

In search of Critical Thinking and General Self- Efficacy; The case of Agricultural Students in Islamic Azad University at Maragheh

Mohammad Reza Noruzi

EMBA, PhD candidate, Public sector Policy Making
Tarbiat Modarres University, (TMU)
Tehran, Iran

Sama Elkhan Qocayeva

Magistr, Dissertant
Azerbaijan State Agricultural University, (ASAU)
Ganja, Azerbaijan

Abstract

Critical Thinking is closely related to notions of "personal skills", "life fitness", "practical intelligence and "personal competence". By developing Critical Thinking and studying its effects on General Self-Efficacy we can have students more compatible in every sophisticated and complicated era in both learning and their life. By using the practical guides in this paper professors and university instructors can develop students' critical thinking and general Self Efficacy. This paper will review more the critical thinking literature because of its importance.

Keywords: Critical thinking, General Self-Efficacy, Agricultural Students, Higher Education

Critical Thinking

Universities, higher education institutions and complexes are as a basis of cultural, social, economic and political community development in every country.

Today in most countries, universities and higher education institutions after the defense industry is considered as the largest state budget allocated departments. Therefore universities and higher education institutions are as a critical social system with a special impact on all society sectors.

Critical thinking of any kind is never universal in any individual; everyone is subject to episodes of undisciplined or irrational thought. Its quality is therefore typically a matter of degree and dependent on, among other things, the quality and depth of experience in a given domain of thinking or with respect to a particular class of questions. No one is a critical thinker through-and-through, but only to such-and-such a degree, with such-and-such insights and blind spots, subject to such-and-such tendencies towards self-delusion. For this reason, the development of critical thinking skills and dispositions is a life-long endeavor.

Also today, the importance and necessity of having managers, students and universities with higher critical thinking skills have not covered to others. On the other hand, traditional methods of teaching in the universities cause people with incapable knowledge for solving problems in the future society and now.

In other words, they cannot able to recall and use previous knowledge in the areas of practical and real life. However, the old concept of learning referred to transfer of information and new concepts based on behavioral and cognitive learning by teachers to students and their ability in applying learned knowledge in new positions and real world (Rahimi & Noruzi, 2012).

Critical thinking theoreticians agree that the intellectual roots for critical thinking primarily began with Socrates' form of questioning (Lipman, 1995; Thayer-Bacon 2000).

As Paul (1987) argues that there is a problem with the entire notion of attempting to produce one-line definitions of complex concepts such as critical thinking. Such "definitions" are, for Paul, inevitably incomplete and limiting (Sariolghamam & Noruzi, 2010).

2.1. Some Critical Thinking Definitions:

For many years, critical thinking has been one of the most controversial concepts .This concept, like many other concepts in psychology, is not well defined.

Psychologists have not reached an agreement on what critical thinking is. Although, critical thinking is a possession prized by most people, the term has no objective, agreed-upon referent either among the general public or contemporary psychologists.

Characteristics such as age, weight, or height in individuals have proper referents, but we cannot point to a single observable characteristic of a person to indicate his or her critical thinking [10].The problem resides in the fact that critical thinking is an abstract concept. It does not have any tangible, exact and physical basis. Critical thinking is a general concept for a group of processes which are inferred from people's explicit behaviors and responses. For example, we can observe the problem solving strategies and measure the result of using such strategies precisely, but critical thinking which is supposed to create such techniques is not observable (Rahimi & Noruzi, 2010).

However, there have been lots of attempts to define critical thinking. According to Kline (1991)" critical thinking is popularly defined as the ability to analyze, understand and deal with novel situations critically. The person with high critical thinking is seen as quick-witted, acute, keen, sharp, canny, astute, bright and brilliant. At the other end of the scale the person with no critical thinking is described as dim, dull, thick, half-witted or stupid" (Rahimi & Noruzi, 2010).

There are varieties of definitions regarding critical thinking among researchers and public but following are some according to Cosgrove (2009, pp 19-20):

- (1) An attitude of being disposed to consider in a thoughtful way the problems and subjects that come within the range of one's experiences.
- (2) "Knowledge of the methods of logical inquiry and reasoning, and some skill in applying those methods." (Glaser, 1941, 5-6)
- (3) "Reasonable and reflective thinking about what to believe or do" (Ennis, 1989)
- (4) "The ability to participate in critical and open evaluation of rules and principles in any area of life" (Scheffler, 1973, 62)
- (5) Dr. Elder said, Critical thinking involves the ability to:
 - Raise vital questions and problems;
 - Gather and assess relevant information;
 - Use abstract ideas to interpret information effectively;
 - Come to well-reasoned conclusions and solutions, testing them against relevant criteria or standards;

- Think open-mindedly within alternative systems of thought, recognizing and assessing their assumptions, implications, and practical consequences (Doughty, 2006, p.2; Noruzi & Hernandez, 2010).

(6) “Thinking that devotes itself to the improvement of thinking” (Lipman 1984, 51)

(7) “Skillful, responsible thinking that is conducive to good judgment because it is sensitive to context, relies on criteria, and is self-correcting.” (Lipman, 1995, 116)

All definitions are true and the appropriate one is the one which is most compatible with reader and researchers' goal so it can be selected the one which is more compatible with our research question.

Some Characteristics of Critical Thinkers

According to Paul (1993) the critical thinker will routinely ask the following questions:

- What is the purpose of my thinking (goal/objective)?
- What precise question (problem) am I trying to answer?
- Within what point of view (perspective) am I thinking?
- What concepts or ideas are central to my thinking?
- What am I taking for granted, what assumptions am I making?
- What information am I using (data, facts, observation)?
- How am I interpreting that information?
- What conclusions am I coming to?
- If I accept the conclusions, what are the implications? What would the consequence be if I put my thoughts into action?

For each element, the thinker must consider standards that shed light on the effectiveness of his/her thinking (Paul, 1993, pp 20-23; Gambrell & Gibbs 2009; Noruzi & Hernandez, 2010).

Self-efficacy

Self-efficacy was defined by Albert Bandura as a person's belief in their capability to successfully perform a particular task. Together with the goals that people set, self-efficacy is one of the most powerful motivational predictors of how well a person will perform at almost any endeavour. A person's self-efficacy is a strong determinant of their effort, persistence, strategizing, as well as their subsequent training and job performance. Besides being highly predictive, much is also known about how self-efficacy can be developed in order to harness its performance enhancing benefits (Heslin & Klehe, 2006; Sariolghamam & Noruzi, 2010).

Methodology and Instruments

This project has been done by two questionnaires with high reliability and validity among 175 (75 Male and 100 Female) agriculture higher education student in Islamic Azad University at Maragheh in four levels (freshman, sophomore, junior, and seniors). And studied the Critical Thinking and General Self-Efficacy between basic and humanity science students that study agriculture now and other hypothesis will be discussed as well.

Note: In Iran in Islamic Azad universities, the entrance exam are open in different courses for example you can study humanities but apply for agriculture for this we studied this hypothesis too as our third main hypothesis.

General Self-Efficacy, The General Self-Efficacy Scale is a 10-item psychometric scale that is designed to assess optimistic self-beliefs to cope with a variety of difficult demands in life.

The scale has been originally developed in German by *Matthias Jerusalem* and *Ralf Schwarzer* in 1981 and has been used in many studies with hundred thousands of participants. In contrast to other scales that were designed to assess optimism, this one explicitly refers to personal agency, i.e., the belief that one's actions are responsible for successful (Schwarzer, 2006).

Critical thinking, we used from a questionnaire of Foundation for Critical Thinking Press, 2007 contains of 20 questions and with permission of the developer (critical thinking.org, 2007).

Research Questions:

1. Is there significant relation between Critical Thinking and Self efficacy among Agricultural Students of Islamic Azad University at Maragheh?
2. Is there significant relation between Critical Thinking and Self efficacy among girls and boys of Agricultural Students of Islamic Azad University at Maragheh?
3. Is there significant relation between Critical Thinking and Self efficacy among Basic science and Humanity science studied in Agricultural Students of Islamic Azad University at Maragheh?

Data Analysis

To assess normal distribution, Descriptive statistics was applied. To determine the relationship between students' Self-efficacy and Critical Thinking, Pearson correlation test was used. Gender roles and the tendency to check the Critical Thinking and student Self-efficacy, independent t test were used.

Results

Table 3 shows the results of descriptive statistics for the two instruments – Critical Thinking and Self-efficacy questionnaires - used in the study.

Table 1: Descriptive Statistics for Self-Efficacy and Critical Thinking

	N	Minimum	Maximum	Mean	Std. Deviation
Critical Thinking	175	6	90	46.18	1.624
Self Efficacy	175	14	34	25.54	.332
Valid N (listwise)	175				

In order to evaluate the correlation between Self-efficacy and Critical Thinking of student, Pearson correlation test was used. The results showed that there is significant relationship between Self-efficacy and Critical Thinking of student ($p < 0.025$ $r = .153$) (see Table 2).

Table 2: Pearson Correlation between Self-efficacy and Critical Thinking of student

		Self-efficacy	Critical Thinking
Critical Thinking	Pearson Correlation	1	.118*
	Sig. (2-tailed)		.025
	N	175	175
Self-efficacy	Pearson Correlation	.118*	1
	Sig. (2-tailed)	.025	
	N	175	175

To evaluate the effectiveness of gender roles in student Critical Thinking and Self-efficacy, independent t test was applied. Results showed there are no significant difference between male and female students regarding the Critical Thinking ($p < 0.05$, $t = 1.787$) and Self-efficacy ($p < 0.05$, $t = 3.211$). As Table 3 shows the mean scores of female students in the life of effectiveness variable scores by students is more than male, but Self-efficacy scores in male students in grades got by female students in this variable are more.

Table 3: Independent t test for the role of gender in Critical Thinking and Self-efficacy

	T	DF	Female Means	Male Means	P
Critical Thinking	1.787	166	66.88	54.70	.005
Self-Efficacy	3.211	166	43.22	63.30	0.002

Table 4: Independent t test for the role of Tendency in Critical Thinking and Self-efficacy

	T	DF	Basic Science Means	Humanity Science Means	P
Critical Thinking	1.114	174	60.51	65.50	.047
Self-Efficacy	0.321	174	40.49	34.50	.760

For investigating the roles of educational tendency of students' Critical Thinking and Self-efficacy, independent t test was applied. The results showed that the difference between students of Basic Sciences and Humanities trends are not significant regarding the Critical Thinking ($p < 0.05$, $t = 1.114$) and Self-efficacy ($p \geq 0.05$, $t = 0.321$)

Discussion and Implications

“A critical thinker is...one who is *appropriately moved by reasons*...critical thinking is impartial, consistent, and non-arbitrary, and the critical thinker both acts and thinks in accordance with, and values, consistency, fairness, and impartiality of judgment and action” (Emphasis in original; Siegel, 1990, pp.23, 34). Some characteristics of critical thinking are:

1. It is purposeful.
2. It is responsive to and guided by intellectual standards (relevance, accuracy, precision, clarity, depth, and breadth).
3. It supports the development of intellectual traits in the thinker of humility, integrity, perseverance, empathy, and self-discipline.
4. The thinker can identify the elements of thought present in thinking about any problem, such that the thinker makes the logical connection between the elements and the problem at hand.
5. It is self-assessing and self-improving. The thinker takes steps to assess his/ her thinking, using appropriate intellectual standards. If you are not assessing your thinking, you are not thinking critically.

6. There is integrity to the whole system. The thinker is able to critically examine his/her thought as a whole and to take it apart (consider its parts as well). The thinker is committed to be intellectually humble, persevering, courageous, fair, and just. The critical thinker is aware of the variety of ways in which thinking can become distorted, misleading, prejudiced, superficial, unfair, or otherwise defective.
7. It yields a well-reasoned answer. If we know how to check our thinking and are committed to doing so, and we get extensive practice, then we can depend on the results of our thinking being productive (Noruzi & Hernandez, 2010; Sariolghamam & Noruzi, 2010).

Some practical guides for having critical thinkers in universities come in the following:

1. Reading books that are related to improve thinking critically in the organizations and universities.
2. Doing cross word puzzles for developing critical thinking.
3. Providing some special time for discourse and discussions about critical thinking.
4. Reading, listening and reviewing materials regarding thinking critically.
5. Holding some specific meeting and workshops for developing organization's health and critical thinking.
6. Doing exercises for developing critical thinking abilities.
7. Using mass media, newspapers and bulletins for employees and managers and others who have role in the universities, about the importance of thinking critically and having health organizations.
8. Reading manifestos of successful characters with high critical thinking talents.
9. Searching strategies that develop critical thinking ability in the universities.

Encouraging people with suitable strategies to have high critical thinkers (Rahimi & Noruzi, 2012).

References

- Cosgrove, Rush, (2009), Critical Thinking in the Oxford Tutorial, Thesis submitted to the University of Oxford in partial fulfillment for the degree of M.Sc. in Higher Education
- Critical thinking , 2007, available at: <http://www.criticalthinking.org/>
- Doughty, Howard A (2006), the Limits of Critical Thinking, review essay, The Innovation Journal: The Public Sector Innovation Journal, Volume 11(3), article 11.pp 1-10
- Gambrill, Eileen-Gibbs, Leonard (2009), Critical Thinking for Helping Professionals A Skills-Based Workbook Third edition, Oxford University Press.
- Glaser, Edward Maynard (1941). *An Experiment in the Development of Critical Thinking*, Teachers College, Columbia University.
- Lipman, M. (1984). "The Cultivating of Reasoning Through Philosophy," *Educational Leadership*, 42, 1, 51-56.
- Lipman, M. (1995). *Thinking in Education*. Cambridge: Cambridge University Press.
- Noruzi, Mohammad Reza – Jose Vargas Hernandez, (2010), Acta Universitatis Danubius. (Economica, Vol 6, No 1 (2010), An Exploration of Critical Thinking Necessities, Barriers and CAT MAGIC Notion
- Paul, Richard. Binker, A.J.A., Adamson, K., and Martin, D. (1987). *Critical Thinking Handbook: High School*. Rohnert Park, CA: Center for Critical Thinking and Moral Critique, Sonoma State University.
- Paul, R. (1993). *Critical thinking: What Every Person Needs to Survive in a Rapidly Changing World (Revised 3rd. Ed)*(pp. 20–23). Santa Rosa, CA: Foundation for Critical Thinking. www.criticalthinking.org.
- Rahimi, Gholam reza, Irani, farhad, Noruzi Mohammad reza, 2012, Study on the Relationships between Managers' Critical Thinking with Organizational Health Scale in Islamic Azad University Branches in Locale 13 Considering Three Scales: Supervisors, Managers and Employees, J. Basic. Appl. Sci. Res., 2(4)4085-4091, 2012.
- Sariolghalam, Narges, Mohammad Reza Noruzi, (2010), A Survey on the Relationship between Critical Thinking and Self-Efficacy --Case Study: Mathematic Students of Payam e Noor University in Maragheh, Studies in Mathematical Sciences, Vol 1, No 1 (2010)
- Scheffler, (1973). *Reason and Teaching*. Indianapolis: Hackett Publishing Company.
- Schwarzer, 2006, General Self-Efficacy Scale (GSE), available at: <http://userpage.fu-berlin..Htm>
- Siegel, Harvey (1990). *Educating Reason*. London: Routledge.
- Thayer-Bacon, Barbara (2000). *Transforming Critical Thinking: Thinking constructively*. New York: Teachers College.