

# Studying the Relationship between Critical Thinking Skills and Students' Educational Achievement (Eghlid Universities as Case Study)

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## ABSTRACT

In today's complex world, several changes are occurring. Also there is an intensive competition among societies in achieving advanced technologies. In this regard, societies and individuals are forced to attempt in achieving it. Education is an important issue in this area, as students cannot be passive in 21th century. This is why that final and quantitative goal of education should be changed and critical thinking should be considered as one of the inevitable goals of education. Education of critical thinking may results in new technologies that its goal is making people health not making them destructive. the present study is a descriptive-correlation research. In such studies, the author attempts to examine type and degree of the relationship between variables. Generally, there are several factors influencing students' educational achievement. The authors of this study have attempted to examine the relationship between teachers' critical thinking and students' educational achievement. This study has been done in the universities of Eghlid city. A sample of 130 students has been selected from this population randomly. The respondents were asked to answer the questionnaire. In order to collect the research data, critical thinking questionnaire has been used. Correlation coefficient method has been used for analyzing the research data and testing the research hypotheses in the SPSS. The results of this study revealed that there is a significant relationship between teachers' critical thinking and students' educational achievement ( $p \leq 0/05$ ). Another part of the results indicated that there is not any significant difference between male and female students in terms of critical thinking.

**Keywords:** Critical Thinking; Educational Achievement; Students

## 1. INTRODUCTION

Nowadays, western world pays attention to the education of thinking, methods of thinking, and relying on the memories which attempt to change learning trend. If we see and analyze educational methods of our country, we will understand that our educational methods are based on the teacher-oriented methods and the learners only memorize educational contents in short-term and then forget them in long-term. Since the ancient educational methods are famous in Iran and this method has made a passive educational method, the students and other learners have learned passive educational methods. Indeed, they have not any active role and freedom in such a method (Shariatmadari, 1995).

Based on this fact that training is one of the main fundamentals of change and revolution in every society, appropriate training can be effective in producing sciences, innovations, and educational achievement. On the other hand, inappropriate training methods lead to destroy competencies and also block active and critical thinking (Sane, 2010). Indeed, studying thinking capability is one of the main goals of education. Generally, theorists and thinkers of training issues refer that critical thinking consists of three parts including analysis, evaluation, and inference (Pawl, 1993). Indeed, critical thinking refers to the capabilities and competencies of analyzing a problem or condition in order to integrate all of the existing information about interested issue and achieve a reasonable answer or hypothesis (Warnick et al., 1994). It should be remembered that critical thinking examines hypotheses, understands implicit values, evaluate subjects, and measure conclusions (Petress, 2004). Ennis (1991) believes that critical thinking includes deciding on what should be done? And what should be believed?

Undoubtedly, school plays an important role in educating active people. It is an operational unit in the educational system that can reinforce students' thinking competency and conceptual skills so much that they will be able to create new methods for achieving their goals. As a result, their skills will be developed and they can be used in the social life. Students usually attempt in their educational activities, but their efforts are not sufficient and are less than their actual abilities and capabilities. Indeed, growth and development of students' intellectual skills is an important and complex issue. In today's world, several social and cultural changes and revolutions have created many challenges in education. For example, academic failure, drop in learning quality, and inappropriate educational contents, lack of application of learned contents in the personal experiences are the main disadvantages of this system. With respect to the important role of educational environments and its methods, such environments should be designed so exactly that involves students in the real experiences. Critical thinking is one of the most important methods of creativity-seeking among students. Indeed, critical thinking has been started by scientists such as Socrate, Aquinas, Erasmus, Moore, Bacon, Newton, and Kant. However, new approach of critical thinking has been started from 1945. Indeed, students' interest and motivation are two main factors which pave the ground for critical thinking (Nasrabadi et al., 1997), (Yarmohamadzade et al., 2013).

Now, this question should be answered that "what is the effect of critical thinking on our academic achievement?" the term "academic achievement" refers to upward progress. From theoretical perspective, the term refers to the students' average scores in achieving predetermined purposes from present condition toward ideal one. There are several effective factors on the students' academic achievement. Critical thinking is one of the important effective factors on the academic achievement. Indeed, learners with critical thinking learn many abilities and competencies which improve their effectiveness. As a result, this factor results in the learners' success (Yarmohamadzade et al., 2013), (Nasrabadi et al., 1997). With regard to the reviews and conscious visions about critical thinking as the main fundamental and basis of scientific, political, and economic academic achievement, the purpose of this study is to investigate the relationship between critical thinking and academic achievement. Ghasemi Pirbaloti (2011) studies the relationship between academic achievement and male and female students' source of control. The results of this study revealed that there is a significant relationship between academic achievement and male and female students' source of control. Keramatinejhad (2012) studies the relationship between source of control and academic achievement among high school students in the city of Ghom. The results of this study revealed that there is not any significant difference between male and female students' source of control. Also the results showed that there is a significant positive relationship between students' source

of control and academic achievement. In other words, as much as the students have internal source of control, their academic achievement will be increased.

## 2. RESEARCH METHODOLOGY

This study is a descriptive-correlational research.

**Table 1.** The respondents' gender characteristics.

| Gender | Frequency | %   |
|--------|-----------|-----|
| Male   | 65        | 50  |
| Female | 65        | 50  |
| Sum    | 130       | 100 |

### 2. 1. Statistical population and sample

The statistical population of this study includes all of the students of universities in the city of Eghlid in 2012 and 2013. A sample of 130 students has been selected from this population randomly.

### 2. 2. Measurement instruments

In order to collect the research data of critical thinking, the CCTST questionnaire has been used.

### 2. 3. Critical thinking questionnaire

This questionnaire that has been developed by Fishon and Fishon in 1990 consists of 34 items in two forms "A" and "B". Form "B" consists of 34 items and can be used for measuring critical thinking of high school students. Indeed, this questionnaire measures the main critical thinking skills among academic educational periods. The questions include items that measure the meaning analysis of a sentence to more complex combination of critical thinking skills. Responding some of the items of these questionnaires requires inference of several assumptions.

On the other hand, responding other items requires evaluation and persuasion. It is assumed in the development of this test that the general ground of knowledge can be achieved through natural maturity in the primary and high schools. There is not any need to academic knowledge for responding items of questionnaire. The respondents need 45 minutes for responding the questionnaire. The questionnaire has six sub-criteria including analysis, evaluation, inference, deductive reasoning, and inductive reasoning.

### 2. 4. Reliability of the questionnaire

**Reliability:** Fishon and Fishon (1990) indicated that external reliability of this questionnaire is between 78-80 %.

**Reliability of the questionnaire in Iran:** Khalili reported that reliability of the questionnaire is 62 %.

**Validity:** the results of the studies that have been done in foreign countries revealed that there is a significant positive correlation between students' score, mathematical skills score, and other skills test.

**Validity of the questionnaire in Iran:** the results of factor analysis revealed that this construct consists of five components including analysis, evaluation, inference, deductive reasoning, and inductive reasoning. The results of the studies also revealed that there is a significant positive correlation between five components and total score. On the other hand, the results of this study differentiated critical thinking skills levels between nurses and philosophy students. In order to test reliability of the questionnaire, Cronbachs' Alpha Coefficient has been used. The coefficient was 0.61 for our questionnaire.

**Data-collection and research implementation methods:** as indicated in the past sections, this study is a survey-correlational research. The statistical sample of this study includes 130 students that have been selected randomly. The CCTST questionnaire has been used for collecting the research data.

**Data-analysis methods:** in order to summarize the research findings and test the research hypotheses, both descriptive and inferential statistics have been used in the SPSS. For this purpose, Pearson correlation coefficient, one-way analysis of variance, one sample t test, and Cronbachs' Alpha Coefficient has been used. The significance level of this study is 0.05.

### 3. FINDINGS

The findings of this study have been presented in two sections including descriptive and inferential findings.

**Table 2.** The average and standard deviation of the respondents' scores.

| Statistical measures                     |                 | Average | Standard deviation | Frequency |
|------------------------------------------|-----------------|---------|--------------------|-----------|
| Variables                                | Respondents     |         |                    |           |
| Critical thinking                        | Female students | 15.54   | 4.76               | 65        |
|                                          | Male students   | 14.94   | 4.43               | 65        |
| Critical thinking in terms of analysis   | Female students | 2.08    | 1.35               | 65        |
|                                          | Male students   | 1.97    | 0.968              | 65        |
| Critical thinking in terms of evaluation | Female students | 3.97    | 1.51               | 65        |
|                                          | Male students   | 3.68    | 1.65               | 65        |
| Critical thinking in terms of inference  | Female students | 2.23    | 1.34               | 65        |
|                                          | Male students   | 2.22    | 1.33               | 65        |

|                                                   |                 |      |      |    |
|---------------------------------------------------|-----------------|------|------|----|
| Critical thinking in terms of deductive reasoning | Female students | 3.72 | 1.75 | 65 |
|                                                   | Male students   | 3.85 | 1.57 | 65 |
| Critical thinking in terms of inductive reasoning | Female students | 3.54 | 1.54 | 65 |
|                                                   | Male students   | 3.22 | 1.57 | 65 |

**First hypothesis:** there is a significant relationship between critical thinking and academic achievement.

**Table 3.** The results of Pearson correlation coefficient.

| Variables            | Frequency | Average | Standard deviation | df  | R     | Sig   |
|----------------------|-----------|---------|--------------------|-----|-------|-------|
| Critical thinking    | 130       | 15.54   | 3.60               | 129 | 0.189 | 0.032 |
| Academic achievement | 130       | 15.30   | 1.89               |     |       |       |

Table 3 shows the results of Pearson correlation coefficient in terms of the relationship between critical thinking and academic achievement. The results of revealed that there is a significant relationship between critical thinking and academic achievement.

**Second hypothesis:** there is a significant difference between male and female students in terms of critical thinking.

**H 1-2:** there is a significant difference between male and female students in terms of critical thinking from analysis perspective.

**H 2-2:** there is a significant difference between male and female students in terms of critical thinking from evaluation perspective.

**H 2-3:** there is a significant difference between male and female students in terms of critical thinking from inference perspective.

**H 2-4:** there is a significant difference between male and female students in terms of critical thinking from deductive inference perspective.

**H 2-5:** there is a significant difference between male and female students in terms of critical thinking from inductive inference perspective.

**Table 4.** The results of t-test.

| Variable                                 | Group           | Frequency | Average | Standard deviation | df  | t      | Sig   |
|------------------------------------------|-----------------|-----------|---------|--------------------|-----|--------|-------|
| Critical thinking                        | Female students | 65        | 45.54   | 4.76               | 129 | 0.743  | 0.459 |
|                                          | Male students   | 65        | 14.94   | 4.43               |     |        |       |
| Critical thinking in analysis            | Female students | 65        | 2.08    | 1.35               | 128 | 0.523  | 0.602 |
|                                          | Male students   | 65        | 1.97    | 0.968              |     |        |       |
| Critical thinking in evaluation          | Female students | 65        | 3.97    | 1.51               | 128 | 1.05   | 0.294 |
|                                          | Male students   | 65        | 3.68    | 1.65               |     |        |       |
| Critical thinking in inference           | Female students | 65        | 2.23    | 1.34               | 128 | 0.001  | 0.999 |
|                                          | Male students   | 65        | 2.22    | 1.33               |     |        |       |
| Critical thinking in deductive inference | Female students | 65        | 3.72    | 1.75               | 128 | -0.421 | 0.674 |
|                                          | Male students   | 65        | 3.85    | 1.57               |     |        |       |
| Critical thinking in inductive inference | Female students | 65        | 3.54    | 1.54               | 128 | 1.18   | 0.240 |
|                                          | Male students   | 65        | 3.22    | 1.57               |     |        |       |

As the results of Table 4 revealed, there is not any significant difference between male and female students in terms of critical thinking ( $t = 0.743$ ,  $p = 0.459$ ). So the second hypothesis is not supported. It can be said that there is not any significant difference between male and female students in terms of critical thinking components. In other words, male and female students had similar critical thinking skills.

#### 4. DISCUSSION

The final purpose of education is development and growth critical thinking skills among students. With respect to this purpose, the present study has been done for investigating the relationship between critical thinking and students' academic achievement in the city of Eghlid.

The results of this study revealed that there is a significant relationship between critical thinking and students' academic achievement ( $p < 0/05$ ). The main hypothesis of this study has been supported and it can be said that there is a significant relationship between critical thinking and students' academic achievement. Many authors suggest that critical thinking is a reliable predictor of students' academic performance. In other words, students with higher levels of critical thinking skills have better abilities of information processing, organizing, deduction, inference, exploring, and openness to experience. As a result, they will have better academic performance (Fathi, 2003), (King, 1990). Another part of the results of this study indicated that

there is not any significant difference between male and female students in terms of critical thinking skills ( $t = 0.743$ ,  $p = 0.459$ ). So the second hypothesis of this study is not supported. This means that there is not any significant difference between male and female students in terms of critical thinking skills. In other words, male and female students had similar critical thinking skills. The results of this part of our study are consistent with findings of Shaabani (2003), Vahdat (2008), and Bakhtiarabadi et al. (2011).

Shaabani (2003) found that there is significant relationship between teamwork skills, critical thinking, and academic achievement. Vahdat (2008) found that there is significant relationship between critical thinking skills and academic achievement. Finally, Bakhtiarabadi et al. (2011) found that there is a significant relationship between critical thinking skills, cognitive learning styles, and students' academic achievement in the medical university of Isfahan. They also found that students' gender does not influence their desire toward critical thinking, as there is not any significant relationship between respondents' gender and their desire toward critical thinking.

## 5. CONCLUSION

Training and developing critical thinking skills among is very important effective factors on the students' academic performance. The results of this study revealed that there is a significant relationship between teachers' critical thinking and students' educational achievement ( $p \leq 0/05$ ). Another part of the results indicated that there is not any significant difference between male and female students in terms of critical thinking. It is suggested that the academic managers and authorities attempt to promote critical thinking skills among students and professors. At macro level, it is suggested that governmental authorities make many changes in the training and educational periods and contents and their implementation.

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