

# Investigating the Relationship between Critical Thinking Skills and the Quality of Iranian Intermediate TEFL Students' Writing

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## Abstract

The current study intended to find out the relationship between critical thinking skills and the quality of Iranian TEFL (Teaching English as a Foreign Language) students' writing. One-hundred forty students who were homogeneous in their language proficiency were selected non-randomly. The researcher asked students to take part in a proficiency test named Nelson test (intermediate 200B) and she chose students whose level was intermediate as participants of the study. This study was an associational (correlational) study. To achieve the goal of the study California Critical Thinking Test (form B) was administered among intermediate students to measure students' critical thinking skills (analysis, evaluation, inference). Then the researcher asked the participants to write on a given topic and their writings were rated by two language teachers by following the rules of scoring in Quellmaz's scale. The inter-rater correlation across all papers calculated in order to be sure about the objectivity and reliability of scores. The Pearson-Product Moment was used to examine the relationship between variables, furthermore multiple regressions was applied to predict the degree of their relationship. The results of the study revealed that there is a positive relationship between critical thinking skills and writing quality. Furthermore, it was proved that evaluation has the strongest degree of relationship with the quality of writing.

**Keywords:** Critical thinking, analysis, evaluation, inference, writing quality

## 1. Introduction

"Everyone thinks. But much of our thinking, left to itself, is biased, distorted, partial, uninformed or down-right prejudiced." (Paul & Elder, 2002, p.15). The quality of our life can be guaranteed by the quality of our thinking. We should be aware of our thinking process and we should systematically improve it (Paul, Binker, Jensen & Kreklau, 1990). Thinking and learning new information are important features of human beings throughout their life. So, thinking should be the most dominant factor in any education system because it provides the base for inventions and leads to human growth and development. The importance of critical thinking as an educational goal has been acknowledged by different educators. Piaget (1958, cited in Fisher, 2001) emphasizes the vitality of students' critical thinking in his identification of the goal of education: "To create men who are capable of doing new things rather than repeating what the previous generations have already done, and to form minds which can think critically, and verify rather than passively accepting everything offered" (p. 22).

Furthermore, what distinguishes a human from a nonhuman is the ability of the former to reason and communicate. And what distinguishes a literate person from an illiterate one is the capability of the former to read and write. Also, Kellogg (2001) claimed that writing academically is a main cognitive challenge, because it is a test of memory, language, and thinking ability and requires fast retrieval of domain-specific knowledge about the topic from long-term memory. But, even higher education students have difficulty constructing an argument and applying critical analysis in their written assignments and the existence of time limitation in EFL classes makes it somehow impossible to educators to work on all sub-skills of critical thinking in order to help learners to have a better writing. For these things, there is a need to investigate the relationships between critical thinking skills and writing quality and decide which skills have important role and priority in a good writing.

## 2. Review of Literature

### 2.1 The Etymology of Critical Thinking

In order to clarify the meaning of the term “critical thinking”, it should be broken down into its constituent. Elder and Paul (2009) elaborated the term critical thinking in the best way. They claimed that the word “critical” derives from the ancient Greek “kritikos” and it means discerning judgment and also “kriterion” which means standards, thus implying the development of “discerning judgment based on standards”. As a whole, educational reformer have not achieved an agreement on the terminology, some scholars use “critical thinking” and “higher order thinking” interchangeably like Halpern (1993), others make a sharp distinction like Facione (1990).

### 2.2 Definitions of Critical Thinking

Attempts to define the critical thinking began over 100 years ago and its meaning has evolved since then and a review of literature in the field of critical thinking makes it clear that there is a general lack of consensus on how critical thinking can be best defined. But what is the reason behind the lack of unique definition of the term? Critical thinking is also open to definitions from multiple perspectives: philosophical, psychological and educational. Some definitions are broad and some others are narrow. Reed and Kromrey (2001) cited that

Philosophers have tended to focus on the nature and quality of the products of critical thinking, for example analysis of arguments. Psychologists, on the other hand, have concentrated on the process of cognition, the components and operations used to address academic and practical problems.

Definitions of critical thinking from the philosophical viewpoint include:

- “The propensity and skill to engage in an activity with reflective skepticism” (McPeck, 1981, p.8);
- “Reflective and reasonable thinking that is focused on deciding what to believe or do” (Ennis, 1985, p. 45);
- “Skillful, responsible thinking that facilitates good judgment because it 1) relies upon criteria, 2) is self-correcting, and 3) is sensitive to context” (Lipman, 1988, p. 39).

Definitions of critical thinking from the cognitive psychological approach include:

- “The mental processes, strategies, and representations people use to solve problems, make decisions, and learn new concepts” (Sternberg, 1986, p. 3);
- “The use of those cognitive skills or strategies that increase the probability of a desirable outcome” (Halpern, 1998, p. 450).

### 2.3 Attempts at Posing a Unified Definition of Critical Thinking

Skills and dispositions drawn up by different philosophers and psychologists have many ideas and factors in common and these areas for agreement lead the scholars to propose a unified definition to critical thinking. In 1988, American Philosophical Association conducted a national Delphi study to develop a unified definition to critical thinking (Facione, 1990). The Delphi Report identified critical thinking as “one among a family of closely related forms of higher-order thinking, along with, for example, problem solving, decision making, and creative thinking” (Facione, 1990, p. 13). According to Facione (1990) the experts’ consensus statement on critical thinking is:

We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based. Critical thinking is essential as a tool of inquiry. As such, critical thinking is a liberating force in education and a powerful resource in one’s personal and civic life. While not synonymous with good thinking, critical thinking is a pervasive and self-rectifying human phenomenon. The ideal critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit. Thus, educating good critical thinkers means working toward this ideal. It combines developing critical thinking skills with nurturing those dispositions which consistently yield useful insights and which are the basis of a rational and democratic society (p.2).

### 2.4 Writing and Thinking

Not only do the students need to have a good command of the language, they also need to be critical as they examine viewpoints, facts and arguments and synthesize them. Kellogg (2001) believes that an outstanding writing demands a fast retrieval of domain-specific knowledge about the topic from long-term memory and it is a test of memory, language, and thinking ability simultaneously. Furthermore, other scholars claimed that writing ability depends on the ability to think clearly about substantive matters (Nickerson, Perkins, & Smith, 1985). So, writing skills are invariably dependent on clarity of thought. Moreover, Marzano (1991) suggested that “writing used as a mean to restructure knowledge, improves higher-order thinking and in this context, writing may provide opportunity for students to think through arguments and use higher-order thinking skills to respond to complex problems” (p.521). Thus, among

language skills 'writing' is the most important one in relation to critical thinking and there is a need for further research in this field.

### 2.5 Review of Related Studies

Many studies have conducted to study about critical thinking in the ESL and EFL learning area in Iran and other countries. This part will refer to some of them:

Ghazi Mir-Saeed and Roustaa (2013) explored the effect of problem-based learning method on critical thinking ability of Iranian EFL students. They claimed that problem-based learning is a useful method to encourage the skills students need to succeed. In this study, it was hypothesized that problem-based learning can have result on critical thinking ability of Iranian EFL students. The data was obtained from the students of Dorsa language institute located in Hashtgerd, Alborz province. 71 students took part in a language proficiency test (PET) in order to have homogenised subjects. As a result of test, 40 students were selected. Then the subjects completed a critical thinking questionnaire and they were divided into one experimental and one control group based on their language proficiency scores. After sixteen sessions of problem-based instruction, the researcher administrated the post-tests to both experimental and control groups. The results of the data analysis proved that doing problem-based activities improved critical thinking ability of the subjects. The findings of this study revealed that attending in problem-based learning class had a significant effect on EFL learners' critical thinking ability.

Hosseini, Khodaei, Sarfallah and Dolatabadi (2012) conducted a study to find out the relationship of critical thinking ability, reading comprehension and reading strategy use among 70 male and female Iranian university students. The majors of subjects in this study were English Translation and English Literature. Three instruments, the TOEFL (Test of English as a Foreign Language) reading comprehension test, a critical thinking ability test and Reading Strategy Inventory, used to collect data in this study. The findings showed that there was a significant positive relationship between Iranian English as a Foreign Language (EFL) readers' critical thinking ability and reading strategy use, in general and metacognitive and cognitive reading strategy use, in particular. Moreover, a significant positive relationship was found between critical thinking and reading compensation. The results also proved that cognitive and affective strategies along with critical thinking ability are the best predictors of reading comprehension.

Ghaemi and Taherian (2011) examined the relationship between EFL teachers' critical thinking and their teaching success. The purpose of this study was to find out whether critical thinking ability has any significant relationship with teaching success or not. Two instruments, including "Watson Glazer Critical Thinking Questionnaire" and "Characteristics of Successful EFL Teachers", were used to collect data to carry out the study. The researchers asked at least 70 EFL teachers in Mashhad, Iran to answer the critical thinking questionnaire and their students were asked to complete a questionnaire to evaluate their teachers' performance. The results showed that there is a significant relationship between EFL teachers' critical thinking and their teaching success.

### 3. Methodology

The previous part gave an overview of the literature related to critical thinking skills and writing that are independent and dependent variables of this study respectively. Now, some concepts related to methodology such as design of study, research questions and hypothesis, participants, instruments and procedure will be discussed.

#### 3.1 Design of Study

This study is a primary research because the data is derived from primary source (e.g., students who are studying TEFL at university). Among types of research (qualitative and quantitative), this research is quantitative one as the research questions were arrived deductively, the researcher started her work by posing some hypotheses, and numerical indices derived from tests used through statistical analysis to test the hypotheses. This study involved three independent variables including evaluation, analysis and inference. These skills are sub-skills of critical thinking ability. The dependent variable of the study is writing quality. The variables examined by answering the following research questions:

1. Is there any significant relationship between the quality of writing and critical thinking in terms of analysis skill?
2. Is there any significant relationship between the quality of writing and critical thinking in terms of inference skill?
3. Is there any significant relationship between the quality of writing and critical thinking in terms of evaluation skill?

Furthermore, this study is intended to work on the following null hypotheses:

H01: There is not any significant relationship the quality of writing and critical thinking in terms of analysis skill.

H02: There is not any significant relationship between the quality of writing and critical thinking in terms of inference skill.

H03: There is not any significant relationship between the quality of writing and critical thinking in terms of evaluation skill.

#### 3.2 Participants

The researcher was able to access Iranian university students; both female and male who were studying in TEFL at the University of Foreign Languages who willingly agreed to take part in the study. 180 participants selected randomly to took the placement test and for the purpose of study 140 intermediate individuals were selected. So, they were homogeneous in terms of the language proficiency level. The demographic characteristics of participants indicated that

there were 102 female and 38 male students (72.9 percent and 27.1 percent respectively) as subjects in the study. Gender was not considered as a moderator variable in this study, so its potential influence on the results has not been separately taken in to consideration.

### 3.3 Material

To accomplish the purpose of the research, three instruments including placement test, California critical thinking test form B, analytic-holistic scale for assessing writing were used in the study that they will be discussed in the following paragraphs.

- **Proficiency test**

Proficiency test used in this study included the Nelson Test (intermediate 200B). The aim of this test was to ensure that subjects are homogenized in terms of their English language proficiency.

- **California Critical Thinking Ability Test**

The survey instrument used in this study for data collection was the California Critical Thinking Skills Test developed in 1990 by Peter Facione and published by California Academic Press. Facione (1990) authored both the definitions published by the APA as well as the California Critical Thinking Skills Test (CCTST) emerged from the work of the Delphi Project (1990), thereby ensuring that the test is measuring what is intended to measure (content validity). In this study, the CCTST was selected for use due to its corresponding relationship with the definitions for “critical thinking skills” employed here. So, the selected definition and corresponding instrument are consistent with the purposes of this study.

In order to be sure about the reliability and validity of the Persian form of CCTST Form (B) in this research setting, the researcher piloted it among 30 intermediate TEFL students and the data were analysed by SPSS 18 software. The results showed that Persian version of the test enjoyed the acceptable level of validity. The Cronbach alpha statistical analysis was carried out in the pilot study to determine the reliability. The results showed that Cronbach alpha for total scale with 34 items was 0.79 that is acceptable for this study. Subscale analysis showed a positive level of correlation between total test score and the components (analysis,  $\alpha = 0.80$ ; evaluation,  $\alpha = 0.76$ ; inference,  $\alpha = 0.76$ ).

- **Scale for assessing writing**

The scale for evaluating expository writing developed by Quellmalz (1982) was used as a base in rating students' writing. This is a holistic-analytic instrument that has six-point scales for assessing four dimensions of writing competence, focus/organization, support and mechanics. Thus, the total score for the Scale (six points for each of the four dimensions) will amount to 24.

### 3.4 Procedure

In order to achieve the purpose of the research, the following procedures were followed. First, the researcher attended eight randomly selected TEFL classes and asked the students to take part in her study and then the Nelson test (intermediate 200B) ran to select homogeneous intermediate students. The students whose scores were around the mean were selected as the study population. Second, in another session the California critical thinking test form (B) was administered among all intermediate students to fill it out. 45 minutes were given to them to do this. Moreover the researcher presents while participants responding to the questionnaire to provide further explanations when required. Third, some sessions later the researcher asked the participants to write on an expository topic in the class: *Think about your favourite year of school. Explain why it was your favourite year.* (Please use 250 or more words). Then, participants' scores of critical thinking skills were obtained and the students' writings rated by two raters in terms of their quality and frequency. The inter-rater correlation coefficient across all papers calculated in order to be sure about the objectivity and reliability of scores. Contingency Coefficient Product Moment Correlation coefficient between two sets of scores for writing quality was determined as 0/932 and in could be concluded that the two sets of scores given by two raters enjoyed high degree of correlation. Finally, data were analysed by a statistician through SPSS 18 software in order to answer the research questions.

## 4. Data Analysis and Results

This part includes three sub-sections. First, correlation coefficient between two sets of scores, given by two language teachers to participant's writing, will be examined. Then the results of inferential statistics will be discussed to answer the research questions and finally a model will be posed to summarize the results of multiple regressions.

In this study the quality of students' writings on an expository topic were scored by two English language teachers. In order to be sure about the objectivity and reliability between two sets of scores, it was necessary to measure the correlation coefficient between them. The correlation coefficient of two sets of scores was calculated by a statistician. The result is presented in the following table.

Table 4.1 Contingency Coefficient Product Moment Correlation coefficient

Writing Quality 1	Contingency Coefficient	Writing Quality 2
		.932
	Sig. (2-tailed)	.000
	N	140

Based on the data in table 4.1, we can see that the correlation coefficient is 0.93 and the significance level of difference is lower than 0.05 and these numerical indices show that there is a strong relationship between two sets of given scores for writing quality and there is a very little difference between them.

For the purpose of this study it is needed to use inferential statistics which involves procedures that permit a researcher to make tentative generalizations from sample data to the population from which the sample was drawn. Pearson product moment coefficient (Pearson r) at a 0.05 level of significance was used as a formula to test whether or not there is a relationship between two sets of scores.

**H01: There is not any significant relationship the quality of writing and critical thinking in terms of analysis skill.**

Table 4.2 Pearson Product Moment Correlation Coefficient between Writing Quality and Analysis

Writing Quality	Pearson Correlation	analysis
	Sig. (2-tailed)	.619
	N	140

According to Table (4.2), it is seen that the correlation between two variables is ( $r = +0.619$ ) with the significance level of ( $p= 0.000$ ). Because the significance level is lower than 0.05, there exists a positive correlation between writing quality and analysis.

**H02: There is not any significant relationship between the quality of writing and critical thinking in terms of inference skill.**

Table 4.3 Pearson Product Moment Correlation Coefficient between Writing Quality and Inference

Writing Quality	Pearson Correlation	Inference
	Sig. (2-tailed)	.597**
	N	140

According to Table (4.3), it is seen that the correlation between two variables is ( $r= +0.597$ ) with the significance level of ( $p= 0.000$ ). Because the significance level is lower than 0.05, there exists a positive correlation between writing quality and inference.

**H03: There is not any significant relationship between the quality of writing and critical thinking in terms of evaluation skill.**

Table 4.4 Pearson Product Moment Correlation coefficient between Writing Quality and Evaluation

Writing frequency	Pearson Correlation	Inference
	Sig. (2-tailed)	.587**
	N	140

According to Table (4.4), it is seen that the correlation between two variables is ( $r= +0.713$ ) with the significance level of ( $p= 0.000$ ). Because the significance level is lower than 0.05, there exists a positive correlation between writing quality and evaluation.

As the final stage of data analysis multiple regressions were run in this study in order to predict the extent which critical thinking skills correlates with the quality of writing. All independent variables (analysis, inference, evaluation) were entered into the multiple regressions equation and following model obtained from it:

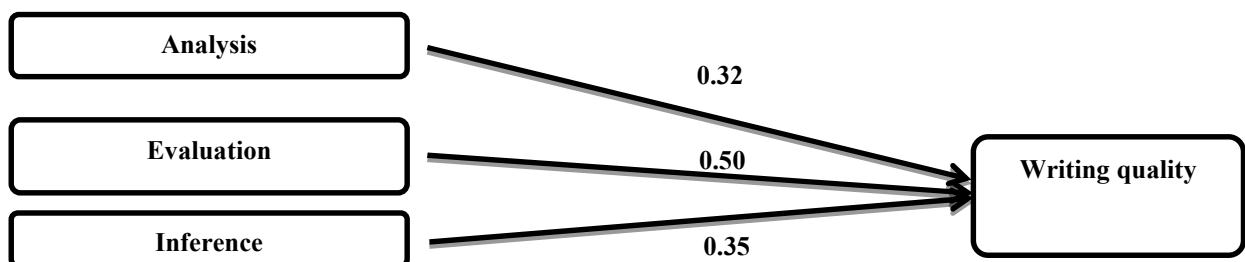


Figure 1. Degree of relationship between critical skills and writing quality

Through inferential statistics it was identified that there was a positive relationship between critical thinking skills and the quality of writing. As a result of multiple regressions, the degree of relationship between critical thinking skills, including analysis, evaluation, inference and the quality of writing was determined. So, the degree of relationship between independent variables and writing quality can be best summarized in the following way:

- ⇒ Analysis has 0.32 degree of relationship with the quality of Intermediate EFL students' writing.
- ⇒ Evaluation has 0.50 degree of relationship with the quality of Intermediate EFL students' writing.
- ⇒ Inference has 0.35 degree of relationship with the quality of Intermediate EFL students' writing.

## 5. Discussions of Findings

### 5.1 Discussion Related to First Research Question

The first research question asked whether there is any significant relationship between the quality of writing and critical thinking in terms of analysis skill. To investigate this, the Pearson Product-moment correlation coefficient was run. The findings revealed that correlation between analysis skill and writing quality is ( $r = +0.619$ ) with the significance level of ( $p = 0.000$ ). According to these numerical data, it can be concluded that there is a positive correlation between analysis skill and writing quality. Now it is clear that there is a significant relationship between analysis and the quality of writing. But we need to predict the degree of relationship between these variables. To achieve this, multiple regressions were run and the results indicated that the degree of relationship between analysis and dependent variable (writing quality) is 0.32. The results related to first research question is in line with the results of Mohammadi, Heidari and Niry (2012). They found that there was a positive correlation between metacognitive strategy use and the reading comprehension of Iranian EFL learners. In addition, there was a positive significant correlation between learners' critical thinking ability and their overall use of metacognitive reading strategies. According to findings of their study, it can be argued that the results of the present study supported their study, since the skill of 'analysis' is regarded to be a kind of meta-cognitive strategy and a critical thinking skill for learning (Brown, 2007), and in this study the results revealed that there was a significant relationship between analysis and the quality of writing. Moreover, findings of this study are similar in part to results found in a study conducted by Babalhavaeji and Ghiasi (2011) using 138 samples out of 521 research-compiled articles published in Persian nucleus journals in library-information science from 1997- 2007. The purpose of their study was specifying authors' use of "analysis" as a critical thinking factor in the studied articles. Their study showed that analysis has the highest percentage (60.1%) at the excellent rate. It can be argued that the academic writers use their analysis skill to write high quality writing and it was supported by the results of this study.

### 5.2 Discussion Related to Second Research Question

To investigate the second research question, whether there is any significant relationship between the quality of writing and critical thinking in terms of inference skill, the Pearson Product-moment correlation coefficient was run. The results revealed that the correlation between writing quality and inference is ( $r = +0.597$ ) with the significance level of ( $p = 0.000$ ). These data show that there exists a positive correlation between writing quality and Inference. To know about the degree of this relationship multiple regressions were run. The results showed that the degree of relationship between inference and dependent variable (writing quality) is 0.35. The results of the present study regarding the second research question seem to support the results of the study by Boloori and Naghipoor (2010) in which the researchers argued that, there was a strong positive relationship between critical thinking, and the learners' performance on translation tests. Translation as a highly specific task is regarded to be dependent on the learners' inference ability (Brown, 2007), and inference is regarded to be a critical thinking skill. Therefore, it can be argued that in both of these studies there was a positive relationship between inference (a critical thinking skill) and EFL learners' performance. Furthermore, there is a study conducted by Babalhavaeji and Ghiasi (2011) which supports this study. Babalhavaeji and Ghiasi (2011) examined authors' use of "inference" as a critical thinking factor in the articles published in Persian nucleus journals in library-information science from 1997- 2007. The results of their study confirmed that inference has 37.5% rate for the good writing. It can be concluded that they found positive relationship between writing and inference in the same line with this study.

### 5.3 Discussion Related to Third Research Question

To investigate the third research question, whether there is any significant relationship between the quality of writing and critical thinking in terms of evaluation skill the Pearson Product-moment correlation coefficient was run. The results indicated that correlation between writing quality and evaluation is ( $r = +0.713$ ) with the significance level of ( $p = 0.000$ ). As these numerical data show there exist a positive correlation between writing quality and evaluation. Multiple regressions were run to determine the degree of above mentioned relationship. The results obtained from regression model indicated that the degree of relationship between evaluation and dependent variable (writing quality) is 0.50. Mohammadi, Heidari and Niry (2012) argued that, the most frequently used reading strategies by Iranian EFL learners were meta-cognitive strategies and also there was a positive significant correlation between learners' critical thinking ability and their overall use of meta-cognitive reading strategies. Evaluation is considered to be one of the most effective meta-cognitive strategies and a critical thinking skill employed for learning (Brown, 2007). Therefore, it can be concluded that in of both of these studies there was a positive relationship between evaluation (a critical thinking skill and a metacognitive strategy) and the EFL learners' performance on the language skills. Moreover, there is a study conducted by Quitadamo and Kurtz (2007) which is somehow in contrast with this study. The purpose of their study was to discover whether writing could measurably influence critical thinking performance in general education biology. Results indicated that students from the writing group significantly outperformed their non-writing peers in both total critical thinking skills. The analysis of component skills elaborated that writing students significantly improved their analysis and inference skills whereas non-writing students did not. Also, writing students showed greater gains in

evaluation skills; however, these were not significant. Here the findings showed that evaluation had the greatest degree of relationship with writing quality.

## 6. Conclusion

The purpose of this study was to investigate the relationship between the sub-skills of critical thinking with the quality of writing. The research was carried out as a correlational research among intermediate TEFL students in Iran. In the review of the literature it was determined that having critical thinking skill has necessity in this modern world because changes occur very fast and we need to have critical thinking ability to decide and adapt ourselves. Importance of critical thinking in education cannot be ignored. Many studies were conducted to determine the effect and relationship of critical thinking with different areas of language. In this study, we attempted to identify the relationship between the sub-skills of critical thinking (analysis, evaluation, inference) with the quality of writing.

To answer the research questions, product-moment correlation coefficient was run and the findings revealed that critical thinking skills including analysis, evaluation, and inference have positive relationship with the quality of writing. So, it is necessary in writing courses to practice on students' critical thinking skills in order to provide a writing class with high quality. Furthermore, the results of data analysis showed that all of the critical thinking skills do not have same degree of relationship with writing quality and according to multiple regression model, evaluation skill has the strongest relationship with writing quality.

Based on the findings of the study, the researcher suggests that syllabus designers and material developers of writing course books should see critical thinking as one of the effective elements in both academic and future career success. Incorporating critical thinking in course books results in educated intellectual students with analytical abilities. But this study suffers from some limitations. First, because the researcher could not have any classes at the university level, she was not able to conduct an experimental research to find out the effect of critical thinking skills on the quality of writing. Moreover, in this study we did not consider gender as a variable but it may have effect on the results. Therefore, other researchers can conduct the experimental form of this study by having control and experimental group and gender can be considered as moderator variable in order to control its effect on the results of the study.

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