

Available online at www.sciencedirect.com**SciVerse ScienceDirect**

Procedia - Social and Behavioral Sciences 82 (2013) 51 – 56

Procedia
Social and Behavioral Sciences

World Conference on Psychology and Sociology 2012

The Effect of Teaching Critical and Creative Thinking Skills on the Locus of Control and Psychological Well-Being in Adolescents

Rezaei Kargar, Flor ^{a*}, Ajilchi, Bita ^b, Kalantar Choreishi, Monir ^b,
Zohoori Zangene, Zohreh ^b

^a Dept. of Psychology, Faculty of Human Science, Central Tehran Branch, Islamic Azad University (IAU), Tehran, Iran

^b Dept. of Psychology, Faculty of Human Science, Science and Research Branch, Islamic Azad University (IAU), Tehran, Iran

Abstract

The purpose of this study is to examine the effect of teaching critical and creative thinking skills on the locus of control and psychological well-being in high school students. In an experimental study 40 students that were selected using random multilayer sampling, were divided into test and control groups. On pre-test stage, they responded to locus of control questionnaire of Rotter (1966), and Ryff scale of psychological well-being (1989). The tests were organized in group form. In later stages of research, the test group through 10 educational sessions (20 hours) was taught thinking skills (creative and critical) and it is noteworthy that no education was given to a control group. Upon completion of educational sessions, in post-test stage, both test and control groups were tested with California critical thinking skills test B (1990), Abedi creativity inventory (1996) and questionnaires of pre-test. Statistical method of independent *t*-test showed significant increase in creative thinking and critical thinking in post-test of the experimental group. Furthermore, Multivariate analysis of covariance (MANCOVA) showed a significant increase in internal locus of control and psychological well-being ($p < 0.05$).

© 2013 The Authors. Published by Elsevier Ltd. Open access under [CC BY-NC-ND license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

Selection and peer review under the responsibility of Prof. Dr. Kobus Maree, University of Pretoria, South Africa.

Keywords: Creative Thinking, Critical Thinking, Locus of Control, Psychological Well-Being, Adolescents.

1. Introduction

In general, creativity is defined as "the cognitive skill of offering a solution to solve a problem or doing useful or novel activity from ordinary" (Hwang, Chen, Dung, & Yang, 2007, p. 193, cited in Aizikovitsh-Udi & Amit, 2011). The process of creative thinking imparts the ability to generate the new ideas, to realize the hidden relationships or to make a unique and modified the order among appear unrelated factors. In other words, the creative thinking is not included only one kind of treatments (Piaw, 2010).

* Corresponding author: Rezaei Kargar, Flor
E-mail address: flor.rezaei@gmail.com

On the other hand, the word 'critical' means to understand the people and things around us and analyses our own thinking processes. Unfortunately criticizing ability is used just as limiting the thinking process of a person (Chaffee, 1988).

Halpern (1996) described critical thinking by using the cognitive strategies or skills to evaluate the probability of favorite behaviors. According to Ennis (1987), critical thinking is a reasonable, reflective, responsible and skilled thinking process which focuses on what to believe and what to do (Ivive, 2001).

Anderson et al. (2001, cited in Emir, 2009) focus on these features about critical thinking: defining assumptions, focusing on uncertainties, analyzing discussions, asking and answering questions and evaluating the reliability of sources. According to Grant (1988), critical thinking has eight characteristics which are: asking questions, defining problems, investigating evidences, analyzing biases and anticipations, avoiding from emotional judgments and over simplification, considering other comments, tolerating contradiction. The general skills which are recognized by using designing specific courses to instruct critical thinking skills and the infusion approach are two main approaches to promote the critical thinking (Swartz, 1992). In this study, we taught critical thinking skills with creative thinking skills according to the first approach.

Creative and critical thinking are both essential for adolescents in all aspects of mental health. Recently, many research have shown positive effect of creative and critical thinking improving on psychological variable such as: concepts of intelligence (Burke & Williams, 2012), problem solving (Hong et al., 2012), moods and emotions (Newton, 2012), mental health (Parisoz, 2010), Locus of control (Loghmani, 2010; Rashidi, 2005), general health (Rezaei Kargar, Ajilchi, & Inanloo, 2010), defense mechanisms and mental health (Rezaei Kargar, Ajilchi, & Kalantar Ghoreishi, 2012).

In this regard, current study wants to investigate the effect teaching of these thinking skills on locus of control and psychological well-being. In this regard, the hypothesis of the study is: Creative and critical thinking skills teaching to have a positive effect on locus of control and psychological well-being in adolescents.

2. Method

2.1. Procedure

Forty male students of 6th degree (fifteen years old) from the one high school in Tehran was chosen by using a random cluster sampling method which divided students into the control and test groups by random assignment. Then, the participants responded to locus of control scale and questionnaires of psychological well-being. Then, the test group through 10 educational sessions (20 hours, one session per week) was taught creative and critical thinking skills. Finally, both groups were tested with the critical thinking skills test, creativity inventory and questionnaires of pre-test. Data were analyzed by Multivariate Covariance analysis.

2.2. Measures

2.2.1. California Critical Thinking Skills Test form B (CCTST)

It is a multiple-choice instrument which includes the six subscales such as evaluation, analysis, inference, interpretation, explanation and self-regulation. The internal reliability was computed (0.78 to 0.84). Validity was calculated by correlating the CCTST with the Scholastic Aptitude Test verbal scores (correlation $\alpha = 0.55$) (Facione, 2006).

2.2.2. Abedi- Scumacher Creativity Test (O'Neil, Abedi and Spielberger, 1994)

This test is a multiple choice test which consists of the 60 questions and included the three-point scales of originality, flexibility, fluency or elaboration. Azumendi, Villa and Abedi (1996, as cited in Croypley, 2005) reported internal reliability of 0.61 to 0.75 for the four subscales.

2.2.3. Locus of Control Scale (Roterr, 1966)

The Locus of Control consists of 23 item questionnaire which extended by Rotter (1966). This test measures generalized hopes for the internal against external control of amplification. The people who have an internal locus of control do not need to the external rewards for their own treatments, in contrast, those who possess an external locus of control are believe in the external rewards which are outside of their control. The range of scores is between 0 and 2.3. The high score shows the external control and the low score revealed an internal control. In the Iranian samples, concurrent validity of the Locus of Control scale by using the Nowicki-Strickland Internal-External Control Scale (Nowicki & Duke, 1983) observed 0.39 (Movafagh, 1996, as cited in Yaryari, Moradi, & Yahyazadeh, 2007), and reliability of this scale using halving method was 0.81(Saboori Moghdam, 1993, as cited in Yaryari et al., 2007). In this study, coefficient alpha for this measure was 0.70.

2.2.4. Psychological Wellbeing inventory (RPWB)

The Ryff inventory (Ryff & Keyes, 1995) consists of either 84 questions and included a series of statements related to the six fields of psychological well-being like environmental mastery, autonomy, personal growth, purpose in life, positive relations with other people, and self-acceptance. The answers exhibited with the numbers of 1 to 6, that score of 1 indicating strong disagreement and 6 showing strong agreement. For all questions, the high total score indicates the high psychological well-being, and for each class, a high score indicates that the respondent has a mastery of that field in his/her life. In contrary, the low score exhibits that the respondent conflicts feel comfortable with that especial concept.

3. Results

Table 1. Descriptive statistics for depended variables

Variables	Test group				Control group			
	Pre-test		Post-test		Pre-test		Post-test	
	Mean	Sd*	Mean	Sd*	Mean	Sd*	Mean	Sd*
Locus of control	120.05	10.64	116.05	11.79	114.90	10.03	104.35	11.72
Psychological well-being	291.00	39.03	308.20	37.75	299.75	30.86	273.65	17.01

*Sd. = Standard deviation

As it is seen in Table 1, post-test scores of the test group have decreased in locus of control and increased psychological well-being.

Table 2. Independent t-test for creative and critical thinking between experimental and control groups

	Test group		Control group		t (38)	p <
	Mean	Standard Deviation	Mean	Standard Deviation		
Creative thinking	89.75	16.97	79.90	18.23	2.77*	.001
Critical thinking	10.80	2.35	7.60	2.76	3.95*	.005

p < 0.05

Table 2 showed that creative and critical thinking significantly increased in test group after teaching.

Table 3. Multivariate tests

Source	Value	F	Hypothesis df	Error sf	p<	Effect Size
Wilks' Lambda	.429	23.274	2	35	.0005	.571

Table 3 shows that there is a significant difference between test and control groups in depended variables.

Table 4. Differences before and after teaching

Source	Dependent Variable	Sum of Squares	Mean Square	$F(1,36)$	$p <$	Effect Size
Group	Locus of control	863.06	863.060	6.80	.013	.159
	Psychological well-being	4566.62	126.851			
Error	Locus of control	15279.46	15279.46	47.61	.0005	.569
	Psychological well-being	11553.95	320.94			

As table 4 shows, decreasing scores of Locus of control and increasing of psychological wellbeing scores in post test of the test group after teaching are significant in $p < .05$. Effect sizes of these variables respectively are 0.159 and 0.569. Using Cohen's instructions (1988) introduced 0.01, 0.06 and 0.14 as the small, medium and large effect sizes which the mentioned effect sizes are big.

4. Discussion

The findings of this research and relevant tables reveal that creative and critical thinking skills teaching have led to a significant decrease of locus of control and significant increase of psychological well-being at $p < 0.05$. The findings help verify the research hypothesis. The research findings are supported by Burke and Williams (2012), Hong et al. (2012), Newton (2012), Parisoz (2010), Loghmani (2010), Rashidi (2005), Rezaei Kargar et al. (2010), Rezaei Kargar et al. (2012).

Locus of Control (LOC) refers to an individual's personal believe that the events which carry out in life are either a result of effort and personal control, or outside forces like fate and luck. Understanding of negative and positive events as the results of one's own actions and thereby under one's own personal control is introduced as the internal LOC. In opposite, the external LOC refers to the perception of the negative or positive events unrelated to one's own behavior and are outside of the personal control (Locus of Control and Cardiovascular Health, 2004, cited in Graffeo & Silvestri, 2006).

Psychological well-being mentions to the positive mental health (Edwards, 2005). Research has shown that psychological well-being is a diverse multidimensional concept (MacLeod & Moore, 2000; Ryff, 1989; Wissing & Van Eeden, 2002, cited in Ismail & Desmukh, 2012) which is extended by the mixture of emotional arrangement, personality properties, identity and life experience (Helson & Srivastava, 2001).

As Harvey and Thomas (2004, cited in Graffeo & Silvestri, 2006) stated, LOC has been affiliated with psychological well-being and health. The internals with having a trend to accomplish better on academic tasks in comparison to the externals, and show more influence coping strategies which lead to better psychological regulation. These enviable properties decrease the negative health effects associated with highertress.

Higher levels of stress correlate with the external locus of control (Garber & Seligman, 1980), and Grob (2000) mentioned that stress often makes an individual understanding the situation as outside his/her coping capabilities; with continuous stress possessing a negative effect on psychological well-being. The people with an internal locus of control, with this believe that the situation is in his/her control, may get the same situation stimulating (Owusu-Ansah, 2008, cited in Stocks, Aprill, & Lynton, 2012).

It can be said that individual with the external locus of control are considerably less happy in comparison to the internal people. It is noticeable that the internals actively change their environments to take control of the events and to alter unsuitable positions (Kulshresta & Sen, 2006). In opposite, the externals feel weak to control their failures or achievements (Nielsen, 1995) and therefore, are unable to delete themselves from dissatisfactory positions (Kulshresta & Sen, 2006).

It seems that creative and critical thinking skills teaching improve analysis, evaluation, comparison, and innovation, autonomy, and control abilities, and then, these abilities impact the psychological well-being and the locus of control. To extend the obtained results of this research, it is suggested to replicate this research on both girls and boys in different school levels.

In conclusion, this research revealed that creative and critical thinking skills teaching is a useful way that not only enhance internal locus of control but also improves psychological well-being. Therefore, thinking skills teaching programs are offered to schools.

References

- Aizikovitch-Udi, E., & Amit, M. (2011). Developing the skills of critical and creative thinking by probability teaching. *Procedia Social and Behavioral Sciences*, 15, 1087-1091.
- Burke, L. A., & Williams, J. M. (2012). The impact of a thinking skills intervention on children's concepts of intelligence. *Thinking skills and creativity*. In press.
- Chaffee, J. (1988). *Thinking critically* (2nd ed.). Boston, MA: Houghton Mifflin.
- Cohen, J. W. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Cropley, A. J. (2005). *Creativity in education & learning: A guide for teachers and educators*. Oxon: Routledge Falmer.
- Edwards, S. D. (2005). A psychology of breathing methods. *International Journal of Mental Health Promotion*, 7(4), 28-34.
- Emir, S. (2009). Education faculty students' critical thinking disposition according to academic achievement. *Procedia Social and Behavioral Sciences*, 1, 2466–2469
- Ennis, R. (1985). Goals for critical thinking curriculum. In A. Costa (Ed.). *Developing minds: A Heorse book for teaching thinking: Alexandria*. (pp. 54-57). VA: Association for Supervision and Curriculum Developments.
- Facione, P. A. (2006). *Critical thinking: What it is and why it counts*. Millbrae, CA: California Academic Press.
- Garber, J., & Seligman, M.E.P. (Eds.) (1980). *Human helplessness: Theory and applications*. New York, NY: Academic Press.
- Graffeo, L. C., & Silvestri, L. (2006). Relationship between locus of control and health-related variables. *Education*, 126, 593-596.
- Grant, G. E. (1988). *Teaching Critical Thinking*. New York: Praeger Publishers.
- Halpern, D. F. (1996). *Thought and knowledge: An introduction to critical thinking*. New Jersey: Lawrence Erlbaum.
- Helson, S., & Srivastava, S. (2001) Three paths of adult development: Conservers, seekers, and achievers. *Journal of Personality and Social Psychology*, 80, 995 - 1010.
- Hong, J. C., Hwang, M. Y., Chen, Y. J., Chen, M. Y., & Liu, L. C. (2012). Using eight trigrams (BaGua) approach with epistemological practice to vitalize problem-solving processes: A confirmatory analysis of R&D managers. *Thinking skills and creativity*. In press.
- Ismail, Z., & Desmukh, S. (2012). Religiosity and psychological well-being. *International Journal of Business and Social Science*, 3(11), 20-28.
- Ivie, S. D. (2001). Metaphor: a model for teaching critical thinking. *Contemporary Education*, 72 (1), 18-23.
- Kulshresta, U., & Sen. C. (2006). Subjective well-being in relation to emotional intelligence and locus of control among executives. *Journal of the Indian Academy of Applied Psychology*, 32, 93-98.
- Loghmani, H. (2010). The effect of critical thinking skill teaching on locus of control and cognitive inconsistency. (Master's Thesis). Payam Noor University of Tehran.
- Nelson, E. S., & Mathias, K. E. (1995). The relationships among college students locus of control, learning styles and self-prediction of grades. *Education Research and Perspectives*, 22, 110-117.
- Newton, D. P. (2012). Moods, emotions and creative thinking: A framework for teaching. *Thinking skills and creativity*. In press.
- Nowicki, S., & Duke, M. P. (1983). The Nowicki-Strickland life-span locus of control scales: Construct validation. In H. M. Lefcourt (Ed.), *Research with the locus of control construct* (Vol. 2, pp. 9-51). New York: Academic Press.
- Parisozz, A. (2010). *Effect of critical thinking teaching on mental health and academic achievement in female student of high school*. (Master's Thesis). Allameh Tabatabaei University of Tehran.
- Piaw, C. Y. (2010). Building a test to assess creative and critical thinking simultaneously. *Procedia Social and Behavioral Sciences*, 2, 551-559.
- Rashidi, A. (2005). The relationship of creativity and attitude to self-creativity with locus of control in students of first grade of high school in Arak city. (Master's Thesis). Shahid Beheshti University of Tehran.
- Rezaei Kargar, F., Ajilchi, B., & Inanloo, F. (2010). The effect of creative and critical thinking skills teaching on general health of adolescents. *Contemporary psychology*, 5 (Suppl.), 385-387.
- Rezaei Kargar, F., Ajilchi, B., & Kalantar Ghoreishi, M. (2012). *The effect of creative and critical thinking skills teaching on defence styles and mental health in adolescents*. Poster session presented at 1st International Conference on Time Perspective, Coimbra.
- Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs*, 80, 1–28.
- Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*, 57(6), 1069-81.
- Stocks, A., Aprill, K. A., & Lynton, N. (2012). Locus of control and subjective wellbeing - a cross-cultural study. *Problem and Perspective in Management*, 10(1), 17-25.
- Swartz, R. J. (1992). Critical thinking, the curriculum, and the problem of transfer. In D. N. Perkins, J. Lochhead, & J. Bishop (Eds.), *Thinking: Teaching*. *Procedia Social and Behavioral Sciences* 15, 1087–1091.
- Yaryari, F., Moradi, A., & Yahyazadeh, S. (2007). The relationship between emotional intelligence and Locus of control with psychological well – being among students at Mazandaran University. *Journal of Psychological Study*, 3(1), 21-40.