 =.28, representing a large effect size), it was concluded that there were significant differences between the means of the three groups on the posttest of vocabulary.

The results of the post-hoc Scheffe's tests (Table 6) indicated that;

1. The critical thinking group (M = 20.97) significantly outperformed the control group (M = 17.50) on the posttest of vocabulary (MD = 3.46, p =.003, 95 % CI [1.01, 5.92]). Thus, the first null-hypothesis as "critical thinking strategies do not significantly affect second language vocabulary achievement among Iranian EFL learners", was rejected. Therefore, applying critical thinking strategies as instructional aid had a significant impact on EFL learners' achievement of second language vocabulary.
2. The self-regulation group (M = 23.60) significantly outperformed the control group (M = 17.50) on the posttest of vocabulary (MD = 6.10, p =.000, 95 % CI [3.64, 8.56]). Thus, the second null-hypothesis as "self-regulation strategies do not significantly affect second language vocabulary achievement among Iranian EFL learners" was rejected. Thus, applying self-regulation strategies as instructional aid had a significant impact on EFL learners' vocabulary achievement.
3. The self-regulation group (M = 23.60) significantly outperformed the critical thinking group (M = 20.97) on the posttest of vocabulary (MD = 2.63, p =.033, 95 % CI [.18, 5.09]). Thus, the third null-hypothesis as "there is no statistically significant difference between the effect of self-regulation strategies and critical thinking strategies on the second language vocabulary achievement among Iranian EFL learners" was rejected. Although, the results should be interpreted cautiously due to the wide gap between the lower and upper 95 percent confidence intervals.

Table 3. Levene's test of equality of error variances

F	df1	df2	Sig.
1.151	2	87	0.321

Criterion Referenced Validity

The Pearson correlations between the pretest and posttest of vocabulary and the PET test were used as the criterion referenced validity for the vocabulary tests. Based on the results

Table 4. Descriptive statistics; posttest of vocabulary

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Control group	30	17.50	3.401	0.621	16.23	18.77
Critical Thinking	30	20.97	4.367	0.797	19.34	22.60
Self-regulation	30	23.60	3.626	0.662	22.25	24.95
Total	90	20.69	4.536	0.478	19.74	21.64

Table 5. One-way ANOVA; posttest of vocabulary by groups

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	561.622	2	280.811	19.242	0.000
Within Groups	1269.667	87	14.594		
Total	1831.289	89			

Table 6. Multiple comparisons; posttest of vocabulary

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Critical Thinking St	Control	3.467*	0.986	0.003	1.01	5.92
Self-regulation	Control	6.100*	0.986	0.000	3.64	8.56
	Critical Thinking St	2.633*	0.986	0.033	0.18	5.09

*. The mean difference is significant at the 0.05 level

displayed in Table 7 both pretest (r (88) =.66, p =.000, representing a large effect size) and posttest (r (88) =.83, p =.000, representing a large effect size) of vocabulary enjoyed criterion validity.

Reliability Indices

The KR-21 reliability indices for the vocabulary pretest, vocabulary posttest, and PET were calculated and reported as observed in Table 8 below.

DISCUSSION

The purpose of the present study was to investigate the effects of the instruction of self-regulation strategies (SSs) and critical thinking strategies (CTSs) on the second language (L2) vocabulary achievement among Iranian English as a Foreign Language (EFL) learners. The findings of the present study revealed that the employment of critical thinking strategies as instructional aid had a significant impact on EFL learners' achievement of L2 vocabulary. Furthermore, the findings indicated that the instruction of self-regulation strategies significantly contributed to the development of EFL learners' vocabulary achievement. Additionally, it was found that teaching self-regulation strategies was more effective than teaching critical thinking strategies in helping the EFL learners develop their L2 vocabulary.

All of these findings are in line with the previously reported pieces of research in the literature. The first finding of the study indicated the significant role self-regulation strategies play in the vocabulary development of the EFL learners. This is in line with what Boeakaerts, et al. (2000) asserted in terms of the incomparable effects of self-regulation and autonomy in the improvement of learners' second language. Zimmerman's (2000) study concerning the social cognitive impacts of attaining self-regulation on the second language development of the learners also highlighted the significance of self-regulation strategies and their role in ESL development. The present study also supports Gu's (2010) research in the EFL context in which the strategic self-regulation proved to be one of the main factors in teaching and researching language learning strategies. Moreover Zahidi's (2012) study in the Malaysian context proved that self-regulation plays a pivotal role in English language learning. Sánchez Luján (2013) also found that among learning strategies, self-regulation highly affects in vocabulary acquisition. Finally, the present study finding is in line with Seker's (2015) study which proved that using self-regulation strategies by foreign language learners leads to their EFL achievement.

The second finding of the study asserted the positive role of critical thinking in the EFL learners'' vocabulary achievement. This is in line with Bailin, et al.'s (1999) study which proved that through conceptualizing critical thinking, the SL learners can enlarge their vocabulary development as well as their diction ability. In addition to their effect on second language vocabulary achievement, critical thinking strategies have proved to positively affect SL reading and writing (Bazrafkan & Bagheri, 2014) in the EFL context. They have also helped the EFL learners enhance their listening comprehension (Willingham, 2007). Johnson, Archibald, and Tenenbaum (2010) also found that critical thinking could affect individual and team annotation and meta-cognitive skills. Fahim, et al. (2010) also confirmed that the test taker's critical thinking ability and their performance on the reading section of TOEFL highly correlated. This means that critical thinking strategies highly affect the EFL learners' development. This has been confirmed by many researchers (Aloqaili, 2012; Fahim & Behdani, 2011; Hove, 2011; Sa-ngiamwibool, 2011) in EFL context.

Some recent research including Allahverdi Purfallah and Gholami (2014), Rahimi and Soryani (2014) and Bazrafkan and Bagheri (2014) have studied the effects of raising Iranian EFL learners' critical thinking on vocabulary learning and found a highly positive effect in this regard. Though the present study proved that self-regulation strategies were more useful than critical thinking strategies in helping the EFL learners achieve English vocabularies, Fahim and Haghighi' s (2014) study which focused on the relationship between critical thinking ability of Iranian EFL learners and their academic self-regulation found that critical thinking can highly predict self-regulation of the learners. The study proved high correlation between the two. The present study also showed that awareness towards both of these strategies could be increased among the learners through instructions. This is also supportive of Ghanizadeh and Mirzaei's (2012) study which proved that EFL learners' self-regulation highly correlates with their critical thinking and language achievement. They also found that self-regulation strategies could predict critical thinking and language achievement of the learners. Gibby (2013) discussed that critical thinking skill in adult EFL learners could be increased through practicing. Therefore it can be stated that both critical thinking strategies and self-regulation strategies could help the learners achieve English vocabularies highly well. Also these strategies could be better used through training.

Table 7. Pearson correlations; pretest and posttest of vocabulary with pet

	PET
Pretest	
Pearson Correlation	0.660**
Sig. (2-tailed)	0.000
N	90
Posttest	
Pearson Correlation	0.833**
Sig. (2-tailed)	0.000
N	90

**. Correlation is significant at the 0.01 level (2-tailed)

Table 8. Kr-21 reliability indices

	N/P	N of Items	Mean	Variance	KR-21
PET	90	60	33.63	35.403	0.94
Pretest	60	20	16.70	11.808	0.64
Posttest	60	20	20.69	20.576	0.76

CONCLUSION

Overall, the findings of the present study verified that the instruction of critical thinking strategies significantly improved EFL learners' achievement of second language vocabulary. Pintrich's (2000) study confirmed Zimmerman's in terms of the positive role of being self-regulated and goal orientated in self-regulated learning. Shell and Husman's (2008) study also confirmed the positive role of control, motivation, affect, and strategic self-regulation in the college classroom. Bailin (2002) signified the importance of critical thinking in the educational context and clarified that through employing CT principles the ESL learners could improve their own language ability and thought.

Also, the findings revealed that the instruction of self-regulation strategies had a significant impact on EFL learners' vocabulary achievement. It was also found that self-regulation strategies were more effective than critical thinking strategies in helping the EFL learners develop their second language vocabulary; some other researchers such as Fahim and Zaker (2014) indicated that EFL learners' creativity can be enhanced through critical thinking, not self-regulation strategies. Mall-Amiri and Ahmadi (2014) also proved the positive relationship between EFL learners' critical thinking and metacognitive strategies, which in their own turn affect one's general language development. Johnson, et al. (2010) also found that critical thinking could affect individual and team annotation and meta-cognitive skills.

According to the literature on self-regulation strategies, critical thinking strategies and their effect on the second language vocabulary achievement among Iranian EFL Learners (Allahverdi Purfallah & Gholami, 2014; Bazrafkan & Bagheri, 2014; Fahim & Behdani, 2011; Fahim & Haghighi, 2014; Fahim & Zaker, 2014; Ghanizadeh & Mirzaei, 2012;Mall-Amiri &Ahmadi, 2014; Rahimi & Soryani, 2014; Shabani & Mohammadian, 2014), employing SRSs and CTSs and their related techniques could promote second language development in general, and second language learners' knowledge of vocabularies, in particular.

Pedagogical Implications

The present study demonstrated that employing CTSs and SRSs can influence the EFL learners' SL vocabulary development. EFL learners need to know native like lexical items, idioms, expressions, vocabularies, phrasal verbs, grammatical points, preferences, dictions, and the like for a native like performance. Therefore, according to the results of the present study, some implications for teaching and learning of SL vocabulary through employing CTSs and SRSs and their tasks can be suggested. The positive impact of CTSs and SRSs in the ESL/EFL classrooms paves the way for providing an atmosphere in which learners improve their second language skills eagerly in a cooperative mode (Ghanizadeh & Mirzaei, 2012). Employing user-friendly tasks aiming at facilitating the retention of SL vocabularies through CTSs and SRSs is very likely to be effective (Bazrafkan & Bagheri, 2014).

CTSs and SRSs and their related tasks could be employed by second language teachers to make the learners more aware of what they are dealing with in the world of classroom. The assumption is that CTSs and SRSs can facilitate learning (Bazrafkan & Bagheri, 2014), and learners enjoy a cooperative mode in the language classroom and pay attention to their peer's development. This way cooperation and collaboration will be energized and competition will be minimized. This way the learners combine the class room discussions and develop an acceptable level of second language vocabularies (Fahim & Behdani, 2011).

English teachers and learners could employ CTSs and SRSs in their classes to facilitate learning. This way the classroom interactions could be enriched and would help subsequent L2 development of the learners. Materials developers in the ELT domain also could employ the findings of the present study and those of the similar ones to present tasks in which learners' awareness toward learning is enhanced. Such tasks may help the learners move towards cooperative learning, peer and self-evaluation, cognitive learning, cultural literacy, and meaningful learning.

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