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On the Relationship between Critical Thinking Ability, Language Learning Strategies, and Reading Comprehension of Male and Female Intermediate EFL University Students

Amir Marzban
Department of English Language, Islamic Azad University, Qaemshahr Branch, Qaemshahr, Iran

Zahra Barati
Allameh Mohaddes Nouri University, Mazandaran, Iran

***Abstract*—This study was going to investigate the relationship between critical thinking ability, language learning strategies, and reading comprehension of male and female Iranian intermediate EFL university students majoring in English translation and English teaching at Tehran Azad University, South Branch. The participants chosen were 100 EFL learners that after homogenizing 79 remained. This study was a correlational one. For the purpose of this study, California Critical Thinking Skill Test (CCTST), Strategy Inventory for Language Learning (SILL), and reading section of the TOEFL test were administered. Data were analyzed based on the questionnaires and they were submitted to the Statistical Package for Social Sciences (SPSS) version 22.0 for analysis. The Pearson- product moment correlation proved that there was a significant positive relationship between critical thinking ability and reading comprehension, as well as a positive relationship between language learning strategies and reading comprehension was found. Reading comprehension was considered as dependent variable. Finally, in order to find whether there was any difference between males and females in terms of critical thinking ability and their language learning strategy use an independent sample t-test was run. The findings revealed that there was not any significant difference between the performances of male and female participants in terms of critical thinking and their language learning strategy use. The findings of this study will be helpful for material developers, syllabus designers and EFL teachers.**

***Index Terms*—critical thinking, language learning strategies, and reading comprehension**

I. Introduction

Thinking is an exceptional process in people lives which helps them solve the problems they are faced with, make appropriate decisions, and obtain the purposes that gives their life satisfaction (Chaffee, 2010). In the modern society, the ability to think critically and to question the validity of the claims when weighing evidence before decision making is very important. John Dewey (1993) was the first person who spoke about the importance of reflective thinking about 70 years ago (Richardson, Morgan, & Fleener 2009). An essential element of learning is fostering students' potentiality and teaching them critical thinking skills. Language learners may read different types of texts. Reading will be useful when the learners can apply critical thinking skills and language learning strategies. Both critical thinking skills and language learning strategies are essential factors in the development of reading skill. As Chaffee (2010) states "critical thinking is an activity that is crucial for living in a meaningful way. College provides students with a unique opportunity to develop their mind in the fullest sense. As they are introduced to various disciplines, they learn new ways to understand the world, and they elevate their consciousness as a result" (p. 4). Critical thinking is one's mental power that expresses complicated opinions, whereby, one can predict evidence and make logical judgment, and then give suitable attention to context (Moon, 2008). Critical thinking skills help students to be skeptical and enable them to analyze and interpret opinions. These skills help them to make more instructed decisions about the accuracy and effectiveness of propositions. Those students who develop critical thinking skills can go beyond the surface of the subjects they are studying and engage in critical statements and arguments (Cottrell, 2005).

For a learning process be effective, students should be able to apply both critical thinking skills and language learning strategies in an appropriate way. Different definitions of language learning strategies are proposed by many researchers but Oxford presented a more comprehensive strategy system. Language learning strategies are definite actions which are used by the learner to facilitate learning and to make it more pleasing, more self-directed, more effective, and later can be conveyed to new contexts (Oxford, 1990).

One of the most important skills which has been taken into account in recent years is the ability to read in a foreign language. As Chastain (1988) says "reading is the skill in which the students will have the greatest ability at the end of a

course emphasizing the four language skills. It is the skill that students will have the most opportunities to use and that they can use most comfortably" (p. 219). Grellet (1981) says that "reading is an active skill….it constantly involves guessing, predicting, checking, and asking oneself questions" (as cited in Chastain, 1988, p. 223). Some believe that many facets of reading express useful problem-solving strategies in order to solve various difficulties in reading. In 1917, Thorndike described reading as a process of drawing conclusions. Many of the strategies which are applied by readers to realize meanings approach to logical processes as deduction and inference, and also skilled readers are those who are able to think obviously. Thinking critically about what is being read is an important way of stressing reflection. By fortifying the reading experience through critical thinking, teachers can make students to think about the materials in new ways (Alderson, 2000). Effective readers are capable of analyzing, evaluating, synthesizing, and interpreting what is being read with regard to the content of the materials. They can use background knowledge in order to make inferences from texts and use different strategies during reading. They are also able to think about the materials and to evaluate them while they are reading the texts. One of the requirements of the modern world is the existence of skillful readers and high-level thinkers. A reader is capable of processing a text at higher levels of thinking process during deep comprehension. The reader can make the meaning by using Benjamin Bloom's taxonomy of critical thinking (1956) which composed of evaluation, synthesis, analysis, and interpretation. Good readers can check own comprehension, interpret and summarize materials as they read, and process text at complicated levels of thinking. Finally, skilled readers can discuss what is being read deeply (Tankersley, 2003).

In second language learning, reading critically is important and leads to lifelong learning, especially in academic settings and one of the requirements for language learners has been making use of critical thinking skills in an appropriate way. Critical reading needs some skills and attitudes which are built around a group of related critical questions. While students learn these skills, their goal will be the application of these skills together to find the most appropriate decisions. Thinking carefully is always an unfinished project. Critical questions act as stimulus for critical thinking; they help students make better decisions and judgments (Browne and Keeley, 2007). Because of the importance and the influential effects of critical thinking ability and language learning strategies in the process of learning the four language skills especially reading skill, more research is needed to evaluate its efficacy.

Regarding the issues mentioned so far, the present study has been investigated the relationship between critical thinking ability, language learning strategies, and reading comprehension of Iranian intermediate EFL male and female students. For this purpose language learning strategies and the critical thinking skills has been taken into account while giving the reading section of TOEFL test.

The present study has answered the following questions:

1) Is there any relationship between critical thinking ability, language learning strategies, and reading comprehension?
2) Is there any statistically significant difference between critical thinking ability of males and females?
3) Is there any statistically significant difference between males and females in their language learning strategy use?

II. Review of Literature

A. Benjamin Bloom's Taxonomy of Critical Thinking

Human thinking skills have been classified by Benjamin Bloom (1956) into six important classes of knowledge, comprehension, application, analysis, synthesis, and evaluation which composed his cognitive domain. 'Knowledge' is the lowest level in the cognitive domain and is the ability to remember the previously learned materials either by recall or recognition. Knowledge is classified from the specific and concrete materials to the intricate and abstract ones. 'Comprehension' is the lowest level of understanding which comes after knowledge. It is the ability to understand the meaning of the materials and use them without necessarily relating them to other materials. 'Application' is the ability to use abstract materials in concrete situations, in other words, the ability to apply the previously learned materials to appropriate situations in life. 'Analysis' is the ability to breakdown materials into its separate parts in order to make ideas clear. It enables one to distinguish between facts and inferences. 'Synthesis' refers to the ability to put parts together in order to make a new whole. It contains the process of working with parts and then arranging and combining them in order to make a clear pattern. This category stresses creative behaviors on the part of the learner. 'Evaluation' is the last level of the taxonomy and the most complex one because it involves the combination of all the other levels of knowledge, comprehension, application, analysis, and synthesis. Evaluation is the ability to judge the value of the materials and ideas for a given purpose based on some criteria and standards to make sure about the accuracy and effectiveness of the materials (Bloom, 1956).

Here is a concise summary of some researches that show the importance of teaching critical thinking skills in educational settings and also in various contexts;

Several studies confirmed the relationship between critical thinking and reading comprehension.

A study was conducted by Fahim, Bagherkazemi, & Alemi (2010) to explore the relationship between test takers' critical thinking ability and their performance on the reading test of TOEFL. To this end, 83 EFL learners were asked to complete Watson-Glaser Critical Thinking Appraisal (WGCTA), and a test of reading. The findings showed that those with high level of critical thinking skills were performed better than low level critical thinkers. Moreover, a positive correlation was reported between critical thinking ability and their performance on the reading test.

A study was conducted by Dehghani, Jafari Sani, Pakmehr, and Malekzadeh (2011) to investigate the relationship between students' self-efficacy and critical thinking among university students. General Self-efficacy Scale and the CCTST were completed by 216 students. The result of this study showed that there was a significant positive relationship between students' self-efficacy and critical thinking. Hence, to develop students' critical thinking skills, self-efficacy should be taken into account. Furthermore, the researchers did not find any significant difference between students' critical thinking by gender.

B. Taxonomy of Language Learning Strategies

Language learning strategies have been classified by many scholars but Oxford (1990) presented a more conclusive and detailed framework. Language Learning strategies are steps which are used by students to increase their own learning. These steps can help learners to acquire, store, retrieve, and apply the material. Language learning strategies are classified into direct and indirect classes. Also, these two classes are composed of the subclasses of memory, cognitive, and compensation under the direct class; and metacognitive, affective, and social under the indirect class. These two classes support each other, and that each strategy group is capable of making connection to every other strategy group (Oxford, 1990).

Several studies confirmed the relationship between language learning strategies and reading comprehension.

A study was conducted by Onur Cesur (2011) to investigate the relationship between Turkish university students' language learning strategies and their achievement in reading comprehension skill. The participants were 368 university prep class students who completed Oxford's (1990) SILL and the English Language Placement Test. The results of this study showed a significant correlation between language learning strategies such as cognitive, memory, and compensation and students' achievement in reading comprehension in foreign language.

A study was conducted by Kaur and Embi (2011) to identify and compare the language learning strategies used by male and female primary school students. For the purpose of this study a background information questionnaire and a bilingual Language Strategy Use Questionnaire were applied. According to the results, a significant difference was found in the overall use of strategies between both male and female students. Furthermore, female students showed higher tendency of using overall language learning strategies than that of their male counterparts.

A study was conducted by F. Salahshour, Sharif, and N. Salahshour (2013) to investigate the relationship between choice of learning strategies and their frequency among male and female Iranian high school students by considering their level of proficiency. The results of this study revealed that learning strategies were used with medium frequency; metacognitive strategies had the most frequency of usage, while cognitive strategies had the least frequency of usage. Furthermore, the use of learning strategies regarding the students' proficiency level and gender was investigated. Those students with a high level of proficiency used more strategies, as well as more use of metacognitive and social strategies. According to results, female students used learning strategies more than male students.

III. Methodology

A. Participants

The participants contributed to this study were 100 EFL students, majoring in English translation and English teaching at Azad university of Tehran, South Branch. They consisted of both male and female students, ranging in age from 20 to 32 years old. They were selected based on convenient sampling. There were 60 female and 40 male students that after homogenizing 31 male and 48 female remained. Also in this study the participants' gender as an essential variable has been taken into account.

B. Instrumentation

Nelson proficiency test was administered for the purpose of measuring the participants' level of proficiency. For the purpose of the current study, the researcher piloted it on a group of 20 EFL students in the context of Iran and the Cronbach's alpha turned out to be .76.

The Persian version of the California Critical Thinking Skill Test (CCTST), Form B was employed to determine participants' critical thinking ability. It has been designed to measure students' critical thinking ability at university level.

The Persian Version of California Critical Thinking Skill Test consists of 34 multiple-choice questions each followed by 4 or 5 alternatives. The reliability of CCTST was .62 (Khalili & Hosseinzadeh, 2003).

Oxford's SILL version of 7.0 was administered to measure the language learning strategies of participants. This questionnaire includes 50 items and consists of five major parts, and designed to gather information about how students of a second or foreign language learn English. According to oxford (1990) mean scores that occur between 1 and 2.4 can be classified as low, mean scores that occur between 2.5 and 3.4 can be classified as medium, and mean scores that occur between 3.5 and 5 can be classified as high strategy use. For this purpose it was piloted on a group of 20 EFL students and the reliability estimate of the test using Cronbach's alpha turned out to be .89.

The reading section of the TOEFL test was applied in order to realize the participants reading comprehension ability. The test was composed of 25 items. The test is a standard test and its reliability and validity is approved. However, for

the purpose of this study, the researcher piloted it on a group of 20 EFL students in the context of Iran and the Cronbach's alpha turned out to be .65.

C. Procedure

First, to homogenize the participants Nelson test of language proficiency was administered. It consisted of 50 multiple choice items and it took around 45 minutes for the participants to complete the test. Nelson proficiency test measure the participants' general knowledge on grammar and vocabulary. Those who scored between one standard deviation above and below the mean score were selected to take part in this study. Second, to determine the participants' critical thinking ability, the Persian version of California Critical Thinking Skill Test (CCTST) Form B with 34 items was administered to measure their critical thinking skills in each of the five skills of critical thinking. It took around 45 minutes for the participants to complete the test. Third, the questionnaire of Strategy Inventory for Language Learning (SILL) version 7.0 with 50 items was used to reveal the extent to which the Iranian EFL students use language learning strategies. It took around 30 minutes for the participants to complete the questionnaire. And finally, the reading section of the TOEFL test was administered to find out the reading comprehension ability of the participants. The test included 3 passages, followed by 25 items. Therefore, the time allotted to take this test was 25 minutes.

IV. Results and Discussions

In order to answer research question one, the Pearson product-moment correlation coefficient was computed to ensure the relationship between critical thinking and reading comprehension. By calculating the correlation (table 1), the researcher found that there is positive correlation between these two variables.

TABLE 1.
THE CORRELATION BETWEEN CALIFORNIA CRITICAL THINKING SKILL TEST AND READING COMPREHENSION

		Critical Thinking	Reading Comprehension
Critical Thinking	Pearson Correlation	1	.307**
	Sig. (2-tailed)		.006
	N	79	79
Reading Comprehension	Pearson Correlation	.307**	1
	Sig. (2-tailed)	.006	
	N	79	79

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

The Pearson product-moment correlation coefficient was found to be .307 which is high and significant (P-value= .006<0.01). Also the Pearson correlation (.307) is higher than the Critical value of the Pearson product-moment correlation coefficient (.301) with degree freedom of (N-2=77). This shows that there exists a positive relationship between the participants' critical thinking ability and their reading comprehension scores. The result is in accordance with the findings of Fahim et al. (2010) came to the conclusion that test takers with higher critical thinking abilities showed better performance on reading comprehension section of TOEFL.

The other part of the research question one is that whether there is a relationship between language learning strategies and reading comprehension. The Pearson product-moment correlation coefficient was computed to ensure the relationship between language learning strategies and reading comprehension. By calculating the correlation (table 2), the researcher found that there is positive correlation between these two variables.

TABLE 2.
THE CORRELATION BETWEEN LANGUAGE LEARNING STRATEGIES AND READING COMPREHENSION

		Language Learning Strategies	Reading Comprehension
Language Learning Strategies	Pearson Correlation	1	.586**
	Sig. (2-tailed)		.000
	N	79	79
Reading Comprehension	Pearson Correlation	.586**	1
	Sig. (2-tailed)	.000	
	N	79	79

**. Correlation is significant at the 0.05 level (2-tailed).

The Pearson product-moment correlation coefficient was found to be .586 which is high and significant (P-value= .000<0.05). Also the Pearson correlation (.586) is higher than the Critical value of the Pearson product-moment correlation coefficient (.231) with degree freedom of (N-2=77). This shows that there exists a positive relationship between the participants' language learning strategy use and their reading comprehension scores. The results of this study support the findings of Onur Cesur (2012), in which he found that language learning strategies have direct influence on the achievement in reading comprehension in foreign language significantly.

Table 3 shows the mean scores of male and female participants on their critical thinking ability.

TABLE 3.
DESCRIPTIVE STATISTICS OF CRITICAL THINKING ABILITY

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Critical Thinking	male	31	12.16	2.684	.482
	female	48	11.69	2.815	.406

As table 3 shows, the mean score of male participants at critical thinking is 12.16 and the mean score of female participants at critical thinking is 11.69. This shows that there is not a significant difference between male and female participants' critical thinking. The concrete realization of the results has been shown in bar graph (Fig. 1).

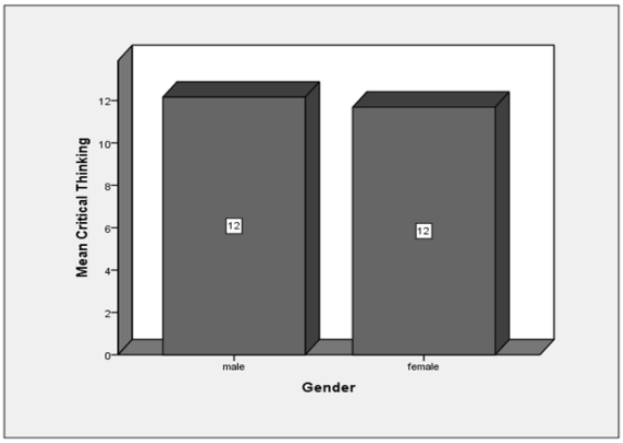

Figure 1. Group Mean Scores For The Comparison Between Males And Females Critical Thinking

"Fig. 1" indicates that the difference between critical thinking of both males and females is non-significant. An independent sample t-test was used to explore whether the difference between male and female participants in terms of their critical thinking ability (table 4) is significant.

TABLE 4.
INDEPENDENT SAMPLE T-TEST OF CRITICAL THINKING

		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
Critical Thinking	Equal variances assumed	.000	.984	.744	77	.459	.474	.637	-.795	1.742
	Equal variances not assumed			.751	66.365	.455	.474	.630	-.785	1.732

As table 4 shows, the sig. of Levene's test is (.984) that is higher than .05. This indicates that the difference between males' and females' critical thinking is non-significant and the sig. of the t-test is (.459) which is higher than .05, so there is not any difference between male and female participants' critical thinking ability and it can be concluded that gender is not an effective element in the ways of thinking. Therefore the null hypothesis is accepted. The results of this study support the findings of Myers and Dyer (2006); Dehghani et al. (2011). In these two studies, it was found that there were no differences between the critical thinking skills of male and female students.

Table 5 shows the mean scores of male and female participants on their language learning strategies.

TABLE 5.
DESCRIPTIVE STATISTICS OF LANGUAGE LEARNING STRATEGIES

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Language Learning Strategies	male	31	3.097	.4644	.0834
	female	48	3.188	.4893	.0706

As table 5 shows, the mean score of male participants' language learning strategies is 3.097 and the mean score of female participants' language learning strategies is 3.188. This shows that there is not a significant difference between male and female participants' language learning strategy use. The concrete realization of the results has been shown in bar graph (Fig 2).

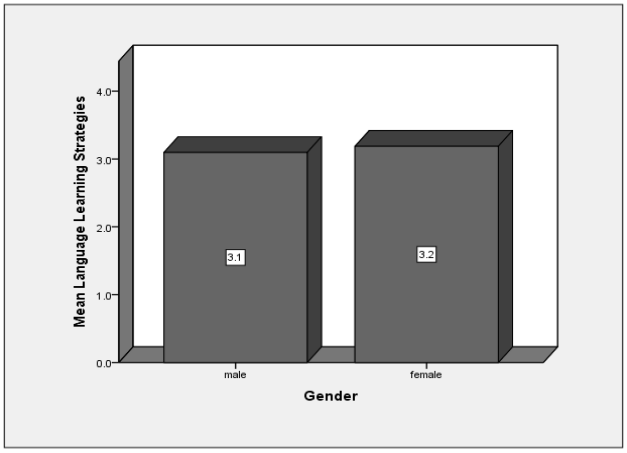

Figure 2. Group Mean Scores For The Comparison Between Males And Females Language Learning Strategies

"Fig. 2" indicates that the difference between language learning strategies of both males and females is non-significant. An independent sample t-test was used to explore whether the difference between male and female participants in terms of their language learning strategy use (table 5) is significant.

TABLE. 6.
INDEPENDENT SAMPLE T-TEST OF LANGUAGE LEARNING STRATEGIES

		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
Language Learning Strategies	Equal variances assumed	.070	.792	-.821	77	.414	-.0907	.1105	-.3108	.1294
	Equal variances not assumed			-.830	66.591	.409	.-0907	.1093	-.3089	.1274

As the table 6 shows, the sig. of Levene's test is (.792) that is higher than .05. This indicates that the difference between males' and females' language learning strategy use is non-significant and also the sig. of the t-test is (.414) which is higher than .05, so there is no difference between male and female participants in terms of their language learning strategy use and it can be concluded that gender is not an effective factor in the ways of using language learning strategies. Therefore the null hypothesis is accepted. This result does not support the findings of Salahshour et al. (2012); Kaur and Embi (2011) in which they reported that females used language learning strategies more frequently than males.

V. CONCLUSIONS

Critical thinking ability is one of the most important skills that should be acquired by students while reading a text along with the usage of appropriate language learning strategies. To sum up, this study indicated that there was a positive relationship between critical thinking ability and reading comprehension ability of Iranian EFL learners in general. Moreover, a positive relationship was observed between Iranian EFL learners' between their language learning strategies and reading comprehension. It means that improvements in critical thinking and their language learning strategies are paralleled by improvements in reading comprehension. In order to act impressively in the modern society, solve various problems, and encourage autonomic learning, everyone must have the capability of thinking critically and reasoning efficiently. Since a significant relationship was found between the critical thinking ability and reading comprehension, it can be concluded that utilization of critical thinking skills can help students to enhance their understanding in reading. Since the participants in this study did not get acceptable grades in critical thinking test, therefore, applicable course books and materials that invoke critical thinking must be compiled for higher educational purposes and also for those who are studying English academically. Moreover, the difference between critical thinking and strategy use of males and females was also investigated. The results showed that there is no difference between these two groups in the use of their critical thinking ability and language learning strategies. So it can be concluded that gender is not an influential factor in students' ways of thinking and language learning strategy use.

This study will be useful to the university students, since there is not much attention given to the way they read. Actually, the process of their leaning is largely ignored.

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Amir Marzban is an assistant professor of TESOL at Islamic Azad University, Qaemshahr branch. His research interests include conversation analysis, L2 reading & writing, CALL, and teacher education. He has published in both Iranian and International journals and also has presented in many international conferences.

Zahra Barati was born in Tehran, Iran in 1987. She received her MA degree in TEFL from Allameh Mohaddes Nouri University, Iran in 2015.

She is teaching English in language institutes in Tehran. Her research interests are reading comprehension and psychological studies regarding foreign language learning.