

A Comparative Study of Critical Thinking Skills and Critical Thinking Disposition in Veteran and Non-Veteran Students

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Abstract

Aims: Today critical thinking is regarded as the main output of higher education in any country. The aim of this study was to compare critical thinking skills and critical thinking disposition in veterans and non-veteran students in Gilan-e-Gharb and Ghasr-e-Shirin from September 2010 until February 2011.

Methods: This comparative study was performed on 80 veteran and non-veteran students in Gilan-egharb and Ghasreshirin Islamic Azad University. Data was collected by the California Critical Thinking Skills questionnaire and the California Critical Thinking Disposition questionnaire.

Results: The mean score and standard deviation of critical thinking skills were 12.45 ± 2.12 in non-veteran students and 12.12 ± 2.51 in veteran students. The mean score and standard deviation of critical thinking disposition were 262.34 ± 25.64 in non-veteran students and 278.46 ± 20.17 in veteran students. The mean score of critical thinking dispositions between non-veteran and veteran students showed a significant difference in truth component ($p=0.001$) and veterans had more positive trends in growth and curiosity components.

Conclusion: Considering the results of the study, policy makers and authorities must devote more time and attention to developing critical thinking dispositions in their educational programs.

Keywords: Critical thinking; Veterans; California Critical Thinking Disposition Questionnaire; California Critical Thinking Skills Questionnaire

Introduction

Future belongs to societies which prepare themselves for learning [1]. The job market is getting more difficult for the university graduates. Employers look for educated employees who are innovative and creative enough to solve their problems. They are seeking employees who have the ability to gather information, analyze it, organize it, come up with the right conclusion, and provide feedback on the process. All these skill are the building blocks in critical thinking [2]. The development of critical thinking skills is so important that some scholars believe that the major goal of having academic education is developing such skills [3]. They believe that education means teaching how to think critically [4]. Higher education has a critical role in a society's development, and one of its main objectives is to train individuals who can engage in academic activities using different forms of thinking skills [5-6]. Today, after reading, writing, and mathematics, critical thinking is known as the fourth critical element in education which has found its position in every curriculum in order to improve the quality of education. It is also regarded as a must in most academic programs [5,7].

Critical thinking has two dimensions: critical thinking skills and critical thinking disposition. While the first dimension emphasizes on cognitive strategies, the second dimension focuses on the attitudinal elements and the internal motives for problem solving. Critical thinking skills are kind of cognitive skills by nature. An ideal critical thinker must possess such skills. In fact, calling someone 'an ideal critical thinker' is not possible without first checking his or her approach to life, questions, and problems. Without a positive attitude toward critical thinking, critical thinking never occurs or if it does, it is below the standard levels. As such, having a tendency for critical thinking is a critical part of critical thinking [8,10].

There have been a number of studies on critical thinking skills in nursing and midwifery students in Iran. *Baba Mohammadi* and *Khalili* found junior and senior nursing students' critical thinking skills to be higher than those of nursing freshman and sophomore students. They also emphasized the role of universities in developing such skills [11]. *Bahmanpoor* [12] studied the effect of teaching on method of problem base learning and critical thinking skills, critical thinking factors, attitude and behavior of nursing students at Tehran University of Medical Sciences. He observed a significant difference between the treatment and control group in their critical thinking skills after the instruction [12].

All this demonstrates the important role of critical thinking, which needs more thorough investigation. This is more significant in the case of the comparison between veterans and others because in the western part of Iran (as in Gilan-e-Gharb and Ghasr-e-Shirin), veterans constitute the majority of university students. As such, the identification of variables affecting their learning and education is of utmost importance. The present study was an attempt to compare the critical thinking skills and disposition in veteran and non-veteran students in that part of Iran.

Methods

In this cross-sectional study, critical thinking skills and critical thinking disposition were examined in veteran and non-veteran students. The population of the study included all those studying at AA level at Azad University in Gilan-e-Gharb and Ghasr-e-Shirin in the second semester in 2010. The sample consisted of 80 participants with 40 in each group. The mean age of the participants was 20.42. There were 38 female (47.5%) and 42 male (52.5%) participants.

After forming each group, the purpose and nature of the study and the way they were supposed to answer the questions in the study

was explained to the participants. All participants had already expressed their consent for taking part in the study. For those participants to whom the researchers did not have direct access, a brochure explaining the needed information on how to complete the questionnaire was prepared and given to them.

The data collection apparatus consisted of 3 questionnaires; a questionnaire checking participants' demographical information, California Critical Thinking Skills questionnaire (form B), and California Critical Thinking Disposition questionnaire.

The California Critical Thinking Skills (CCTS) questionnaire consists of 34 multiple-choice questions with 3 subscales checking respondents' inference, deduction, and evaluation. According to the questionnaire manual, participants should complete in 45 minutes. The test questions cover different topics, with most questions combining content with reasoning.

The California Critical Thinking Disposition (CCTD) questionnaire consists of 75 items in the form of a 6 point *Likert* scale ranging from 'completely disagree' to 'completely agree.' There were seven subscales in CCTD questionnaire: truth-seeking (12 items), open-mindedness (12 items), analyticity (11 items), organizing (11 items), self-confidence (9 items), and maturity (10 items), and curiosity (10 items). The validity and reliability of this test has been demonstrated many times in previous studies [13,14]. A score of 350 or above represents a strong disposition, a score between 280 and 300 shows positive inclination, a score between 211 and 279 represents ambivalence, and a score below 210 shows a negative tendency in the respondents. For each subscale, a score above 50 means a strong positive tendency, 40-50 means positive inclination, 31-39 means ambivalence, and a score below 30 means negative tendency [13].

For the purpose of data analysis, a MANOVA was performed between the two groups with an α set at 0.05 using SPSS 15.0.

Results

The mean score in CCTS for the veteran and non-veteran group was 12.12 and 12.45 respectively with the difference not being statistically significant as checked with an independent samples t test. The non-veteran group's scores in the CCTS subscales were a little higher than those of the veterans, but the difference was not found significant for any of the subscales (see Table 1 & 2).

The veterans' mean score in critical thinking disposition was 278 (SD = 20.17), while it was 262 (SD = 25.64) for non-veterans. Both means fall in the ambivalence category (211 to 279). This shows that the tendency for critical thinking is ambivalent for both veterans and non-veterans.

Regarding the California Critical Thinking Disposition subscales, the observed difference between the two groups was statistically significant only for 'truth seeking' subscale with the rest of subscales showing no significant difference. The results indicate that both groups' scores in 'truth-seeking,' 'open-mindedness,' 'analyticity,' and 'organizing' subscales fall into the 'ambivalence' category. Regarding the self-confidence subscale both groups had a positive inclination. In curiosity and maturity subscales, while veterans had a positive inclination, non-veterans were ambivalent (see Table 3).

Table 1. Descriptive Statistics for Participants' Critical Thinking Skills

Index	Sample	Frequency	Mean S.D	±
Analysis	Non-veteran	40	1.5±4.37	
	veteran	40	4.11±1.8	
Evaluation	Non-veteran	40	4.25±2.1	
	veteran	40	4.18±2.3	

Index	Sample	Fre- quency	Mean S.D	±
Inference	Non- veteran	40	3.56±2.8	
	veteran	40	3.83±2.2	
Total Score	Non- veteran	40	2.12±12.45	
	veteran	40	2.5±12.12	

Table 2. MANOVA for CTSQ Subscales

Index	Sum of Squares	D F	Mean squares	F	P
Analysis	34.5	1	34.5	12.05	0.606
Evaluation	0.008	1	0.008	0.004	0.55
Inference	3.1	1	3.1	0.8	0.58

Table 3. Descriptive Statistics for Critical Thinking Disposition

Index	Sample	Frequency	Mean ± S.D
Truth Seek- ing	Non- veteran	40	35.25±3.8

Table 4. MANOVA Result for CTDQ Subscales

Index	Sum of Squares	DF	Mean Squares	F	P
Truth Seeking	171/6	1	171/6	9/2	0/001
Open – mindedness	146/1	1	146/1	10/2	0/45
Analyticity	154/3	1	154/3	8/9	0/7
Organizing	131/8	1	131/8	7/6	0/12
Self-Confidence	156/2	1	156/2	9/3	0/15
Curiosity	192/4	1	192/4	11/4	0/25
Maturity	144/5	1	144/5	10/1	0/35

Discussion

Many scholars and philosophers believe that developing critical thinking skills is not only the most important goal of educational systems in any society, but it must also be the ultimate objective for any academic training [15].

University students constitute a major part of the intellectuals in any society. University professors also do their best to train them in order for the society to be able to benefit from them in future. Veterans con-

Index	Sample	Frequency	Mean ± S.D
Open – mindedness	veteran	40	37.19±4.12
	Non- veteran	40	36.63±4.7
Analyticity	veteran	40	36.18±4.21
	Non- veteran	40	38.68±6.12
Organizing	veteran	40	38.95±6.85
	Non- veteran	40	35.52±3.85
Self-Confidence	veteran	40	37.59±5.7
	Non- veteran	40	40.27±4.44
Curiosity	veteran	40	44.87±4.75
	Non- veteran	40	37.44±3.95
Maturity	veteran	40	43.35±4.28
	Non- veteran	40	38.55±6.15
Total Point	veteran	40	40.33±4.85
	Non- veteran	40	262.±25.64 34
	veteran	40	278±20.17

stitute a big part of the university population especially in those areas which experienced the war between Iran and Iraq. They have experienced chemical weapon effect during war and now they are part of the society of the intellectuals. Therefore, the examination and study of what and how they think should not be overlooked.

The results of the study showed no significant difference between veterans and non-veterans' critical thinking skills. It seems that veterans' critical thinking skills are

not that much affected by the physical injuries and the psychological harms caused by war. As such, veterans can pursue their education the same way as non-veterans do.

Regarding the participants' critical thinking disposition subscales, only 'truth seeking' subscale showed a significant difference between veterans and non-veterans, with veterans showing a higher tendency toward truth seeking. This could be due to the psychological damage imposed on them in war. They have to live their whole life with the realities of the war they went through; therefore, they find a higher tendency toward the truth of everything.

The results also showed a higher level of curiosity in veterans. In fact, critical thinking ability is not developed by listening to lectures, reading books, and test taking at the end of the semester. Teachers and university professors need to be aware that the main goal, in addition to knowledge transfer, is to provide situations for practicing critical thinking, problem solving learning, decision making, innovation, and creativity. By developing educational contexts in which thinking, questioning, reasoning, and discussion takes place, one can develop critical thinking skills in students. In order to create such contexts, one can manage class time so that more time is devoted to discussions in class [16].

The veterans and non-veterans' mean score in critical thinking skills were 12.45 and 12.12 respectively. Other studies carried out in Iran came up with similar results. The mean score for critical thinking skills was 11.68 for nursing students at Tehran University of Medical Sciences and 12.07 for midwifery students at the

same university [3,17]. Some other studies, however, carried out outside Iran, reported a mean score of 18.2 for nursing students, and 18.32 for pharmacy freshmen students [18,19]. Other studies done in Iran also reported different scores. The CTS mean score for students of medicine at clinical stage in Shiraz University was found to be 15.3 [15] and 12.34 for nursing students at Semnan University of Medical Sciences [11].

The literature indicates that by the increase in the number of years one studies at universities, their critical thinking skills also increase. For example, students of medicine at clinical stage had a much higher mean score in comparison with AA nursing students. The mean score of the participants in this study who were all AA students matched the previous studies on students at that level.

Regarding the subscales in critical thinking skills questionnaire, the mean scores *Rimiene* [21] reported for 'analytical skills,' 'evaluative skill,' 'inferencing skills,' 'inductive skills,' and 'deductive skills' were 3.33, 4.03, 3.38, 3.85, and 5.28 respectively. However, some other studies have reported somewhat higher scores for all the above-mentioned subscales [19,19,22].

Gharib [23], using Glaser's critical thinking test, states that participants' scores in the subscales cannot be a good indicator of their critical thinking skills. He believes that the total score is a much better measure. No matter which index better represents individuals' critical thinking skills, what is clear is that it is possible to increase learners skills in evaluative and inductive skills by instruction.

Conclusion

Based on the results obtained, it seems that educational policy makers and stake holders need to pay a special attention to the development of critical thinking skills and disposition in students. Critical thinking is one of the most important basic standards for the World Federation of Medical Education and a criterion for faculty accreditation. As such, it is necessary that the educational policy makers give a special attention to veterans and use their potential capabilities. It is suggested that future studies focus more on the reasons of critical thinking tendency in people.

Acknowledgement: We would like to thank all those who helped us by participating in this study.

References

1. Marshall R, Tucker M. Thinking for a Living: Education and the wealth of nations. New York: Harper Collins; 1992.
2. Gardner J, Jewler J. Your college experience. 4 ed. Belmont: Wadsworth Pub Co; 2000.
3. Mayers Ch, Abili Kh, translator. Teaching student to think creatively. Tehran: SAMT; 2001. [Persian]
4. Facione P, Facion N, Giancarlo C, Blohm S. Teaching for thinking. Insight assessment and the California Academic Press; 2002.
5. Amin Khandaghi M, Pakmehr H. The relationship between students' critical thinking and mental health in Mashhad University of Medical Sciences. Journal of Fundamentals of Mental Health. 2011;3(2):114-123. [Persian]
6. Parirokh M, Fattahi R. Guidelines for writing articles and reviewing research literature in the areas of human and social sciences. Tehran: Librarian; 2005. [Persian]
7. Hurst P. Philosophy of education; the main themes in the tradition of analytical. Shabani Varaki B, Shoja Razavi MR. (translators). Mashhad: Ferdowsi University of Mashhad; 2006. [Persian]
8. Profetoo-McGrath J. The relationship of critical thinking skills and critical thinking dispositions of baccalaureate nursing student. J Adv Nurs. 2003;3(6):569-77.
9. American Philosophical Association. Critical thinking: a statement of expert consensus for purposes of educational assessment and instruction: the Delphi report. Millbrae: The California Academic Press; 1990.
10. Facione P. Critical thinking: what it is and why it count. Insight assessment and the California Academic Press; 2004.
11. Baba Mohammadi H, Khalili H. Critical thinking skill of nursing student of Semnan University of Medical Sciences. Iranian Journal of Medical Education; 2004;12(4):23-31. [Persian]
12. Bahmanpoor K. A survey on effect of teaching on method of problem base learning and critical thinking skills, critical thinking factors, attitude and behavior of BSc nursing student in Medical university of Tehran.: Tehran University of Medical Sciences; 2003. [Persian] (dissertation)
13. Facion PA, Facion NC. The California critical thinking skills test :form A and form B, test manual. Millbrae :California Academic Press; 1993.
14. Khalili H. Determination of Validity, reliability and normality of scores of critical thinking skills test (form B). Master thesis. Tehran: Nursing Faculty of Shahid Beheshti Medical University; 1999. [Persian] (Dissertation)
15. Sezer, R. Integration of critical thinking skills in to elementary school teacher education courses in mathematics. Education. Proquest education journals; 2008; 128(3):349.
16. Eslami Akbar R, Maarefi F. A comparison of critical thinking ability in the first and last term baccalaureate student of university of nursing and clinical nurse of Jahrom University of Medical Sciences in 2008. J Jahrom Univ Med Sci 2010;8(1):37-45. [Persian]
17. Khalili H. assessment critical thinking in nursing student of Medical university of Tehran. Proceeding of the 4th National Conference on Medical Education, 2000 November. Tehran University of Medical Sciences. 2000. [Persian]
18. Bowles K. The relationship of critical-thinking skills and the clinical-judgment skills of baccalaureate nursing students. J Nurs Educ. 2000; 39(8):373-6.
19. Miller DR. Longitudinal assessment of critical thinking in pharmacy students. Am J Pharm Educ. 2003;67(4):120.
20. Moatari M. The effect of rethinking on cognitive styles, thinking strategies in fourth years nursing students.

ing student. Tabriz: Faculty of Nursing and Midwifery. Tabriz University of Medical Sciences. 2002. [Persian] (dissertation)

21. Rimiene V. Assessing and developing students' critical thinking. *Psychology Learning and Teaching*. 2002;2(1):17-22.

22. Loo R, Throp K.A Psychometric investigation of scores on the Watson Glasser Critical Thinking Appraisal new forms. *Educational and psychological Measures*. 1999;59:995-1003.

23. Gharib M. The Relationship of Critical Thinking Skill and Critical Thinking Disposition in Senior Student MSc of Medical Science. University of Tehran. Tehran Faculty of Nursing & Midwifery. Iran University of Medical Sciences; 2006. [Persian](Dissertation)

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