

A study on the relationship between critical thinking skills and control of emotions among the students in field of software within Borujerd technical and vocational college-girls branch

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ABSTRACT : The present research as a descriptive- correlative survey was conducted aiming at investigating the relationship between critical thinking skills and control of emotions among the students in field of software within Borujerd technical and vocational college-girls branch. The statistical population (140) consists of all the students at the field of child coaching within Borujerd technical and vocational college-girls branch at the second semester 2014. The sample group (103) has been selected via simple random sampling method based on Morgan table. Data collection instruments include California Critical Thinking Skills Test; Form B (CCTST) and Affective Control Scale (ACS). Further, the obtained data were analyzed using software SPSS 22, Pearson correlation coefficient and regression analysis. There was a significant correlation between critical thinking and control of emotions among the students ($r=-0.42$) ($p=0.000$, $p<0.01$). Among the subscales of control of emotions, anger has had the highest correlation ($p=0.000$, $r=-0.54$) with critical thinking and anxiety had the least correlation ($p=0.002$, $r=-0.31$) with critical thinking. Among the components of critical thinking, it was just a significant correlation between component of assessment and control of emotions ($p=0.000$, $r=-0.72$). Further, the component of assessment has had the highest correlation ($p=0.000$, $r=-0.74$) with anxiety and has had the least correlation ($p=0.000$, $r=-0.30$) with positive affect. Variance of control of emotions was predictable through critical thinking ($P<0.01$). With regard to a significant relationship between control of emotions and critical thinking, it can deduce that improvement in critical thinking results in increase in control of emotions.

Introduction

Emotions constitute an essential part of people's lives in a way that is difficult to image life without it. Emotional features and changes, how to make emotional relationship and understanding from others' emotions play a major role in personality growth, moral development and social relations, identity formation and concept of oneself (Lotfabadi, 1998). All the humans experience emotions and excitements in their life, which this is totally natural to express different emotions and excitements in encounter with different situations, yet severe negative emotions and excitements are abnormal mentioned not just non-constructive but destructive and harmful (Ghadiri, 2006).

Emotional extremes lead to conflict, aggression, anger, hatred and anxiety, threatened people's mental and emotional health in a serious way (Ahmadi, 2003). Indeed, we can never evade negative feelings, because feelings are inseparable part of our life (Robins et al. 2013). It is better to prevent expression of emotions rather than reduce their reactive outcomes so as to have sufficient opportunity for better decisions, foresight and creativity (Sharifi Daramadi et al. 2007). The purpose of control of emotions skill is to teach people how to recognize their emotions in different situations and express and control it (Gross, 1998). Indeed, emotion management causes the individuals become realistic, honest and benevolent and turn to useful people in the progress of the society (Shoari nejad, 2013). Students have been mentioned among the social classes as efficient people who can be considered as the most important human resources for development and growth in the societies, especially more than half of the students are girls in our country regarding official statistics of the Ministry of Education. This important and influential social class requires controlling their emotions, because the young student might confuse in encounter with friends' pressure, educational pressures, attempt for independence and various decision makings and acceptance for responsibility in future and might think everything out of his control and also fail to manage control of his emotions in social and family situations, thus he will face various problems which damage both him and society including depression, anger, anxiety and so forth (Biabangard, 2010). To prevent from the mentioned damages in the students, universities can provide suitable infrastructure through various programs so as to induce the students to high thinking levels including critical thinking. Further, role of educational centers must change to the source of information and role of professors must change to the transfer of information, so that the students must increase their skill in critical thinking and utilize them after information processing rather than

maintaining the proposed information (Myers, 2012). This is in a way that today the education centers have taken the opportunity for thinking from the learners by abundant transfer of scientific concepts and excessive supply of knowledge and information. It is totally clear that transfer of information is not sufficed to resolve problems in today's complicated world, but learners must be provided with the thinking conditions, which this is possible through changing the traditional educational methods and strengthening the critical thinking skills (Khoda moradi et al. 2011). On the other hand, the people must enable to think critically to make proper decisions about their personal and social problems so as to have successful life in the democratic society. If the students learn to think critically, they will be conducted that the life makes them alive (Walker Garrison, 2006).

In recent years, educational experts have expressed concerns over the inability of the learners in terms of the critical thinking (Myers, 2012). Since fostering critical thinking among people is one of the major aims of education, it must raise the spirit of criticizing, examining and analyzing among the students in addition to strengthening spirit of taking criticism (Myers, 2012). Critical thinking is a new issue, yet it dates back to the history of human thinking. When Sophists proposed relativism in the Greece, Socrates was forced to seek the truth and Aristotle established formal logic, critical thinking was created (Nasr Abadi et al., 2006). According to the experts' and scholars' agreed-upon definition for importance of critical thinking, various ideas have been proposed for definition and nature of critical thinking (Vacek, 2009). Any researcher has defined critical thinking regarding his individual understanding and research requirements (Bataineh et al, 2009). The critical thinking association, quoted from Snyder et al.(2008), has defined critical thinking as the process of thoughtful organizing, active and skillful conceptualizing, applying, analyzing, combining and evaluating gathered or generated information by observation, experience, reflection, reasoning, or communication as a guide for consideration and action. Robert Ennis (1963) in an article entitled "a definition for critical thinking" has raised a turning point in the critical thinking movement, attempted to signify the applied aspects of logic and make a linkage between Practical and formal logic. Later Ennis modified and corrected his definition for critical thinking as follow: critical thinking refers to a logical thinking which is centralized on our decision making about what we want to do or believe in (Ennis, 2002).critical thinking implies purposive and result-oriented thinking which requires judgment(Jackson et al, 2006). Critical thinking refers to purposive and result-oriented thinking which requires judgment (Jackson et al, 2006). Critical thinking is considered as a major cognitive process for utilization of knowledge which this kind of thinking can be used for problem resolving and decision making at social, clinical, moral, managerial and political contexts (Gul et al, 2010). Page, quoted from Blum, has introduced critical thinking related to the thinking of high cognitive levels (Page and Mukherjee, 2007). Ultimately, Facione et al. (1994) have known critical thinking included of evaluation, inference, analysis, deductive reasoning and inductive reasoning(Facione et al, 1994). A variety of studies have been conducted on critical thinking and control of emotions. Yet no study has been conducted on the relationship between critical thinking and control of emotions. The studies on critical thinking and control of emotions include:

According to a study, critical thinking skill has been normal among the first semester and last semester students; there was a significant difference on critical thinking among the first semester and last semester students (Gharib, 2006).

Lin Li et al.(2009) conducted a study and indicated that significance of teaching control of emotions and how to manage it to the mothers with the children with learning inability cause increase in self-awareness, having healthy relationship with others and huge effect on physical, mental and emotional health of children.

In a study entitled "effect of consolidated behavioral and emotion-oriented counseling on control of emotions among the girl adolescents in Koshku`iyeh", it was specified that consolidated behavioral and emotion-oriented counseling has a significant effect on control of emotions, depression, anxiety and positive affect and has no significant effect on anger among the adolescents(Dehsh, 2009).

In a study entitled "effectiveness of consolidated group therapy in clinical decision making approach and effectiveness of Narrative Therapy in control of emotions among girl adolescents in Shiraz", it was perceived that consolidated group therapy of clinical decision making approach and Narrative Therapy has had a significant effect on control of emotions among adolescents (Ghaderi et al. 2010). With regard to another research, it was specified that skill of normal girls in control of emotions, control of anger and control of depression is more than that of veteran girls; further no significant difference has been observed on control of anxiety and positive affect between two groups(Asadi. 2010). In another research entitled "comparison of critical thinking skills among the students in university of medical sciences-Bushehr", no significant difference was observed between mean of scores of medical, nursing and midwifery students. Although the scores in the first semester to the last semester have had an ascending trend, this difference has not been significant (Azdi et al. 2010). Further, in another research, the development process of the critical thinking among the students in Ferdowsi university of Mashhad has been examined. Findings of the present research indicate that there is a significant difference between mean of scores of critical thinking among the first and fourth semester students (Javidi Kalateh Jaffar abadi et al. 2010). In a research entitled "an overview on critical thinking of students within Payame Nour Shiraz", it was perceived that there is no significant difference on total scores of critical thinking of students within Payame Nour University of Shiraz (Mehrabi et al. 2011). In a research entitled "overview of the extent of tendency to critical thinking among the bachelor nursing students in universities of medical sciences and Islamic Azad university of Yazd", it was deduced that 81.8% of the nursing students under study are subjected to critical thinking (Barkhordari. 2011).

In a research entitled “comparison of critical thinking skills among the first and the last semester bachelor degree’s students in the selected fields of the universities of medical sciences across Tehran”, it was deduced that there is a significant difference between mean of scores of the first and last semester students at the field of nursing in Shahid Beheshti University of Medical Sciences and Health Services and midwifery field in Iran University of Medical Sciences (Khoda moradi, 2011).

In a research entitled “a comparative study on critical thinking skills and tendency to critical thinking among veteran and non- veteran students in Guilan”, it was deduced that there is a significant difference on the sub-scale of reality-seeking in the score of tendency to critical thinking among veteran and non- veteran students and there is a more positive tendency in the context of maturity among veteran students (Mahboubi et al. 2012). Furthermore, in another research, findings indicated that the consolidated group counseling and analysis of mutual behavior have had a positive effect on general scale of control of emotions and subscales of anger, depression, anxiety and positive affect (Tarfie, 2013).

Acton et al.(2000) in a research displayed that training management and control of emotions causes increasing communication skills, problem resolving skills and increasing sense of empathy in these individuals. On the other hand, with regard to the studies, training critical thinking causes increasing the motivation to learning, acquiring problem resolving skills, decision making and creativity. Further, critical necessitates as a key component in mental health (Nardi et al, 1997), because the problems related to health raise disorder in attention and disturb the thinking process of students (Jain and Dowson, 2009). The students who think and focus on problems are adjusted with various successes, enjoyed better mental health (Thoyts, 1995). In other words, the students with deviated thoughts have less control on their life and less mental health (Gotlib et al, 1993). With regard to significance of relationship between critical thinking and control of emotions, evaluation and study of the effect of educational programs to develop critical thinking and its relationship with control of emotions seem essential. In this regards, the researcher intended to conduct a study to determine the relationship between critical thinking skills and control of emotions among the students in field of software within Borujerd technical and vocational college-girls branch.

Research Method

The present research as a descriptive- correlative survey was conducted aiming at investigating the relationship between critical thinking skills and control of emotions among the students in field of software within Borujerd technical and vocational college-girls branch. The statistical population (140) consists of all the students at the field of child coaching within Borujerd technical and vocational college-girls branch at the second semester 2014. The sample group (103) has been selected via simple random sampling method based on Morgan table. Data collection instruments include California Critical Thinking Skills Test; Form B (CCTST) and Emotion Control Questionnaire (ECQ). Further, the obtained data were analyzed using software SPSS 22, Pearson correlation coefficient and regression analysis. Data collection instruments included two questionnaires below:
California Critical Thinking Skills Test; Form B (CCTST)

This test is considered as a developed instrument to measure critical thinking skills in the students, which consist of 34 questions which some are 4-point questions and some 5-point. This questionnaire has been designed in five areas of cognitive skills of critical thinking including Analysis, inference, inductive reasoning, deductive reasoning and evaluation. To design this questionnaire, a general area of knowledge which is available simply in the primary and high schools and as the result of maturity has been assumed. No content knowledge for a specific field is required to give response to the questions in the questionnaire (Higuchi et al. 2002). In this questionnaire, a score belongs to the person for any proper response and the sum of proper responses develops the person’s score. Minimum and maximum score equals to 0 and 34, respectively. The scores in analysis, inference, inductive reasoning, deductive reasoning and evaluation sections have been calculated with 9, 11, 16, 14 and 14 scores, respectively (Higuchi and Donald, 2002). California Critical Thinking Skills Test; Form B (CCTST) enjoys strong content validity, because it has been developed based on the definition for the critical thinking proposed by American Philosophical Association and University of California. Researchers have determined reliability of form B using Kuder-Richardson formula 20(Facion and Facion , 1993). Validity, reliability and normalization of this test have been examined by Khalili in Iran, which reliability of test has been calculated via Kuder-Richardson formula 20(Khalili et al. 2004). After selecting the sample group, the researcher has given concise and necessary explanations about aims of research and how to give response to the questionnaire; then the sample group filled the questionnaires in a calm environment with presence of the researcher during 45 minutes.

Affective Control Scale (ACS)

This questionnaire consists of 42 questions aiming at evaluating the ability to control emotions and its subscales including anger, depression, anxiety and positive affect. Using this scale is recommended to the age group above 15 years old. 7-point Likert scale has been used to give response to this questionnaire ranging from totally disagreed (1) to totally agreed (7). The response to the items 4, 9, 12, 16, 17, 18, 21, 22, 27, 30, 31 and 30 are scored inversely, such that score 7 is given to the totally disagreed response and score 1 is given to the agreed response. Among 42 questions in this questionnaire, 8, 8, 13 and 13 items associate to anger, depression, anxiety and positive affect. High score in this questionnaire indicates inability in control of emotions (Ghaderi et al. 2010). Internal consistency and re-test for general

score of scale, subscale of anger, subscale of depression, subscale of anxiety and subscale of positive affect were obtained equal to (0.78, 0.94), (0.73, 0.72), (0.76, 0.91), (0.77, 0.89) and (0.66, 0.84)(Williams et al, 1997). Further, reliability coefficient of control of emotions was measured by Dehsh(2009) in a sample group consisting of 200 secondary grade students, indicating the results as follows:

Value of Cronbach's alpha in control of emotions, anger and positive affect was obtained equal to 0.84, 0.53 and 0.60, indicating appropriateness of control of emotions in research works. Further, examining the validity of scale by Dehsh(2009) indicated that another index was used to measure validity of internal consistency in addition to the content validity which was made by the experts; in this measurement, any scale which is measured via subscales is also measured via total scale, thus a strong significant correlation is expected between total score of scale and each of subscales. The obtained values are as follows: the correlation coefficient between control of emotions and subscale of anger equals to 0.71 and the correlation coefficient between control of emotions and positive affect equals to 0.67; further it can observe that all the observed coefficients are significant at confidence level(0.99). Therefore, validity of scale can be confirmed in this study(Dehsh, 2009).

Findings

The participants consist of 103 students at the field of software. All the students were girl with associate degree. As mentioned above, the high score in this questionnaire indicates inability in control of emotions. In this regards, the students enjoyed lower depression in the subscales of control of emotions. In other words, students have more control on their depression, and then they have in turn more control on their anger, positive affect and anxiety. Further, the highest mean relates to analysis and the least mean relates to inference in the critical thinking skills.

Table 1. mean and standard deviation of critical thinking and control of emotions and its components

Variables	M	SD
critical thinking		
Analysis	5/19	1/54
evaluation	4/18	2/60
inference	2/70	1/31
inductive reasoning	4/48	1/94
deductive reasoning	3/50	1/73
control of emotions		
Anger	34/06	6/82
Depression	31/94	10/67
Anxiety	43	9/80
Positive affect	35/57	7/37

Findings in table 2 indicate that there is the highest correlation ($p=0.000$, $r=-0.54$) between anger and critical thinking and the least correlation ($p=0.002$, $r=-0.31$) between anxiety and critical thinking.

Table 2. Results from correlation coefficients for the subscales of control of emotions and critical thinking

subscales of control of emotions		critical thinking
Anger	Pearson correlation coefficient	-0/54**
	sig	0/000
	no	103
Depression	Pearson correlation coefficient	-0/44**
	sig	0/000
	no	103
Anxiety	Pearson correlation coefficient	-0/31**
	sig	0/002
	no	103
Positive affect	Pearson correlation coefficient	-0/52**
	sig	0/000
	no	103

($P<0/01$)**

As observed in table 3, control of emotions and its subscales except for evaluation have no relationship with components of critical thinking. Findings from this table indicate that subscale of anxiety has the highest correlation ($P=0/000$, $r= -0/74$) with evaluation and positive affect has the least correlation ($P=0/002$, $r= -0/30$) with evaluation. On the other hand, there is a significant correlation between evaluation and control of emotions ($P=0/000$, $r= -0/72$).

Tale 3. Results from correlation coefficients for the critical thinking and control of emotions and its subscales control of emotions and its subscales Evaluation

control of emotions and its subscales		Evaluation
Anger	Pearson correlation coefficient	-0/63**
	sig	0/000
	no	103
Depression	Pearson correlation coefficient	-0/60**
	sig	0/000
	no	103
Anxiety	Pearson correlation coefficient	-0/74**
	sig	0/000
	no	103
Positive affect	Pearson correlation coefficient	-0/30**
	sig	0/002
	no	103
control of emotions	Pearson correlation coefficient	-0/72**
	Sig 0/000	
	No	103

(P<0/01)**

Mean and standard deviation of total score of critical thinking equaled to 12/59±2/72 and mean and standard deviation of total score of control of emotions equaled to 152/93±33. The study on data analysis in table 3 indicated that the value of correlation coefficient(r=-0.42) has been significant at P<0.01, thus there is a significant relationship between critical thinking skills and control of emotions.

Table 4. Correlation coefficient for the critical thinking and control of emotions

Variable	No	Mean	Standard deviation	Pearson correlation coefficient	Sig
critical thinking	103	12/59	2/72		
control of emotions	103	152/93	33	-0/42**	0/000

(P<0/01)**

To examine the relationship between critical thinking and control of emotions and determine contribution of critical thinking (predictor variable) in predicting control of emotions (criterion variable), simple regression analysis was used, which the results have been represented in table 5.

Table 5. Results from simple regression to predict control of emotions through critical thinking among students

Source of variations	SS	df	MS	F	R ²	P
Prediction	19969/48	1	19969/48			
Residual	91119/044	101	902/169	22/135	0/17	0/000**
Sum	111088/524	102				

(P<0/01)**

In this study, value of correlation coefficient between predictor variable and control of emotions equaled to -0.42 and value of R² equaled to 0.17, i.e. variance of control of emotions can be determined through critical thinking(P<0.01). to examine significance of correlation coefficient, results from variance analysis indicate that f-value is significant(F=22/135, P<0.01), thus critical thinking enables to predict control of emotions. Furthermore, with regard to table 6, significance of regression coefficient indicates that critical thinking(t=-4/70, P<0/01) enables to determine variance of control of emotions, i.e. the students with higher critical thinking level enjoy more control of emotions.

Table 6. Results relating to regression

Predictor variable	Regression coefficient	SE	Beta	t	p
Critical thinking	-5/13	1/09	0/42	-4/70	0/000**

(P<0/01)**

Discussion and conclusion

The present research intends to examine the relationship between critical thinking skills and control of emotions among the students in field of software within Borujerd technical and vocational college-girls branch. Results from Pearson correlation coefficient indicated that there is a significant correlation between critical thinking and control of emotions ($P < 0/01$, $r = -0/42$).

Anger ($P = 0/000$, $r = -0/70$) has the highest correlation with critical thinking and anxiety ($P = 0/002$, $r = -0/31$) has the least correlation with critical thinking. Further, findings indicated that there is just correlation between evaluation and subscales of control of emotions and total score of control of emotions. To give more explanation, there is the highest correlation between evaluation and anxiety and the least correlation between evaluation and positive affect. Further, there is a high correlation between evaluation and total score of control of emotions. It should be noted that to date no study has been conducted on the relationship between critical thinking and control of emotions. To explain the significant relationship between critical thinking and control of emotions, it can deduce that the students who enjoy more power of analysis, inference, reasoning and evaluation have more control on their emotions. Concerning the significant relationship between anger and critical thinking, it can mention anger as a controllable phenomenon so that it can control and regulate anger by increasing individuals' awareness from anger and training effective strategies (Shokouhi Yekta et al. 2008). Therefore, by increasing critical thinking level through improving reasoning, it can control anger better, because repeating internal dialogue causes the rational part of the brain overcomes the old parts that tend to war (Pour hossein denak, 2006). With regard to the studies, thinking styles have affected anger expression and inhibition styles, which this influence is due to the interaction between cognition and emotions (Motamedi et al. 2011). Concerning the significant relationship between anxiety and critical thinking, it is inferred that anxiety causes mental distress for the person and inhibits him from high level thinking, thus it can disturbs the critical thinking. This result is consistent with the results of the research by Barkhordari considering the fact that there is an inverse significant relationship between critical thinking and anxiety (Barkhordari, 2011). Concerning the significant relationship between positive affect and critical thinking, it can perceive that since positive affect is effective in decision making, it raises cognitive flexibility; thus the people who feel happy can raise associations among the thoughts. On the other hand, positive affect raises creative responses (Izan, 2006). As a result, from point of view of Lipman(2003), there is a casual relationship between creative thinking and critical thinking, such that creative thinking stimulates sense of criticism and acknowledgement in the individuals. Another finding of this research has associated to mean of scores of critical thinking among the students (11.64). This result is consistent with the result of the study by Khalili et al, mentioned that mean of critical thinking equals to 11.68(Khalili et al. 2004). Further, the study by Azdi et al with mean of critical thinking equal to 11.37 among the students in university of medical sciences in Bushehr is consistent with the study by Mahboubi et al with mean of critical thinking among non-veteran students equal to 12.45. yet, the results from the studies by Facion with mean equal to 16 for the last semester nursing students have not been consistent with the studies by McCarthy et al with mean of critical thinking equal to 17.26 among the last semester students.

Further, the studies in Iran indicate that 93% of the first semester students and 94% of the last semester students and 98.3% of the clinical nurses have poor ability for critical thinking, deduced that there is no significant difference on critical thinking between the first semester and last semester students(Barkhordari, 2008). With regard to low score of critical thinking in internal studies, it can perceive that the students have not the necessary critical thinking skills or they have not acquired them during their education, because students' critical thinking abilities during education do not come to realize without professors' aid, listening to lectures and reading books(Myres, 2012). For this, lack of favorable training methods by the faculty members to improve critical thinking can be one of the reasons for lack of significant difference in scores of critical thinking. In next finding, 0.34 of variance of control of emotions can be determined through critical thinking, i.e. it can predict control of emotions through critical thinking ($P < 0.01$). To justify this, it can deduce that it can predict extent of control of emotions through high levels of thinking. The major limitation of this research was conducting it on females, so that it must take precaution in generalizing the results to the males. With regard to findings of this research, it is suggested to conduct further research on subject of research on various courses of study including bachelor degree, master degree and PhD so as to take precaution in generalizing the results. Further this study must be conducted on males and the results must be compared with each other. With regard to the results from the present study, critical thinking plays a major role in control of emotions. In other words, with regard to the significant relationship between critical thinking skills and control of emotions, it can deduce that improvement in critical thinking process results in increasing control of emotions. Therefore, it is suggested to the authorities and planners to pay a particular attention to growth of critical thinking due to lower score of critical thinking in internal studies.

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