

The Effectiveness of an Emotional Intelligence Training Program and its Components on the Creativity and Academic Achievement of High School Students

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Background: Creativity and academic progress are main issues of the educational system.

Objectives: For improving student achievement and increasing creativity and innovation, various methods have been proposed.

Materials and Methods: This study enrolled 48 first year high school students. Participants were randomly assigned to experimental and control groups. After a description of the research objectives and obtaining participant consent, we used a researcher-generated questionnaire to collect data. Before any intervention we retrieved participants' grade point averages (GPA) from the first semester in order to verify academic progress of both groups. At baselines, both groups were assessed with an Emotional Intelligence Questionnaire (Bar-On) and Abebi's creativity test. The experimental group received a three-month training program on emotional intelligence that was conducted in 10 sessions, for an average of 30 minutes per session. The control group did not receive any special training. At the end of the training program we administered the same questionnaires in both groups as a post-test. For data analysis, analysis of variance, correlation and regression analysis, and the t-test were used.

Results: This method significantly increased students' academic progress and creativity. The emotional intelligence factor alone predicted 32% ($R^2 = 0.32$) of variance related to creativity and 18% ($R^2 = 0.18$) of variance related to students' educational progress.

Conclusions: The results of this study can be used as a method for increasing and improving student achievement and increasing creativity in high school students. For improving student achievement and increasing creativity and innovation, various methods have been proposed.

Keywords: Emotional intelligence; Creativity; Academic Achievement

1. Background

Currently, students have to learn creative thinking skills in order to generate new ideas, make proper decisions and solve problems. It is the responsibility of educational centers and schools to provide proper fields for the growth and fostering of creativity and innovation. Sternberg defines creativity as the ability to make new thoughts at higher levels, which is a mixture of power, innovation, flexibility and sensitivity towards the available beliefs. Creativity gives the person the ability to think about new findings through new ideas (1). Torrance suggests that creativity is a combination of four main factors: fluency which is the capacity to generate numerous ideas; elaboration or the capacity to note details; originality which is the capacity to make new and unusual ideas; and flexibility or the capacity to make numerous different ideas or methods (2). A previous study has also found that individuals should learn

proper thinking methods in order to become creative and therefore they have the ability to show their creativity. Hence, The question asked is regarding the most effective method for fostering creativity. Although different methods have been suggested, no research has been devoted to teach emotional intelligence in order to foster creativity. Golman believes that emotional intelligence includes the ability to motivate oneself, resist frustrations, be empathetic and hopeful, flexible and have the ability to solve problems. In his opinion emotional intelligence is the capacity to recognize self and other's feelings and to motivate and manage emotions to achieve the goals (3, 4). According to Mayer and Salovey, emotional intelligence is a positive self-image, a feeling of independence and the capacity for self-actualization. Its external elements include interpersonal relations and a sense of responsibility. Emotional intel-

Implication for health policy/practice/research/medical education:

All authors have participated equally in this study.

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ligence also consists of an individual's capacity to solve problems and be flexible, fluent, manage emotions and have a strong motivation in order to reach the results (5). According to these researchers, emotional intelligence includes four main components. Emotional perception and expression includes recognition and verbal and non-verbal information that enters into the emotional system. Facilitation of thought through emotions entails utilizing emotions as part of cognition, such as creativity and problem solving. Emotional understanding includes cognitive processing of emotions about an individual and other's feelings. Emotional management is considered to be the control and management of emotional facts in one's self and others (6, 7).

Facilitation of thought through emotion is the second component of emotional intelligence. Facilitation of emotions affects thinking and learning and can be related to creativity and innovation, which is the theme of this paper. In addition, emotions can create priority in cognitive systems in a way that enable the individual to select from different emotions and emotional states, and concentrate on them (8). On the other hand, emotional intelligence and its components are considered key factors in knowledge growth and students' educational success (9,10). Researchers have stated that gifted students have higher emotional intelligence than normal students (11). Besharat et al. have shown increases in math skills in high school students who were taught emotional intelligence. They reported which emotional intelligence trainings were effective on emotional growth, problem-solving ability, increased productivity and students' educational function (9). However no research has reported the effectiveness of teaching emotional intelligence and its components on creativity and academic achievement.

2. Objectives

Therefore, the present study aimed to determine the effects of teaching emotional intelligence on student creativity and attempted to answer the following questions.

Do emotional intelligence training courses increase student's creativity?

How can we express the effects of emotional intelligence training on creativity?

Is teaching emotional intelligence and its components effective on student progress?

How can we express the relation between academic achievement and emotional intelligence?

How can we express the relation between creativity, emotional intelligence and its components?

3. Materials and Methods

The present study was conducted during 2010-2011 in Shahid Beheshti center of Exceptional Talents, in Shah-

rood, Iran. We chose 48 first year high school students who were randomly divided into the experimental and control groups. This study was conducted with an experimental research method. Prior to experimental interventions, both groups were evaluated according to the Emotional Intelligence Questionnaire (Bar-On) and Abebi's creativity test. The experimental group participated in an emotional intelligence-training course which was conducted over a three-month period and comprised approximately ten, 30-minute sessions. The control group received no intervention. At the end of the three-month period, both groups were given a post-test that consisted of the above mentioned questionnaires. Complete information was collected to re-investigate academic achievement and the students' scores. Students' final scores were investigated. For data analysis, we used analysis of covariance (ANCOVA (correlation, regression analysis and the t-test, which were computed through SPSS version 16. Significance of data was at the 0.01 (α) statistical significance level.

3.1. Evaluation Tools

3.1.1. Emotional Intelligence Questionnaire (Bar-On)

This questionnaire includes 117 questions and 15 scales, which was designed and constructed by bar-on. We administered this questionnaire as a pre- and post-test for both groups. The components of this scale include emotional self-awareness, assertiveness, self-esteem, self-actualization, independence, empathy, social responsibility, interpersonal relations, reality testing, flexibility, problem solving, stress tolerance, impulse control, optimism and happiness (12). This questionnaire was standardized in 2003 by Dehshiri on university students in Tehran. The mean internal consistency of its subscales was 0.73 and the mean retest coefficient for the subscales was 0.73 after one month. In this study the mean reliability based on Cronbach's alpha was 0.87.

3.1.2. Abebi's Creativity Test

Abedi developed his creativity test using Torrance's test. He employed this test to evaluate four underlying creativity traits that included mental-verbal, flexibility, originality and elaboration in 1997. The new test version has 56 questions. The reliability of this test was 0.75 based on Cronbach's alpha (13).

3.1.3. Emotional Intelligence Training Course

The emotional intelligence training course is a structured psycho-educational intervention used to increase emotional intelligence skills. This course is 2 to 6 months long where four processes are used to teach educational intelligence: self-awareness, self-management, social awareness and relationship management

(14). The emotional intelligence course protocol was retrieved from Bradberry (14). To teach this course, ten training sessions were held as workshops. In these sessions, the considered content was taught mainly through role playing and weekly practices for the students.

4. Results

The results showed that the training course significantly increased the experimental group's creativity ($P < 0.001$). This course also significantly increased emotional intelligence in the experimental group as seen in Table 1. The results showed that by increasing emotional intelligence, academic achievement also increased.

In addition, the results showed that the independent variable (emotional intelligence) most significantly impacted a number of the emotional intelligence scales such as problem solving, independence, stress tolerance, self-actualization, reality testing, optimism, interpersonal relations, self-esteem, flexibility and social responsibility ($P < 0.001$, Table 3).

On the other hand, covariance analysis results (Table 2) showed that although the emotional intelligence training course significantly impacted flexibility, fluency and originality scales of creativity ($P < 0.001$), there was no significant effect on elaboration. The results of the table show that this training course mostly impacted flexibility.

Table 1. The Results of the t-Test for Academic Achievement, Creativity and Emotional Intelligence in Both Groups

Groups	Test Stage	Number, N	Mean, M	Standard Deviation, SD	P Value
Control	-	-	-	-	-
Academic achievement	Pre	24	17.06	0.61	0.476
-	Post	24	17.13	0.59	-
Emotional intelligence	Pre	24	316	21.19	0.526
-	Post	24	313	21.07	-
Creativity	Pre	24	133.4	12.20	0.471
-	Post	24	138.2	10.70	-
Experimental	-	-	-	-	-
Academic achievement	Pre	24	17.12	0.71	< 0.001
-	Post	24	18.61	0.82	-
Emotional intelligence	Pre	24	312	21.72	< 0.001
-	Post	24	381	26.38	-
Creativity	Pre	24	130.2	12.21	< 0.001
-	Post	24	161.7	14.67	-

Table 2. Summary of the Results of Covariance Analysis for Creativity Components in the Test and Control Groups

Scales	Number, N	P Value	Eta Squared
Flexibility	24	< 0.001	0.392
Fluency	24	< 0.001	0.346
Elaboration	24	0.349	0.058
Originality	24	< 0.001	0.326
Total creativity	24	< 0.001	0.419

Table 3. The t-Test Results Comparing Pre-and Post-Test Changes in Both Groups According to Emotional Intelligence Components

	Control (n = 24)		Experimental (n = 24)		Mean Difference	P Value
	Pre-Test, Mean \pm SD	Post-Test, Mean \pm SD	Pre-Test, Mean \pm SD	Post-Test, Mean \pm SD		
Problem-solving	16.12 \pm 2.2	17.14 \pm 1.85	15.18 \pm 1.98	23 \pm 2.02	8.83	0.000
Happiness	18.22 \pm 1.9	19.18 \pm 2.5	17.71 \pm 1.22	19.79 \pm 1.88	1.702	0.075
Independence	16.77 \pm 2.72	18.22 \pm 2.11	16.27 \pm 2.12	23.21 \pm 2.4	7.22	< 0.001
Stress tolerance	17.98 \pm 1.85	16.22 \pm 1.98	17.14 \pm 1.85	22.2 \pm 2.01	5.42	0.01
Self-actualization	18.55 \pm 2.44	17.45 \pm 1.45	17 \pm 1.55	22.24 \pm 1.74	5.32	0.01
Self-awareness	17.55 \pm 1.87	18 \pm 1.98	16.92 \pm 2.1	23.52 \pm 2.2	7.69	< 0.001
Reality testing	16.22 \pm 1.09	18 \pm 2.45	15.5 \pm 1.98	21.55 \pm 2.42	6.701	< 0.001
Optimism	14.49 \pm 2.1	15.78 \pm 2.41	15.85 \pm 2.35	23 \pm 2.1	8.01	< 0.001
Interpersonal relations	17.52 \pm 2.45	16.78 \pm 2.05	17.5 \pm 1.95	22.44 \pm 2.4	6.471	< 0.001
Self-esteem	18.12 \pm 2.63	18.99 \pm 2.44	17.42 \pm 2.01	24.4 \pm 2.1	7.207	< 0.001
Impulse control	17.22 \pm 2.33	18.22 \pm 2.11	19.3 \pm 1.88	21.2 \pm 1.98	2.31	0.047
Flexibility	16.45 \pm 2.77	15.22 \pm 1.98	17.4 \pm 2.5	26.5 \pm 2.85	9.27	0.000
Social responsibility	19.2 \pm 2.44	18.22 \pm 1.49	18.8 \pm 2.2	26.75 \pm 2.41	8.17	< 0.001
Empathy	19.75 \pm 1.85	19 \pm 1.77	18.52 \pm 1.88	20.14 \pm 2.14	2.14	0.049
Assertiveness	18.22 \pm 2.34	18.45 \pm 2.21	17.77 \pm 2.05	21.01 \pm 1.87	3.17	0.039
Problem-solving	16.12 \pm 2.2	17.14 \pm 1.85	15.18 \pm 1.98	23 \pm 2.02	8.83	0.000
Happiness	18.22 \pm 1.9	19.18 \pm 2.5	17.71 \pm 1.22	19.79 \pm 1.88	1.702	0.075
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Assertiveness	18.22 \pm 2.34	18.45 \pm 2.21	17.77 \pm 2.05	21.01 \pm 1.87	3.17	0.039

5. Discussion

The results showed that emotional intelligence increased students' creativity. The most impact was on flexibility, fluency, and originality. These results were consistent with those reported by Olatoye who showed a relationship between the main factors of emotional intelligence and creativity (15). Our results also supported a study by Averill who showed that showing emotions in creative thinking were the main factors. He has stated that flexibility and fluidity of thinking are the main features of creative thinking (16). According to Fuchs, a per-

son could increase their creativity under the appropriate psychological and emotional conditions. (17). Emotional intelligence can impact the thought process, concentration, and a realistic understanding of the situation. Many studies proved that creative people are flexible, innovative and have high concentrations which are in line with the properties and traits of emotional intelligence. These results, along with those of Fuch and Andolatoy who have shown that problem solving, independence, and flexibility are very important in suggesting effective responses to situations and events. Emotional readiness creates increased innovation and individuals with higher emo-

tional intelligence show more creativity (15, 17). Haghani et al. have also shown that creative thinking and critical thinking are highly correlated with emotional intelligence (18). It can be said that positive creation, self-awareness and flexibility as characteristics of individuals with high emotional intelligence enable people to be more skillful in creative expression and new ideas and seeing events with different viewpoints. In fact, emotional intelligence changes the individual's viewpoint toward themselves and events. The results showed that the suggested training course could increase the students' emotional intelligence and academic achievements. These results were consistent with the results obtained from Mayer et al. who investigated the emotional intelligence of gifted students. They showed that students with higher emotional intelligence succeeded more in education. Students could manage their feelings and emotions and schedule their work responsibly (11). Other studies that investigated the relationship between emotional intelligence and academic achievement reported that students with higher emotional intelligence allocated more time for academic achievements. These students created the required enthusiasm to acquire knowledge. They were able to manage their negative feelings about subjects (19-21). The results of this study showed that emotional capability of the students have improved their educational function in different ways. Students who can face their emotions intelligently are more self-possessed, have more self-confidence, try harder to learn, are self-actualized and control their emotions and stresses in order to reach their goals. In other words, emotional intelligence plays a mediator role or modifier in relation to academic achievement. Altogether, the results of this study have a theoretical and practical content. Theoretically, the results of this study verify the hypothesis of emotional intelligence. Practically, the research findings ask the educational practitioners, parents and related organizations to pay more attention to emotional and social growths in academic achievement; creativity and innovation of students increases with this growth. On the other hand, emotional intelligence in the form of group training is a model that increases creativity and educational growth of students. In this study, we have presented an emotional intelligence training course in group-sessions independent from classes and educational content. Perhaps it can be accompanied by educational content throughout the year. We propose that special emotional intelligence courses be offered in schools according to the present model. In this study we have not controlled for variables such as intelligence, gender and family conditions of the students. We propose that other researchers investigate and report these findings for different ages and gender. On the other hand, additional research is needed to generalize these findings as this study has been conducted on male students from a gifted center.

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Author's contribution

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