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## Relationship between Students' Critical Thinking and Self-efficacy Beliefs in Ferdowsi University of Mashhad, Iran

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### Abstract

Nowadays, critical thinking and motivational factors affecting it, such as self-efficacy have been heavily regarded by higher education systems. This descriptive-correlation study aimed to investigate the relationship between students' self-efficacy and critical thinking in Ferdowsi University of Mashhad, Iran. A random sample of 216 students completed Sherer et al.'s (1982) General Self-efficacy Scale and the California Critical Thinking Skills Test- Form B (1994). Finding showed a significantly positive relationship between students' self-efficacy and critical thinking ( $r = 0.21$ ,  $p < 0.001$ ). Hence, self-efficacy as motivational factor should be considered for developing learners' critical thinking skills.

*Keywords:* self- efficacy, critical thinking, curriculum, higher education;

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### 1. Introduction

There is an increasing attention to critical thinking in recent decades. Especial national boards responsible for evaluating education system quality confess to various education systems' inability to develop critical thinking skills and emphasize the inclusion of this main skill in curricula and all academic education systems confirm the necessity of passing some training courses in critical thinking by students before their graduation (Hurst, 1999). Myers (1992) argues that students do not able to think critically unless they change their interpretation from reality and think of replaced realities.

#### 1.1. Critical thinking

A commonly perceived definition is needed for critical thinking (Porter, Igein, Alexander, Blaylock, Comb & Williams, 2005). But there is no consensus about critical thinking definition (Kennedy, Fisher & Ennis, 1991). Lyutykh (2009) argues that critical thinking is "a right way of thinking". Bowell and Kemp (2005) believe that critical thinking is an individual's engagement in/deciding on/ responsibility for actions they deal with in daily life. Some argue that critical thinking is determined by especial skills such as ability to evaluate the presented reasons sensibly (Mason, 2008). Citing Bloom, Page (2007) argues that critical thinking relates to high level cognitive thinking (analysis, synthesis and evaluation). Bullen (1998) says that critical thinking is a well-founded thought which focuses on what we believe and what we do. Facion and Facion (1994) state that critical thinking includes evaluation, inference, analysis, deductive reasoning and inductive reasoning.

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## 1.2. Self-efficacy

Some studies found that many different environmental and personal factors are affected the development of critical thinking skills. One group of these factors is socio-environmental (Lassing, 2009) and the other is personal characteristics and motivational beliefs, including among others, self efficacy beliefs (Hoffman & Gregory, 2009). Self-efficacy beliefs have a considerable position in different aspects of our today's life (Maddux, 2002) and an important role in individuals' decision making process, thinking modes and problems solving approaches (Dweck, 1988). Pajars (1997) states that self-efficacy refers to individuals' judgments on their abilities to achieved their designed performance levels. It can be defined as a level of an individual's self confidence (Jain & Dowson, 2009). Tierney (2002) believes that self-efficacy is an individual's belief in their ability to create some innovative consequences. The self-efficacy does not limit to an especial situation or a certain behavior (Sherer & Maddux, 1982) and regulates human performances by cognition, motivation, decision making and thoughtful process (Benight & Bandura, 2004).

In general, self-efficacy as a motivational construct has a main role in the development of critical thinking. In a broad theoretical framework, Whitehead considers learners' motivations and interests as important factors affecting their critical thinking (Myers, 1992). From the one hand, students' positive attitudes to and beliefs in their abilities result in their motivation and in the other hand, non-motivation is an obstacle to critical thinking. As self efficacy beliefs are described as the main components of behavior, specially those of behavioral change, they can effectively predict critical thinking abilities (Sang, Valcke, Braak & Tondeur, 2010). Wanga and Yi Wub(2008) found that self efficacy is a good predictor of using high level learning strategies, such as critical thinking. Bandura and Lock (2003) believe that self-efficacy creates motivation and improves performance. Such self efficacy-imposed motivation results in the improvement of critical thinking skills. Since self efficacy as a motivational factor mainly affects critical thinking and the lack of sufficient motivation is an obstacle to critical thinking development, this study aimed to investigated the possible relationship between students critical thinking and self-efficacy.

## 2. Methods

### 2.1. Participants and Procedures and Data Analysis

The research population included all students in Ferdowsi University of Mashhad, Iran, during academic year of 2010-2011, from which 216 students (150 girls and 66 boys) were selected randomly by using randomized multi-stage clustering method according to Morgan and Kerjcie's table. They were requested to complete Sherer et al.'s (1982) General Self-efficacy Scale and the California Critical Thinking Skills Test- Form B (1994). Data was analyzed by descriptive and inferential statistics (including independent t-test).

### 2.2. Instrumentation

Research instruments included two scales:

- 1) Sherer et al.'s (1982) 17-item General Self-efficacy Scale (G.S.E.S-17) incorporating 17 Likert 5-option questions that measures three aspects of behavior: Initiative, Effort and Persistence. Each Question has 1-5 score range. The higher scores for these questions (85 as the highest score) and the lower scores (17 as the least score) represent the stronger and the weaker self-efficacy, respectively. In Bosscher and Smith's study (1998), Cronbach's alpha coefficient for reliability was reported 0.69. In this study Kronbach's alpha coefficients was 0.81.
- 2) The 34-item California Critical Thinking Skills Test- Form B (CCTST-B-34): This scale has 34 multi-optional items with only one true answer and incorporates 5 critical thinking skills including evaluation, inference, analysis and deductive reasoning and inductive reasoning. The highest score is 34 and the scale must be completed during 45 minutes (Facion & Facion, 1994). Khalili et al. (2003) reported that the confident coefficient of the scale was 0.62 and the construct validity of all subscales was between 0.60-0.65 with highly positive correlation. In this study Kronbach's alpha coefficients was 0.78.

## 3. Results

### 3.1. Result of Pearson's correlation coefficient

As shown in table 1, findings related to the main research hypothesis showed a significant relation between students' self-efficacy and critical thinking ( $r= 0.21$ ,  $p< 0.001$ ). This correlation was higher in boys ( $r=0.24$ ) than girls ( $r=0.19$ ) in  $p<0.01$ .

Table 1. The result of Pearson's correlation coefficient between students' self-efficacy and critical thinking

gender	r	p-value
girl	0.19 **	0.002
boy	** 0.24	0.007
Total	0.21***	0.000

\*\* $p < 0.01$  \*\*\*  $p < 0.001$

### 3.2. Result of independent t-test

Table 2 shows the relationship between students self-efficacy, from the one hand, and their critical thinking, from the other hand, by their gender. There was a significant difference between girls and boys' self-efficacy, so that girls had higher self-efficacy than boys ( $t= 2.22$ ,  $p< 0.05$ ). There was no significant difference between girls and boys' critical thinking and two genders had relatively similar levels of critical thinking ability ( $t= -0.27$ ,  $p> 0.05$ ).

Table 2. The result of independent t-test for comparing students' self-efficacy and critical thinking by their gender

Variable	Gender	Mean	t	df	p-value
Self-efficacy	Girl	61.88	2.22	214	0.027*
	Boy	57.80			
Critical thinking	Girl	10.50	-0.27	214	0.78
	Boy	10.55			

\* $p < 0.05$

## 4. Discussion and Conclusion

This study aimed to investigate the relationship between students' self efficacy and critical thinking in Ferdowsi University of Mashhad. The result of Pearson's correlation coefficient showed significantly positive relation between students' self-efficacy and critical thinking ( $r= 0.21$ ,  $p< 0.001$ ). This finding accords with that of Phan's (2009) current broad study. In explaining the finding, it can be argued that as Benight et al. (2004) noted, self-efficacy beliefs regulate human performances by cognitive and thoughtful processes, and as Bandura (1997) said, self efficacy causes achievement by practice and behavior organization. Hence, high level cognitive processes, such as critical thinking, and motivational factors, such as self efficacy result in students' achievements. Wanga et al. (2008) found that students with high level self efficacy more apply high level learning strategies. We also found that there was significant difference between students' self efficacy by gender in favor of girls ( $t= 2.22$ ,  $p< 0.005$ ). The finding is not in consistent with that of Murriss (2002). Furthermore, we did not find any significant difference between students critical thinking by gender ( $t= -0.27$ ,  $p> 0.05$ ). This is in consistent with Curtis et al.'s (2008) findings.

In summary, the lack of motivation is of obstacles to critical thinking development (Myers, 1992) and self-efficacy beliefs as main factors for motivation play a considerable role in the development of critical thinking skills (Artino et al. 2009). With regard to the importance of critical thinking in higher education system and the results of our study, it can be concluded that holding classes in an argumentative mode and involving students in group discussion and contribution, as well as decreasing the memorization contents of curricula and increasing their challengeable and reflective contents are needed for the enhancement of critical thinking.

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