The Effect of Self-Directed Learning on Critical Thinking of Iranian EFL Learners

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Abstract: *The crucial role of self-directed learning in L2 learning has been widely recognized. However, finding an effective method to teach self-directed learning has always been a matter of debate among teachers and practitioners. This study aimed at investigating the effect of self-directed learning on critical thinking of Iranian intermediate EFL learners. To this end, after the administration of a proficiency test, 60 female undergraduate participants were selected and then randomly assigned to the two homogeneous control and experimental groups. The validated researcher-made questionnaire was employed as the pre-test. Then, a learning package including materials about self-directed learning was presented to the experimental group. Afterwards, this questionnaire was used again as the post-test. Lastly, in order to determine the effect of self-directed learning on critical thinking in the long run, a delayed post-test was administered. The computerized statistical analysis of the results revealed that teaching self-directed learning led to the enhancement of the participants critical thinking. Implications of the findings are discussed for Language teachers, learners, and curriculum developers.*

Key Words: *Critical Thinking; EFL Learners; EFL Learning; Self-Directed Learning;*

1. Introduction

Needless to say, there are numerous approaches to learning the language. One Is critical thinking that is viewed as a mental habit promoting reflection, and is an examination of ideas in terms of pieces of evidence. Critical thinking must be strongly valued as a key to educational success. Critical thinkers apply logic to solve problems and make decisions. Teachers should challenge learners to think critically about course concepts. There are manifold strategies to develop critical thinking. One strategy is self-directed learning and the current study seeks to explore the effect of self-directed learning on critical thinking.

Self-directed learning (SDL) is a type of self-planned, self-initiated, and autonomous learning that has its roots in adult education and is principally derived from the humanistic psychology and regards learners as responsible directors of their own learning experiences. SDL is materialized when learners direct, and regulate their own learning process and experience self-actualization through deciding on the materials, methods, and goals of learning. Manifestly, learning does not necessarily occur in formal, educational settings because learners can learn all by themselves in informal settings. Taking a great deal of initiative in their own learning, learners can choose learning strategies independently of their teachers. To have a developed self, it is highly recommended that learners manage their own learning process through engagement in SDL.

Costa and Kallick (2004) stated that employing product-oriented methods of measurement cannot evaluate the process-oriented goals, like the learner's capacity to grow more self-apprasive and self-directed. Accordingly, it is recommended that the current assessment model switch to the one that paves the way for a

more sensible procedure that embraces classroom-oriented evaluations supplementing state-oriented evaluations. Real-life and alternate forms of evaluation are requisites for appraising learner progress toward self-directedness. Taking cognizance of the designated consequences of learning and learning about their growth during the learning process can considerably raise learners level of self-direction. Generating a product or performance allows real-life and alternate forms of evaluation to help learners show their utilization and comprehension of knowledge.

   Azer (2008) claimed that self-directed learning is an adult learning process that makes use of feedback to fulfill the detected learning needs. This brings about learner's intended use of a fund of learning resources to overwhelm the inadequacy of knowledge, skills, or professional improvements. Efficacious time management, self-evaluation skills, and critical appraisal skills are requisites of operative self-directed learning. Self-directed learning inspires learners to frame their attitudes by scrutinizing feedback, getting results, comparing viewpoints, and posing questions.

2.   Review of Literature

2.1. Self-Directed Learning

Costa and Kallick (2004) stated that a self-directed person can be described as being Self-Managing: Feeling disposed to be engaged in activities with awareness of the results, their weight, and essential information, and subsequently making use of prior experiences, looking forward to signs of achievement, and generating substitutes for attainment Self-Monitoring: Having adequate self-recognition about what is effective, employing conscious metacognitive strategies to assess the effectiveness of the strategic plan, and to help in the decision-making processes of changing the plan and selecting the appropriate tasks and techniques Self-Modifying: Scrutinizing, pondering over, assessing, and constructing meaning from experience and utilizing their knowledge to future activities, tasks, and activities.

   According to Azer (2008) characteristics of self-directed learners are as follows:

- They are inclined to consider various facets that pertain to a novel notion
- draw upon separate resources to glean data
- can recall their postgraduate experiences
- don't have to be confined to one special resource
- can recall prior knowledge
- can give good reasons for their opinions and cope with ambiguity think
- they can take control of their own learning process
- are eager for their learning attainments
- utilize techniques to determine the objectives of learning
- apply an hypothesis-driven approach to their learning
- can discuss various opinions
- can make use of feedback acquired in other positions
- choose learning materials

In a study, Sheckley (1985) observed that 56 percent of the learning projects in which community college students were involved in an average of seven learning projects were self-directed. Each learning project took 285 hours. Likewise, Leean's (1981) study demonstrated that 98 percent of rural high school learners learning effort included self-planning. It seems that the findings of these studies show that adult learners' involvement in self-directed learning is not considerably affected by learners' level of education. Results of these studies are analogous with the research by Brockett, (1983), Herbeson, (1991), and Spear, (1984).

Different studies demonstrate that learners participate in learning projects on a large scale. For instance, Sargant's (1991) study showed that one in six adult learners is willing to shift to informal type of learning wherever they want to embark on learning (1991, p. 15). In conclusion, it is clear that there are a very large number of individuals who assume responsibility for their own learning with great enthusiasm in order to become self-planned, self-directed learners.

2.2 Critical Thinking

Moon (2008) stated that professional education is taken into consideration as a must for thinking critically about an occurrence generally, and is probably labeled as 'critical reflection'. Thinking critically about an occurrence probably necessitates scrutinizing an occurrence in which the thinker has been engaged and the goal will be to assess his or her action and take different ways of managing an occurrence. Consequently, it is likely to accord with   the self-based notion of critical thinking. The ' occurrence ' may be a situation that has not entailed the thinker's direct engagement, but typically what is significant is practice with regard to the occurrence.

Jackson, Ignatavicius, and Case (2006) mentioned that in spite of the fact that there are techniques that are used as shortcuts with different levels of achievement, in fact there is no agreeable shortcut to critical thinking. Employing heuristics is one of the favorite techniques. For instance, the principal can utilize the availability heuristic technique (that uses the most promptly available data to judge) to write the yearly assessment of the teachers. This technique typically draws on the latest data. Therefore, if a teacher's attitude has been positive three weeks ago, this will be considered as his performance assessment. Since the principal has not considered the problems the teacher had with some of the students two months ago, the teacher is satisfied with the performance assessment.

Numerous university teachers view critical thinking as leading sign of student learning quality. In its 2005 national report, the Association of American Colleges and Universities (AACU) elucidated that 93% of higher education faculty considered analytical and critical thinking to be a fundamental learning end result (AACU, 2005), while 87% of undergraduate students showed that college experiences enabled them to make use of innovative and analytical thinking. According to this AACU report showed that only 6% of undergraduate seniors indicated critical thinking competence in terms of Educational Testing Services standardized evaluations from 2003 to 2004. During the same time period, information from the ACT Collegiate Assessment of Academic Proficiency test indicated a similar course, with undergraduates promoting their critical thinking less than 1 SD from freshman to senior year. Therefore, it seems that a distinction exists between professors' attitudes towards critical thinking and students' potential to show and recognize critical thinking competence through standardized evaluations (AACU, 2005).

In a study, Quitadamo*, and Kurtz (2007) divided biology students into writing, and nonwriting groups. Writing students showed greater gains in analysis, inference, and evaluation skills (three critical thinking skills). Writing significantly affected critical thinking performance, whereas other covariables such as gender, ethnicity, and age did not significantly affect critical thinking performance. The writing group had statistically significant rises in inference and analysis skills, while the nonwriting group did not. Neither of the groups had statistically significant rises in the evaluation skill. Findings demonstrated that the writing group students significantly surpassed the nonwriting students in the component critical thinking skills of inference and analysis. This study demonstrated that writing promotes student critical thinking skills.

3. Statement of the Problem

Iranian EFL learners are not adequately acquainted with the notion of critical thinking. Typically, they accept numerous ideas without making any attempt to judge them in terms of truthful pieces of evidence.

Consequently, critical thinking should be taken into account to teach learners how to challenge various viewpoints.

Therefore, the specific problem under investigation in this study is to identify some characteristics of successful critical thinkers. It has also been attempted to encourage educators to take critical thinking into account in their course development efforts.

Little is known about self-directed learning. In fact, much of the development of the non-traditional education (SDL) depends on this notion that learners have a strong desire for non-traditional learning that has nothing to do with traditional (teacher-oriented) learning used by traditional higher education schools and institutions. Very little is known about characteristics of a successful self-directed learner.

4. Research Questions

Due to the importance of self-directed learning and its probable effect on critical thinking, the following questions have been posed:
1. Does self-directed learning lead to the enhancement of Iranian intermediate EFL learners critical thinking?
2. Will the effect of self-directed learning on Iranian EFL learners critical thinking be retained over time?

5. Research Hypotheses

1. Self-directed Learning does not lead to Iranian intermediate EFL learners critical thinking.
2. The effect of Self-directed Learning on critical thinking of Iranian intermediate EFL learners will not be retained over time.

6. Method

6.1. Participants

Participants of this study were 60 female undergraduate students of two Iranian universities majoring in English teaching. It's worth mentioning that they were homogenized based on the results of a proficiency test used to measure the level of the participants proficiency. Indeed, they were selected from among 80 juniors, and randomly assigned to the two equal experimental and control groups of 30. All students were female, and their age ranged from 21 to 30.

6.2. Instrumentation

In this study, one questionnaire was used as the main instrument. This questionnaire was a researcher-made questionnaire which has been considered as the critical thinking readiness scale. It included 29 questions. With regard to the reliability of the questionnaire, it has been found in a pilot study that the Cronbach's alpha coefficient was 0.83. To make sure that the questionnaire is valid, expert opinions were taken into consideration.

6.3. Data Collection Procedure

Participants were randomly assigned to the control and experimental groups. The researcher-made questionnaire was used as the pre-test for the purpose of measuring the participants level of criticalness. Then, a learning package including materials about self-directed learning was taught to the experimental group. Afterwards, the questionnaire was used again as the post-test for the purpose of measuring the possible effects of self-directed learning on participants critical thinking two weeks later. Lastly, in order to

determine the effect of self-directed learning on critical thinking in the long run, a delayed post-test was administered two weeks later. All the data was on the computer and analyzed by SPSS.

The learning package includes materials about self-directed learning. It involves Azer's (2008) characteristics of self-directed learners, including discussing different ideas, selecting learning materials, providing good reasons for their viewpoints, taking control of their own learning process, remembering their postgraduate experiences, considering different aspects that pertain to a new notion, using more than one resource, remembering prior knowledge, drawing upon separate resources to collect feedback. The goal of this part was to make learners self-directed individuals by encouraging them to take control of their own learning process. The learning package is orally taught to the participants by providing them with examples, definitions, and characteristics of self-directed learning.

7. Findings

To answer the first research question of the study, initially an Oxford placement test was used to measure the level of the participants proficiency, and the descriptive statistics were calculated. Afterwards, repeated-measures ANOVA was used to analyze the effect of self-directed learning on critical thinking of the participants of the study during the pretest, posttest, and delayed posttest. Lastly, a post hoc test (Bonferroni) was used to compare each group with the other ones. The results of the Oxford placement test are as follows: t is -.378 and df is 58. Levene's test's significance level for equality of variances is .785 in the two groups (P= .785). Accordingly, there is no significant difference between the two groups (i.e. the two groups are homogeneous).

In the control group, the means of the pretest, posttest, and delayed posttest were 96.166, 99.933, and 1.0253E2 respectively. In the experimental group, the means of the pretest, posttest, and delayed posttest were 98.933, 1.0703E2, and 1.1000E2 respectively. Therefore, the increase of means shows the increase of critical thinking in both control and experimental groups from one test to another one, but this increase has been more tangible in the experimental group. In the control group, the standard deviations of the pretest, posttest, and delayed posttest were 14.994, 15.900, and 15.956 respectively. In the experimental group, the standard deviations of the pretest, posttest, and delayed posttest were 14.27545, 14.52817, and 14.18353 respectively.

The current study clarifies the possible effect of self-directed learning on Iranian EFL learners critical thinking over time. It also clarifies whether there has been any significant change between the participants amount of critical thinking of the experimental and control groups as well.

According to Table 1, the p value for the three tests (the pretest, posttest, and delayed posttest) is 0. It means that the results of the three tests have not been the same ($F (1.566, 90.820) = 170.274$, $p < .001$). Thus, in other words, the amount of critical thinking in the three tests has been different.

Table1. Tests of comparison of the amount of critical thinking among the pretest, posttest, and delayed posttest

Source		Type III Sum of Squares	Df	Mean Square	F	Sig.
Trial (the pretest, posttest, and delayed posttest)	Sphericity Assumed	2378.633	2	1189.317	170.247	.000
	Greenhouse-Geisser	2378.633	1.566	1519.056	170.247	.000
	Huynh-Feldt	2378.633	1.629	1459.854	170.247	.000
	Lower-bound	2378.633	1.000	2378.633	170.247	.000
trial * group	Sphericity Assumed	205.011	2	102.506	14.673	.000
	Greenhouse-Geisser	205.011	1.566	130.925	14.673	.000

	Huynh-Feldt	205.011	1.629	125.823	14.673	.000
	Lower-bound	205.011	1.000	205.011	14.673	.000
Error(trial)	Sphericity Assumed	810.356	116	6.986		
	Greenhouse-Geisser	810.356	90.820	8.923		
	Huynh-Feldt	810.356	94.503	8.575		
	Lower-bound	810.356	58.000	13.972		

Table 1 shows that the effect of time on critical thinking is significant (i.e. critical thinking has increased from one test to another one).

As it can be seen in Table 1, the means, because of the effect of time, from pretest to posttest are increasing in a somewhat linear way. Accordingly, we are witnessing a statistically significant linear trend for these means in Table 2.

Table2. Tests of comparison of the amount of critical thinking among the pretest, posttest, and delayed posttest

Source	Trial	Type III Sum of Squares	Df	Mean Square	F	Sig.
Trial	Pretests vs. delayed posttests	4558.817	1	4558.817	225.447	.000
	posttests vs. delayed posttests	464.817	1	464.817	62.095	.000
	Pretests vs. posttests	2112.267	1	2112.267	148.667	.000

Table 2 demonstrates that the difference between the mean scores, from one test to another, is significant, and critical thinking has been changed from one test to another one.

In order to determine the amount of critical thinking in experimental and control groups, an ANOVA was performed, whose results are presented in table 3:

Table 3. Tests of comparison of the amount of critical thinking in experimental and control groups

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Intercept	1888665.800	1	1888665.800	2.861E3	.000
Group	1502.222	1	1502.222	2.276	.137
Error	38289.978	58	660.172		

Table 3 compares the amount of critical thinking in experimental and control groups. It can be concluded from this table that there is no significant difference between the scores of the two groups in the pretest, posttest, and delayed posttest. (p=.137)In other words, there has been no considerable difference between the control and experimental groups in terms of amount of critical thinking.

Table 3 elucidates that the effect of self-directed learning on critical thinking is not significant (i.e. there is no difference between the two groups amount of critical thinking during the pretest, posttest, and delayed posttest).

In order to determine the location of the difference, a post hoc test (Bonferroni) was applied, whose results are presented in the following table.
Table 4 is a post hoc test (Bonferroni) that was used to compare each group with the other ones.

Table 4.The results of the post hoc (Bonferroni) test

Group	(I) trial	(J) trial	Mean Difference (I-J)	Std. Error	Sig.a	95% Confidence Interval for Differencea	
						Lower Bound	Upper Bound
Control	Pretest	Posttest	-3.767*	.533	.000	-5.122	-2.412
		Delayed posttest	-6.367*	.660	.000	-8.044	-4.690
	Posttest	Pretest	3.767*	.533	.000	2.412	5.122
		Delayed posttest	-2.600*	.358	.000	-3.508	-1.692
	Delayed posttest	Pretest	6.367*	.660	.000	4.690	8.044
		Posttest	2.600*	.358	.000	1.692	3.508
Experi mental	Pretest	Posttest	-8.100*	.814	.000	-10.169	-6.031
		Delayed posttest	-11.067*	.955	.000	-13.494	-8.639
	Posttest	Pretest	8.100*	.814	.000	6.031	10.169
		Delayed posttest	-2.967*	.609	.000	-4.515	-1.419
	Delayed posttest	Pretest	11.067*	.955	.000	8.639	13.494
		Posttest	2.967*	.609	.000	1.419	4.515
Based on estimated marginal means							
*. The mean difference is significant at the .05 level.							
a. Adjustment for multiple comparisons: Bonferroni.							

In either group, significant differences between the mean scores in the two tests have been shown by an asterisk. In either group, there were significant differences between the mean scores of the pretest, and posttest, and between the mean scores of the posttest, and delayed posttest, and between the mean scores of the pretest, and delayed posttest in the sense that the amount of critical thinking has varied from one test to another one.

Table 5. The results of the post hoc (Bonferroni) test							
Dependent Variable	(I) group	(J) group	Mean Difference (I-J)	Std. Error	Sig.a	95% Confidence Interval for Differencea	
						Lower Bound	Upper Bound
Pretest	control	Experi mental	-2.767	3.780	.467	-10.333	4.800
	Experi mental	control	2.767	3.780	.467	-4.800	10.333
Posttest	control	Experi mental	-7.100	3.932	.076	-14.971	.771
	Experi mental	control	7.100	3.932	.076	-.771	14.971
Delayed posttest	control	Experi mental	-7.467	3.898	.060	-15.269	.336
	Experi mental	control	7.467	3.898	.060	-.336	15.269
Based on estimated marginal means							
a. Adjustment for multiple comparisons: Bonferroni.							

Table 5 elucidates mean differences of the control and experimental groups in terms of the pretest, posttest, and delayed posttest. Based on the results of this part, there was no significant difference between the two

groups in none of the three tests (pretest, posttest, and delayed posttest) (i.e. the means scores of the two groups are almost the same in the three tests, therefore the amount of critical thinking is almost the same).

8. Discussion

Nowadays, educationalists feel the need to set education in a critical context. Unequivocally, teaching critical thinking from school systems to college systems is an educational must that can considerably lead learners to develop their critical thinking abilities step by step. In fact, there are numerous strategies to develop critical thinking. One strategy is self-directed learning that is the focus of the present study. Therefore, an attempt has been made in this study to find appropriate answers to the following research questions:

1. Does self-directed learning affect critical thinking of Iranian intermediate EFL learners?
2. Will the effect of self-directed learning on Iranian EFL learners critical thinking be retained over time?

According to the results of the present study, teaching self-directed learning led to the increase of critical thinking of Iranian intermediate EFL learners. It means that learners attempts to evaluate various ideas critically increased as a result of their engagement in self-directed learning. Therefore, their characteristics as self-directed learners, including selecting the learning materials, formulating learning goals, and singling the learning strategies out brought about gains in their level of criticalness. As a matter of fact, they built learning through the utilization of their prior experiences. The findings of the study also demonstrate that teaching self-directed learning resulted in the increase of critical thinking of Iranian intermediate EFL learners over time additionally. It means that in view of the fact that learners practiced self-direction increasingly, their level of criticality was built up from one test to another one. Within the passage of time, learners succeeded in gaining a better understanding of self-directed learning. This unquestionably contributed to a progressive enlargement of learners level of self-directedness that occasioned continuous improvements in learners critical thinking. Learners realized the significance of self-direction imperceptibly. Consequently, they were engaged in the critical thinking activities most wholeheartedly. This substantial keenness to become critical thinkers was strongly tied to the learners consciousness about the need to become self-regulated individuals.

Gokhale (1995) came to the conclusion that collaborative learning enhances critical thinking and was more efficacious than individual learning. The reason lies in the fact that the results of the statistical analysis demonstrated that learners who studied collaborative learning (a type of learning in which learners work in groups) outperformed those learners who took part in individual learning (a type of learning in which learners work individually) in critical thinking. Accordingly, collaborative learning enhances critical thinking through the utilization of assessment of viewpoints, clarification of them, and debates. It was also found that both methods of instruction were equally efficacious in acquiring factual knowledge and both groups did equally well on the drill and practice test.

McMillan (1987, cited in Reed, 1998), who analyzed 27 studies that scrutinized the effect of programs and courses on college students critical thinking skills, came to the conclusion that college attendance promotes critical thinking.

Gabr and Mohamed (2011) carried out a study on the effect of problem-based learning (PBL) on critical thinking abilities of undergraduate nursing students. The results of this study indicated that PBL improved critical thinking. According to the results of this study, 96.15 percent of the students (125 students) concurred that PBL has promoted their critical thinking and 52.30 (68 students) percent of them believed that PBL has improved their self-directed learning. As a matter of fact, PBL led learners to analyze situations or problems critically in order to find appropriate solutions. PBL also inspired them to reshape problems, compound a great deal of feedback, and think of ways to solve problems collaboratively.

Quitadamo and Kurtz's (2007) study indicated that writing promotes critical thinking. They divided biology students into writing, and nonwriting groups. Writing students showed greater gains in analysis, inference, and evaluation skills (three critical thinking skills). Writing significantly affected critical thinking performance, whereas other covariables such as gender, ethnicity, and age did not significantly affect critical thinking

performance. Findings demonstrated that the writing group students significantly surpassed the nonwriting students in the component critical thinking skills of inference and analysis.

In conclusion, it is worth mentioning that the results of this study are in accordance with those of the above-mentioned studies in the field of critical thinking. Like other factors such as collaborative learning, problem-based learning, college attendance, and writing, self-directed learning promotes critical thinking.

9. Conclusion

The results of the statistical analysis indicated that critical thinking has increased in both control and experimental groups, but critical thinking has increased in the experimental group more as a result of teaching self-directed learning. The reason lies in the fact that students from the experimental group put aside their predispositions and looked for pieces of evidence to judge. They were engaged in rational thinking and tried to provide justifications for their viewpoints. They were slow to believe and experienced a change from ordinary thinking to good thinking. Moreover, critical thinking has increased in both groups from one test to the next. Therefore, time, along with self-directed learning, has given rise to the increase of critical thinking. It means that learners drew conclusions in terms of good evidence and critically evaluated various viewpoints increasingly. In fact, their criticality increased over a period of time and they managed to seek the truth and think contrasting points of view over with greater effort than before.

10. Implications

The results of this study suggest that the experience of engaging in critical thinking activities turns learners into active, responsible owners of the learning process by formulating goals, and selecting leaning materials and strategies. Further, language teachers can considerably help learners become autonomous individuals evaluating information to make decisions and solve problems. Last but not least, curriculum developers, through the use of process-oriented, task-based drills and exercises encourage interactive teaching methods that raise learners level of criticality.

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