

On the Relationship between Iranian EFL Students' Critical Thinking Ability and Their Reading Comprehension Micro-Skills

Farhad GhorbanDordiNejad^{a*} and Mokhtar Heydari^b

^{a*}TEFL Department, Shahid Rajaei Teacher Training University (SRTTU),
Tehran, Iran;

^b Ministry of Education, Isfahan, Iran

Abstract

It is hypothesized in the present study that when learners read an English text, they use their critical thinking ability beyond the language components such as meaning of words and structure of sentences to understand it better. The major goal of the present study is to examine whether there is any relationship between the learners' critical thinking ability and their reading comprehension score in general and their micro-skills (i.e. inference, main idea, and specific details) in particular. Also, this study tries to investigate the difference between the learners' critical thinking ability and their reading comprehension skills with regard to their gender. For this purpose, 120 (68 females and 52 males) Iranian EFL students majoring in Translation, English literature and English teaching of the English department in Isfahan state university in Iran participated by accomplishing two tests. This study showed that there is a close relationship between the learner's critical thinking ability and their reading comprehension score ($r = .73$), and their reading micro-skills: inference ($r = .64$), main idea ($r = .63$), and specific details ($r = .53$). On the other hand the study showed that gender is not a determinant in critical thinking ability nor in reading comprehension.

Keywords: critical thinking ability, reading comprehension, micro skills, EFL students

Corresponding author's e-mail: farhad@srttu.edu

Rationale

Critical thinking includes the cognitive skills of using reasoning, making inference, making decisions and evaluating. Humans use critical thinking skills to analyze arguments and solve problems. Reasoning well is a skill which is valuable to anyone who wants to understand and deal with the natural and social worlds. Scientists need to reason well in order to understand the causes of phenomena. Politicians need to reason well in order to be able to adopt the right policies. Hence, we cannot leave reasoning to scientists and politicians because we all want to know whether what they tell us and what they prescribe for us is right. Reasoning well is an important skill for all of us.

In the educational fields, critical thinking has recently been noteworthy. Much has been said, written and done on critical thinking and its relation to other subjects. Roghanizadeh (2011) reported a linkage between self-regulation and critical thinking. His study indicated that among the components of critical thinking, 'evaluation of arguments' and 'interpretation' have the highest correlations with teachers' self-regulation. In addition, significant correlations were found between teachers' self-regulation, their teaching experience, and their age.

Babamohammadi and Khalili (2005) showed that the students of continuous BS level in nursing had a higher level of critical thinking skills than the students of interrupted BS studies. According to them, the students in advanced years of study own higher levels of critical thinking skills than those in lower terms. In other words, nursing education and higher education have led to a development of students' critical thinking skills.

In another study Nikooupour, AminiFarsani and Nasiri (2011) reported a significant relationship between specific direct and indirect language learning strategies such as cognitive, metacognitive, and social with critical thinking. They showed that memory, compensation, and affective strategies have no relationship with critical thinking.

Jamshidian and Khamijani Farahani (2010) conducted a research on the relationship between critical thinking and nativeness, age, and gender. Their study showed that there is a significant relationship between nativeness and the level of critical thinking;

however, there is no relationship between age, gender and the critical thinking level.

Einav and Miriam (2011) conducted a study to explore whether teaching specially designed learning unit would enhance the students' critical and or creativity thinking. According to Einav and Miriam, unit "Probability in Daily Life" was taught to a group of tenth-grade students with the purpose of encouraging critical thinking dispositions such as open-mindedness, truth-seeking, self-confidence and maturity. The findings of their research would likely be used to plan new study programs and methods that can be based on the connection between critical thinking, creative thinking and the study of mathematics.

Nuray and Sezgi (2010) explored the common belief that eastern learners, including Turkish learners, lack critical thinking skills due to their traditional social structure. As language and cognition were tightly related in the process of language production, their main concern was whether the problem was rooted in cultural disposition. Their study supported the ongoing discussion on the eastern way of thinking, which is fostered by such social maxims as social harmony, respect and humbleness.

Mendenhall and Johnson (2010) conducted a study to determine whether there was a change in reading comprehension, critical thinking and meta-cognition skills by using the SAM-LS instructional strategies. Results indicated that HyLighter may help students in several areas including enhancing the students' ability to think critically.

In 2009, VanTassel, Bracken, Feng and Brown conducted a longitudinal study of student growth gains to assess growth in reading comprehension and critical thinking. Results suggested that all students benefited from the intervention of Project Athena units of study designed for high-ability learners. In addition, the study suggested that the comparison curriculum also benefited learners.

Fitzpatrick (1994) showed that teachers can assist improving the reading comprehension skills of students by using critical thinking strategies which can be integrated into the curriculum and adapted to many grade levels. He described strategies grouped under microcomputer instruction, cooperative learning, and higher-order questions and commended that teachers integrate critical thinking strategies into their reading curriculum.

Long (1992) showed that reading strategy checklist can be used as a cooperative learning program to increase reading comprehension, develop critical thinking skills, improve written communication skills, and enhance whole class discussions.

In another study, Kaufman (1992) used the teaching techniques of semantic webbing and brainstorming to improve students' reading skills. According to her, some behavior changes were observed, including improved skills in critical thinking, increased brainstorming for problem-solving, better interpersonal communication and use of positive challenges, and application of thinking skills to other subjects. These indicated that the technique was somewhat effective in increasing reading comprehension and developing critical thinking skills.

Verawati, SitiRahayah, Rodiah and Nor Azaheen (2010) conducted a study to determine the critical thinking ability of male and female students in Malaysia aged 16-17 years using MyCT instrument. Their study showed that there was no significant difference between the critical thinking of male and female students.

Dehghani, Jafarisani, Pakmehr and Malekzadeh (2011) in a study aimed to investigate the relationship between students' self-efficacy and critical thinking in Ferdowsi University of Mashhad, Iran. Their findings showed a significantly positive relationship between students' self-efficacy and critical thinking. They believed that self-efficacy as a motivational factor should be considered in developing learners' critical thinking skills.

Cavus and Uzunboylu (2009) investigated the effect of mobile learning over the critical thinking skills. They found that students' attitudes toward the usefulness of a mobile learning system and creativity improved significantly at the end of the experimental study.

In another study Tae-Il (2004) examined the effect of gender on English reading comprehension of Korean EFL (English as a Foreign Language) learners. The results of the study indicated that items classified as Mood/Impression/Tone tended to be easier for females, whereas items classified as Logical Inference were more likely to favor males regardless of item content.

Research Questions and Hypotheses

The research questions of this study are as follows:

1. Is there any relationship between Iranian students' critical thinking skills and their reading comprehension ability?
2. Is there any relationship between Iranian students' critical thinking skills and reading comprehension micro-skills - main idea, specific details and inference scores?
3. Is there any difference between Iranian male and female students' reading comprehension micro-skills - main idea, specific details and inference?
4. Is there any difference between Iranian male and female students' critical thinking skills?

Based on the above research questions, there are four null hypotheses:

1. There is no relationship between Iranian students' critical thinking skills and their reading comprehension ability.
2. There is no relationship between Iranian students' critical thinking skills and reading comprehension micro-skills - main idea, specific details and inference scores.
3. There is no difference between Iranian male and female students' reading comprehension micro-skills - main idea, specific details and inference.
4. There is no difference between Iranian male and female students' critical thinking skills.

Method

Participants

The population of this study composed of all the state university BA students studying EFL in Iran. The EFL students in Iran study in three different majors namely Translation, English Literature and Teaching English. In choosing our sample, the researchers decided to include all three majors in the study. As Isfahan State University offers all three majors, this university was chosen in order for the sample to be a true representative of the

population. The researchers had to have students from state universities all around Iran, but because it was impossible, we decided to use students in a university that come from different parts of the country. Again because Isfahan State University accepts students through National Examination (Konkoor) coming from all over Iran, we believe that these students are a true sample of the whole population – Iranian state university students. In our sample we have students from Sistan and Baloochestan, Ilam, Khoozestan, khorasan, Azarbayjan, Hamadan, Kerman, Tehran, Isfahan and some other places.

Instrumentation

Two tests in this research were used. The first instrument is the reading comprehension test from TOEFL which was a bit modified to meet the requirements of the present study. Because only three micro-skills of reading comprehension namely main idea, inference and specific details based on their commonality and importance were taken into account, questions related to other micro-skills such as understanding sequence, making comparisons, and making predictions were discarded. The reading comprehension test includes six relatively short readings, each followed by five questions: one main idea question, two specific details questions and two inference questions.

The second test is the California Critical Thinking Skills Test (CCTST Form B), which was used to differentiate the level of critical thinking skills of the participants. The test is intended for college level and post-baccalaureate student populations. It includes 34 multiple-choice items which tests five different skills: analysis, interpretation, inference, explanation, evaluation and self-regulation.

Procedure

We started the study by collecting information about the theory, background, and the related literature. Then, considering all available critical thinking scales, the CCTT form B was chosen because of its wide use in the academic fields and because of its reliability and validity support as valid and reliable scale used in Iran. Also, scrutinizing the available scales for reading comprehension

assessment, the reading comprehension test was taken from TOEFL. Then, we modified the TOEFL reading test to meet our requirements. In an appropriate time, at first the participants answered the questionnaire (CCTST), then they take the reading comprehension test.

Data Analysis

Like most of the research studies on humanities the significance, level of the study was set on 0.05 to decide whether the hypotheses are accepted or rejected. Based on the research questions, different statistics were used. First, descriptive statistics were used to describe the characteristics of the sample. To test the first hypothesis, correlation coefficient was run to find the relationship between Critical Thinking and reading comprehension micro-skills. Correlation coefficient was also used to test our second hypothesis concerning the relationship between Critical Thinking skills and reading comprehension micro-skills. To find the difference between reading comprehension micro-skills among males and females, a multivariate analysis of variance was run in which gender was assumed as the independent factor and reading comprehension micro-skills as dependent variables to test the difference between male and female scores in reading comprehension micro-skills.

Results and discussion

Research question 1:

"Is there any relationship between Iranian students' critical thinking skills and their reading comprehension scores in general?"

Pearson product-moment correlation coefficient was used to analyze the data. The following table shows the correlation coefficient between reading comprehension and critical thinking.

Table 1
Correlation coefficient between reading comprehension and critical thinking

		Total critical thinking	Total reading comp
Total critical thinking	Pearson Correlation	1	.730**
	Sig. (2-tailed)		.000
	N	120	120
Total reading comp	Pearson Correlation	.730**	1
	Sig. (2-tailed)	.000	
	N	120	120

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

Preliminary analyses were performed to ensure no violations of the assumptions of normality, linearity and homoscedasticity. As is shown in table 1, there was a strong, positive correlation between the two variables, $r = .73$, $n = 120$, $p < .000$, with high level of reading comprehension associated with high level of Critical Thinking. This indicates that the hypothesis is rejected and there is a strong relationship between Iranian students' critical thinking skills and their reading comprehension skills. This finding is consistent with other findings in this area in Iran and other countries, such as Nikoopour, AminiFarsani and Nasiri (2011), Jamshidian and Khamijani Farahani (2010), Dehghani, Jafarisani, Pakmehr and Malekzadeh (2011), Roghanizadeh (2011), and Nuray and Sezgi (2010).

Research question 2:

"Is there any relationship between Iranian students' Critical Thinking skills and reading comprehension micro-skills - main idea, specific details and inference skills?"

Preliminary analyses were performed to ensure no violations of the assumptions of normality, linearity and homoscedasticity.

Table 2 shows the results of correlation between critical thinking and reading comprehension micro-skills.

Table 2

Correlation between critical thinking and reading comprehension micro-skills

		Total critical thinking	Total specific detail	Total inference	Total main idea
Total critical thinking	Pearson Correlation	1	.537**	.647**	.635**
	Sig. (2-tailed)		.000	.000	.000
	N	120	120	120	120
Total specific detail	Pearson Correlation	.537**	1	.571**	.337**
	Sig. (2-tailed)	.000		.000	.000
	N	120	120	120	120
Total inference	Pearson Correlation	.647**	.571**	1	.555**
	Sig. (2-tailed)	.000	.000		.000
	N	120	120	120	120
Total main idea	Pearson Correlation	.635**	.337**	.555**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	120	120	120	120

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

As shown in Table 2, there was a strong, positive correlation between critical thinking and reading comprehension micro-skills: main idea, specific details and inference. The interesting point here was that the correlation between critical thinking and inference and main idea was much stronger, respectively, $r = .64$, $n = 120$, $p < .000$ and $r = .63$, $n = 120$, $p < .000$, than the correlation between Critical Thinking and specific detail, $r = .53$, $n = 120$, $p < .000$. These results reject the null hypothesis. There is a strong relationship between critical thinking and reading comprehension micro-skills. Returning back to the stronger correlation between critical thinking and inference, this may be related to the findings of other studies like Einav and Miriam's (2011).

Research question 3:

"Is there any difference between Iranian male and female students' reading comprehension micro-skills: main idea, specific details and inference?"

A one-way between groups multivariate analysis was performed to answer this question. Three dependent variables were used: main idea, specific details and inference. The independent variable was gender. Preliminary assumption testing was conducted to check for normality, linearity, univariate and multivariate outliers and homogeneity, with no serious violations noted. Table 3 shows that the assumption of homogeneity of variance-covariance matrices has not been violated: $p = .014 > .001$. Table 3 shows the results of multivariate analysis of variance between male and female students' reading comprehension micro-skills. As is evident in Table 3, the value of $p = .188 > .05$ indicating that the difference between male and female students' main idea, specific details and inference mean scores is not significant. Hence, our hypothesis is not rejected.

This confirms the studies done by Verawati, SitiRahayah, Rodiah and Nor Azaheen's (2010). Their study showed that there was no significant difference between the critical thinking of male and female students. Cavus and Uzunboylu (2009) also reported similar results indicating equality of males and females in respect with critical thinking skills. This is however, in contrast with Tae-Il (2004) study on the effect of gender on English reading comprehension of Korean EFL (English as a Foreign Language) learners. The results of the that study indicated that items classified as Mood/Impression/Tone tended to be easier for females, whereas items classified as Logical Inference were more likely to support males regardless of item content. Maybe this can be explained by the nuanced differences between males and females regarding main idea, specific details and inference that we found in the present study.

Table 3
Multivariate tests

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.967	1.133E3 ^a	3.000	116.000	.000	.967
	Wilks' Lambda	.033	1.133E3 ^a	3.000	116.000	.000	.967
	Hotelling's Trace	29.306	1.133E3 ^a	3.000	116.000	.000	.967
	Roy's Largest Root	29.306	1.133E3 ^a	3.000	116.000	.000	.967
gender	Pillai's Trace	.040	1.622 ^a	3.000	116.000	.188	.040
	<u>Wilks' Lambda</u>	.960	1.622 ^a	3.000	116.000	<u>.188</u>	.040
	Hotelling's Trace	.042	1.622 ^a	3.000	116.000	.188	.040
	Roy's Largest Root	.042	1.622 ^a	3.000	116.000	.188	.040

a. Exact statistic

b. Design: Intercept + gender

Research Question 4:

"Is there any difference between Iranian male and female students' critical thinking scores?"

An independent-samples t-test was conducted to compare the critical thinking skills of males and females. Table 4 shows the results of independent-samples t-tests.

As the table shows, because the significance of Levene's test for equality of variances is larger than .05 ; the assumption of equal variances has not been violated; therefore the first line in the table which refers to the Equal variances was considered. Considering t-test for equality of means, the value of significance (2-tailed) = .86 >.05; shows that there is no significant difference between males and females with respect to their critical thinking skills; hence, the null hypothesis was not rejected. The discussion provided for question

three is also true about question four. There seems to be a discrepancy in the results of studies regarding males and females' critical thinking skills. This may be due to some sex bias.

Table 4
Independent-samples t-test results

		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
Total critical thinking	Equal variances assumed	.325	.570	.172	118	.864	.14253	.829	-1.500	1.78
	Equal variances not assumed			.173	112.257	.863	.14253	.824	-1.4909	1.77

Conclusion

This study showed that there is a close relationship between reading comprehension and Critical Thinking in general and between Critical Thinking and reading comprehension micro-skills: main idea, specific details and inference in particular. In fact reading and thinking and especially critical thinking are interconnected, and they are dependent on each other closely. Making inferences, getting the main idea and reaching to the conclusions based on details, assumptions, arguments and premises are common to both reading comprehension and critical thinking processes.

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About the Authors

Farhad GhorbanDordinejad is presently an Assistant Professor at the Shahid Rajae Teacher Training University (SRTTU) in Tehran, Iran. He finished his PhD in TEFL. His current research interests are teacher education, self-regulation, motivation and critical and reflective thinking skills. He has published in local and international refereed journals and has presented his studies at different international conferences. (Email: farhad@srttu.edu)

Mokhtar Heidary is presently an English language teacher in Isfahan, Iran. He finished his MA in TEFL at the Shahid Rajae Teacher Training University (SRTTU). His main research interests are critical thinking and creativity.