

## **Critical Thinking: A Reading Strategy in Developing English Reading Comprehension Performance**

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### **Abstract**

There is a general consensus that critical thinking can be influential in almost every occupation due to its association with the abilities such as problem solving and decision making. This paper aims at probing the role of critical thinking (CT) skills on EFL learners' reading comprehension performance using Bloom's taxonomy. Therefore, the role of CT strategies training across two language proficiency levels, high & low, was investigated. Then the difference between females and males regarding their CT was studied. In so doing, 240 male and female Iranian EFL students were selected and screened into two proficiency levels based on the Longman preparation course for TOEFL test. Each proficiency group was divided into critical and non-critical group. The results suggested CT skills significantly affected EFL learners' reading comprehension performance. However, the effect of critical thinking strategy training didn't vary across different language proficiency levels. Overall, the findings provide empirical support for the facilitative effect of critical thinking strategy training on reading comprehension performance of EFL learners.

**Keywords:** critical thinking, strategies training, gender, reading comprehension, language proficiency,

### **Introduction**

Despite the controversy over a unified definition for CT, there is a general consensus that CT can be influential in almost every discipline and occupation, due to its association with abilities such as problem solving and decision-making. In educational setting, it is widely accepted that learning to think is one of the

most important goals of formal schooling. Dewey (1933) stated that the central purpose of education is learning to think. As part of that education, learners need to develop and learn to apply CT skills to their academic studies effectively (Kealey, Holland & Watson, 2005), to the complex problems that they will face in their professions (Yeh, 2004), and to the critical choices they will be forced to make as a result of the information explosion and other rapid technological changes (Oliver & Utermohlen, 1995). In L2 context, it seems that attention to CT deserves the additional considerations due to the position of problem-solving, attitudes, self-regulation, and meta-cognitive abilities in L2 classes.

Likewise, more recently, ways in which CT might be interpreted and taught have become highly debated questions for L2 learning scholars and practitioners (Thompson, 2002). A shift has occurred from viewing learning primarily as rote training to conceptualizing learning as a constantly evolving process of discovering, questioning, and reformulating hypotheses (Pennycook, 1994).

Paul (2004) believes students, in most educational systems, gain lower order learning which is associative, and rote memorization resulting in misunderstanding, prejudice, and discouragement in which students develop techniques for short term memorization and performance. These techniques block the students' thinking seriously about what they learn.

Unfortunately, the situation in Iran is not different. Teachers, based on traditional teaching, disregard the learners' views and opinions, not giving them the chance to express themselves. Consequently, students do not learn to use their thinking skills.

The issue of incorporating critical thinking skills in education has raised many contradictory ideas about whether critical thinking can be taught or not. A variety of approaches and models to teaching, measuring and assessing critical thinking skills and abilities have been developed. In addition, teaching critical thinking skills has raised many issues such as culture, emotion, transferability and generalizability of the taught skills which are discussed and answered by the experts. Despite all contradictory ideas and beliefs on teaching critical thinking skills, however, everyone agrees that thinking critically is the major goal of education (Reed, 1998).

Traditional beliefs and stereotypes have conclusively suggested that men are superior at analytical thinking, so are better critical thinkers. Scientifically speaking, however, the issue of gender differences in CT has remained an area of controversy among researchers. Some studies reject gender differences on CT

measures and some are in favor of the influential role of gender differences in CT skill. For instance, Kuhn's (1992) findings revealed that argumentative thinking does not differ with sex. Semeric (2010) also reported that the relationships between gender and subdimensions of CT were almost zero. The studies of Myers and Dyer (2006) also confirm this finding. In these two studies, it was found that there were no differences between the CT skills of male and female students (Myers & Dyer, 2006). On the other hand, Simon and Ward's (1974) results indicated that men performed better than women on the Watson-Glaser test, and this was due to their better performance in the subscales of Inference and Evaluation of Arguments.

Since students are not trained as critical thinker in their first language educational system in Iran, providing Iranian EFL learners with a situation to develop CT dispositions is of crucial important. Therefore, it is highly worth to probe whether teaching CT skills could help Iranian EFL learners improve their reading comprehension. To this end the following research questions were posed and investigated in this study:

**RQ1-** Does critical thinking strategies training affect EFL learners' reading comprehension performance?

**RQ2-** Does the effect of critical thinking strategies training vary across different language proficiency level?

**RQ3-** Does the effect of critical thinking strategies training change for male and female students?

## **Method**

### **Participants**

A total of 240 male and female college students of English language and literature took part in this study. The subjects were sophomore students enrolled in reading comprehension II. They were all native speakers of Persian who had 6 years of English instruction prior to their admission to the university. Their ages ranged from 17 to 23, the majority were 19. The study was carried out for 24 sessions in one and a half hours by the researcher (each group had 12 sessions). The subjects were screened into two proficiency levels based on their performance on TOEFL test. Grouping was done based on the dispersion of the TOEFL scores around the mean as experimental and control groups. The students in the experimental group were given training in CT cognitive skills consisting of

eight sessions lasting one and half hours each. Students were required to interpret, analyze, evaluate, infer, explain, and self-regulate the reading passages. The activities and procedures were taken from or adapted from procedures whose works utilized critical thinking (as a research tool) and also the use of critical thinking as an instructional tool (Hannel & Hannel, 1998; Facione 1992; Waters, 2006).

### **Instruments**

To accomplish the task, two sets of reading comprehension test were constructed and utilized as pre-test and post-test. The test included 30 multiple choice items on five passages. It was piloted before using as the assessment tools in the pretest and posttest phase of the study. Moreover, a language proficiency test, TOEFL reading proficiency test (2005 version), was utilized to find out the homogeneity of the groups and to screen the subjects into two language proficiency levels of low and high. In addition, in the task of helping students become critical thinkers, the experimental groups were given training in critical thinking. One of the renowned theory that has been viewed as representative of the educational perspective of critical thinking theory is Bloom's Taxonomy (Vaseghi, Gholami & Barjesteh, 2012). According to Bloom, there are six levels in a successive hierarchy: knowledge, comprehension, application, analysis, synthesis, and evaluation. While the first four levels are understood to be a "true hierarchy", it is possible that levels five and six are equally difficult (Huitt, 1998, p. 2). Critical thinking is likely part of level six, evaluation, as it is this level that "focuses on making an assessment or judgment based on an analysis of a statement or proposition" (Huitt, 1998, p. 2). Bloom's theory has been widely accepted and taught in thinking skill courses in all fields of education programmes. Critical thinking pedagogy always refers to bloom's theory, giving learners practice in some of the lower levels of critical thinking skills before moving them on to the more difficult tasks of the higher thinking processes (Piaw, 2004, as cited in Waters, 2006).

### **Procedures**

In order to investigate the probable effects of critical thinking strategies training on reading comprehension performance of Iranian EFL learners, at first, the subjects were screened into two proficiency levels based on the TOEFL test. Grouping was done based on the dispersion of the TOEFL scores around the mean. Subjects were divided into two low and high proficiency groups. Each proficiency group was divided into critical and non-critical group. Each of the critical and non-critical group was divided into two male and female groups.

The study was run into three phases. In the first phase, all subjects in all eight groups were given a piloted multiple choice test of reading comprehension as the pre-test in order to recognize the subjects' reading comprehension ability before the treatment. To construct the reading comprehension test which was developed by the researchers and used as pretest and posttest, the researchers found the readability of the text to be included in the test through Flesch readability formula. It was done with the word 2007 software and the mean score was calculated. The readability of the text was between 51.5 and 71.5. In order to pilot the test the researchers administered it to a parallel group. The results were then correlated with the TOEFL scores using Pearson Product Moment Correlation coefficient. The reliability of the test calculated through the alpha coefficient was .80. The correlation between the students' scores on the reading comprehension test and that of TOEFL was .98 indicating a high correlation related type of validity. In the second phase, the students in the experimental group were given training in CT cognitive skills consisting of eight sessions lasting one and half hours each. The activities and procedures were taken from or adapted from procedures whose works utilized critical thinking (as a research tool) and also the use of critical thinking as an instructional tool (Hannel & Hannel, 1998; Facione, 1992; Waters, 2006). The students in the control groups followed the conventional method for reading comprehension. The passages were taken from the reading comprehension book "Mosaic 1" 4<sup>th</sup> edition. In the experimental group the students were taught CT cognitive skills and sub skills based on Bloom's Taxonomy (Vaseghi, Gholami & Barjesteh, 2012).

The CT Cognitive Skills include the ability to select a topic sentence, invent a topic sentence if it was implied, find the main idea and overall themes/relationship, summarize and paraphrase a text, justify a procedure and present argument, identify or draw a conclusion, identify the irrelevance sentences, formulate a question, keep the situation in mind, recall the information and make judgment, infer an idea in the passage, interpret and generalize facts, ask and answer questions of clarification and/or challenge the meaning. In the third phase of the study, the subjects were given the post-test in order to recognize the subjects' reading comprehension ability after treatment. After collecting data, the scores for each participant were tabulated and subjected to statistical analyses in order to provide answers to the research questions.

## **Results**

In order to fulfill the purpose of the study, three tests were administered: The first one was TOEFL, the results of which were used to screen the subjects into two high and low groups on the basis of the dispersion of scores around the mean.

The next two tests were reading comprehension tests validated against the reading comprehension test in the pilot study.

Initially, descriptive statistics were carried out for reading comprehension tests involved in this study. The results are reported in Table 1 below.

Table 1

*Descriptive statistics for reading comprehension tests*

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance	
					Std. Error			
Pretest	240	60	30	90	62.41	1.26	19.53	381.71
Post test	240	79	21	100	61.38	1.49	23.10	533.77
Valid N (list wise)	240							

Based on the research questions and null hypotheses in this study, several statistical analyses were conducted, the results of which are presented below. At first participants were grouped into two levels (high & low) according to their TOEFL scores. Each proficiency group was further divided two critical and non-critical group. In addition, we had equal number of male and female in each group. In other words, we had eight groups (high/low) (male/female) (critical/non-critical).

As it was mentioned before, the study was run into three phases. In the first phase all subject in all eight groups were given the pre-test in order to recognize the subjects reading comprehension ability and also the possible differences among all eight groups before the treatment. After scoring the pre-test, the scores were tabulated and subjected to statistical analyses of two-way ANOVA.

Table 2

*Tests of between-subjects effects for pretest*

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected model	83697.017a	3	27899.006	874.047	.000
Intercept	934752.017	1	934752.17	29284.807	.000
Proficiency	83477.400	1	83477.400	2615.260	.000
Gender	198.017	1	198.017	6.204	.513
Proficiency * Gender	21.600	1	21.600	.677	.412
Error	7532.967	236	31.919		
Total	1025982.000	240			
Corrected Total	91229.983	239			
a R Squared = .917(Adjusted R Squared = .916)					

Note the sig. (i.e., p-value) for each F ratio. There is a significant main effect for "proficiency", but the main effect for "Gender" is not significant. In other words, there is a significant and meaningful difference between high/low groups, but there is no difference between male/female groups. In addition there is not a significant interaction between "proficiency" and "Gender" meaning that the proficiency factor has the same effects upon male and female groups.

Then, subjects in critical groups had critical thinking training. Subjects in non-critical groups used a more traditional approach for reading comprehension. In the third phase of the study, the subjects were given the post-test in order to recognize the subjects' reading comprehension ability and also the possible differences among all eight groups after the treatment. After scoring the post-test, the scores were tabulated and subjected to statistical analyses of three ways ANOVA (Table 3).

Table 3

*Tests of between-subjects effects for posttest*

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	125667.533	7	17952.505	2186.112	.000
Intercept	904299.267	1	904299.267	110118.32	.000
Proficiency	24888.067	1	24888.067	3030.669	.000
Gender	6406.667	1	6406.667	780.153	.000
Critical	94327.350	1	94327.350	11486.429	.000
Proficiency * Gender	.600	1	.600	.073	.787
Proficiency * Critical	12.150	1	12.150	1.480	.225
Gender * Critical	25.350	1	25.350	3.0873	.080
Proficiency * Gender Critical	7.350	1	7.350	.895	.345
Error	1905.200	2322	8.212		
Total	1031872.000	2402			
Corrected Total	127572.733	2392			
a R Squared = .985 (Adjusted R Squared =.985)					

Note the sig. (i.e., p-value) for each F ratio. There are significant main effect for "critical", "proficiency", and "gender" factors. All three factors are significant beyond .01 level. Despite the main effects of the factors, there are no significant interactions. Clearly, the "critical" factor has the same effects upon high/low and male/female groups. As Table 4 illustrates there is a significant difference between critical and non-critical groups. These results reject the first null hypothesis and confirm the effect of critical thinking training on the EFL

learners' reading comprehension performance. There is also a significant difference between high and low proficiency groups. However, the interaction between "critical" factor and "proficiency" factor was not significant. So the second null hypothesis is supported, i.e., the effect of critical thinking training does not vary across different language proficiency levels. There was a significant difference between male and female groups, but the interaction between "critical" factor and "gender" factor was not significant. So the third null hypothesis is also supported i.e., the effect of critical thinking training does not vary for male and female students.

### **Discussion**

The primary purpose of this study was to examine the effects of CT strategies training on EFL learners' reading comprehension performance. The researcher of the present study set out to investigate such effects based on CT strategies followed from the theoretical and empirical studies in the literature that indicated the positive effect of CT training on EFL learners' reading comprehension performance.

To support the result in terms of the first question that proves the impact of teaching critical thinking skills on reading comprehension it is necessary to state the views of some cognitive experts regarding these two variables. Some of the mental skills employed in reading comprehension, as Celce-Murcia (2001) quotes Grabe (1991), are inference, synthesis, analysis, and evaluation which are what experts include as being at the very core of critical thinking. "As to the cognitive skills here is what experts include as being at the very core of critical thinking: interpretation, analysis, evaluation, inference, explanation, and self-regulation" (Facione, 1992, p. 4).

In this regard, taking the definition of reading comprehension by Durkin (1993), "intentional thinking during which meaning is constructed through interactions between text and reader", this construction of meaning during reading is "a complex merger of skills, prior knowledge and text mediated by the language skills, motivation and interest of the reader" (Renandya, 2002; Cambourne, 2002, as cited in Robinson, 2006, p. 32), which according to Sweet and Snow (2002, as cited in Robinson, 2006, p. 32) "covers the full spectrum of Bloom's taxonomy in critical thinking including knowing facts, understanding concepts, application, analysis, synthesis, and evaluation". Thus the above claim has been crystallized in the significant improvement of experimental group in reading comprehension. As it can be seen critical thinking and comprehension both are cognitive abilities having cognitive skills in common so that improving

the first can contribute to the improvement of the other—reading comprehension. This supports the purpose of the study that teaching critical thinking skills has a positive effect on reading comprehension

The results of the present study verified the researchers' contention. The finding indicated that using CT strategies help students to identify, clarify, evaluate, infer, and solve perplexities that arise in reading. Indeed researchers agree that problem solving, creativity and imagination of one's comprehension processes are critically important aspects of skilled reading. Such creativity and imagination are what often referred to in the literature as critical thinking. This is in line with theoretical contentions which indicate CT can be taught as a process of thinking without a single solution to a problem determining the value of an idea, making judgment about truthfulness of the statement or answers to a problem (Stancto, 2000; Waters, 2006; Birjandi & Bagherkazemi, 2010).

The second research question aimed at investigating the effect of CT strategies training across different language proficiency levels. The finding illustrated the intended moderator had not a significant impact on language proficiency levels. This suggests that a learners CT ability dose not vary across different language proficiency levels.

The researcher's third question investigated the relationship between gender and CT. The result indicated that there was no difference between males and females in using their CT abilities, and females got the same scores as the males. This is in accordance with findings of Kuhn (1992), Semeric (2010), and Myers and Drey (2006). This can be explained in the view of the fact that the modern life has taught both females and males to have almost identical level of CT and to get through everyday difficulties by applying their CT skills regardless of their sex. This is more evident in academic settings, especially university context, where developing higher order thinking abilities such as CT is an indispensable part of the agenda of higher education for all students irrespective of their gender, major, nationality, race and so on.

### **Conclusion**

The prominent pedagogical implications in this research correspond with what the following scholar believes in. Waters (2006) persuaded that applying and using critical thinking activities that different levels of language proficiency in English language classrooms can increase learners' level of thinking and simultaneously they help language learners to grasp the main meaning of the text. Critical thinking activities, as Waters believe, can equip learners with instruments

which help them "stay with" or "go beyond" the information presented in a text. That is why they can have a practical application of learning in a closely integrated manner.

The researchers tried to provide learners with particular activities which are not only linguistically manageable but also cognitively challenging. This is because such learners may feel reduce to a state of psychological infancy by the way their means of self-expression (cf., Stevick, 1996). That is why the researchers provide the learners with a lot of opportunities to use their normal critical thinking abilities as much as possible in the course of their language learning experiences, in order to foster a healthier, more adult psychological frame of mind; as the philosopher Descartes famously said, "I think therefore I am". By virtue of the acquired results in this study and researchers' observations, educational authorities are required to train language instructors so that they might be able to avail themselves of critical thinking strategies in reading comprehension class and do not resort to traditional strategies of teaching passages for reading comprehension.

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