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## COMPARISON OF THE EFFECT OF THREE METHODS OF CREATIVITY DEVELOPMENT IN ELEMENTARY STUDENTS IN TEHRAN CITY



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### Abstract

**Objectivity:** This research was conducted with the objective of examining the effect of three methods of creativity development (brain storming, forced association and synectics) on creativity development in elementary students in Tehran city. **Method:** The present study was a pretest-posttest experimental design with control group. To measure the dependent variable, creativity, Torrance Tests of creativity thinking (Form B) were used. In this study 160 students (80 boys, 80 girls) were randomly selected and divided into four groups (brain storming, forced association, synectics and control group). **Results:** Results revealed significant difference between pretest and posttest scores of all groups except the control group (brain storming  $P < 0.01$ , forced association  $P < 0.05$ , synectics  $P < 0.01$ ). Also, the difference between the methods of creativity development was not significant. In other words, none of the creativity methods were superior to the others. However, there was a significant difference between the control groups ( $P < 0.001$ ). **Conclusion:** Regardless of the method, creativity training can lead to an increase in students' creativity.

*Keywords:* Creativity, development, students

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## 1. Introduction

Creativity is man's best need in all the life's dimensions and a jump in his/her thinking. Creativity includes combination of known ideas. The strength of the human being's brain enables him/her to enjoy the talent for creativity and it is because of the same talent that the scope of knowledge is increasing everyday more than yesterday. Creativity is one of the better specifications of human beings. In the current era, one of the most important goals of the progressive education of the world is educating creative and innovative learners (Saif, 2001). Balzac (2006) has studied the neurology of creativity and has reached the conclusion that creative innovations need simultaneous activity and connection of some parts in the brain that are not ordinarily in a strong contact with one another. Gardner (1982) believes that creativity starts from young ages and in his view, pre-school children have a lot of creative capabilities, but when they start school, they begin learning how to read and write and in order to have coordination with others, they learn how to follow and obey. That is why their creativity decreases. Therefore, we have to think of ways that will not decrease the creativity in children.

According to the belief of most researchers, the traditional methods of education not only do not help with the growth of creativity, but in fact it is considered to be an obstacle (Berg, 2000). Therefore, one of the main tasks of teachers is to create, as much as possible, a definite and appropriate atmosphere in the classroom and take advantage of active and discovering teaching methods in the classroom and help the students to utilize their creative power.

In Torrance's (2002) idea, creativity is considered to be a process that is evolved collectively. He believes that all people are creative and it does not necessarily belong to just smart people. Creativity can be increased and/or created in different ways. Torrance looks at creativity as an evolution and considers factors such as modelling, motivation, methods of production of education in the formation of creativity to be effective.

Creativity means creating ideas that are new and valuable even for the creator of those ideas. In Renzveli's opinion (2002), creativity is a combination of innovation, flexibility and sensitivity from different points of views as such that the individual can think about different and generating results, apart from the results of unreasonable thoughts leading to things such as personal and others' satisfaction.

Some of the psychologists emphasize on the outcome of the creator's action. As a result, the outcome of creativity is important which has to have characteristic such as innovation, value and solidarity. Another group of psychologists put an emphasis on the creativity. The individuals consider it as a process of characteristics such as fluidity, flexibility and newness

and believe that the creative process has several stages. For example, Wallace has mentioned four stages of preparation, latency, intuition, and stability for creativity.

- preparation: In this stage, all the sides of the problem will be taken into consideration and the mentioned problem will be identified and the truths related to it will be collected.
- Latency: In this stage, there is some mental processes that connect the new information with the past ones. Some types of new organization of information take place without the individual's direct awareness.
- Intuition: in this stage, a pleasant idea appears which is called "the aha phenomenon". At this stage, the creative person will suddenly learn the ideas of the solutions to the problem.
- Stability: In this stage, the idea that took place in the previous stage will be evaluated to reveal its credibility or the lack of it (Mirzaeeyan, 2004).

Today, the experts consider creativity as a fundamental knowledge for any change and innovation. According to Brolin (1999), the creation of new ideas and the innovative production are some of the cognitive characteristics of people. Having such a view of creativity has been interpreted as an important factor in the acceleration of man's scientific and innovative ideas. Studies show that the center of gravity for the new movements, in future, will be the creation and the degree of exploitation of the creative mind. Based on this, one of the serious and predictive challenges in future will be the degree of taking advantage of minds and creative personalities in different scientific, research, innovative, and hygienic scopes. Reehamer and Brolylin (1999) by looking at this issue, critically, believe that creativity has had three major trends from 1950 to 1999. the first trend related to the study of personality. They believe that the researches about innovation have predominantly been over the personality of innovative individuals during the 1950s. During this time, the analysis of creative individuals' personality characteristics is the topic of most creative researches.

The second trend is related to the study of cognition in the field of creative individuals' intellect and comprehension. Despite that, one of the major changes that came into existence in this stage was the change of approach in the psychometry of creativity such as the one that Torrance discussed during the 1960s and 1970s. These major changes were geared towards researchers that resulted into the awareness of the innovative mind based on the cognitive and intellectual capabilities. In the third stage, the stimulation and education in creativity were discussed (Dolan & Metcalfe, 2008).

## **2. Problem Statement**

Since the past, there has always been this question as to whether creativity is the common characteristics among people or not? To answer this question, some of the critics believe that creativity has been entrusted in some people and the rest lack such thing. This means that creativity is inherent. However, some of the experts believe that creativity the same as the other abilities exist in different degrees in all people and its emergence is as a result of interaction between the inherent ability and cultural, social, and environmental factors. Therefore, creativity can be taught (Jane, 2001; Barron, 2003). Torrance, for example, points out 142 researchers based on which he claims creativity is teachable.

The goal of teaching creativity is mental flexibility, enablement of personality (nurturing the spirit of independence and self-confidence) is the creation of appropriate individual and family atmosphere meaning that there should be an attempt to enable the general abilities of creativity at the individual level to cope with hardship excellently and face the problems with hard work. Torrance (1990), while criticizing the traditional education, emphasizes on the importance of change and the development of traditional programs and leading education towards the creative programs and believes that teaching the creative methods is the determining factor in the increase of the students' creativity. Renzulli (2002) during a research analyzed the effects of programs for teaching creativity on the ability of the creative thinking and the students' independent thinking.

The findings indicate that the program of teaching creativity, clearly, has a positive effect on the students' thinking. The same as this research, Magison (2004) showed that teaching creativity has positive effects on the students' creative abilities and innovations. Niu (2007) studied the individual and environmental effects on 357 high school students whose creativity had been attained by the completion of stories and the evaluation of divergent thinking. The results of this research indicated that both of the environmental and individual effects and the mechanism related to it play undeniable roles in the formation of creativity. Matud, Rodrigues and Gerandy (2007) by using Torrance's verbal and pictorial test on creative thinking indicated that sex does not play a role in regards to creativity and if there is any difference between men and women in this regard, it is minimal and insignificant.

Mike, Sonmi, and Muammar (2009) analyzed the effect of the discovery education program on elementary students in a research and the results indicated that active learning, significantly, increases the students' creativity. Flavian (2006) showed that the method of brainstorming and forced association is two of the effective methods in the increase of creativity. The research conducted by Asgari (2007) on the female fourth graders indicated

that the brain storming method has been effective on them. Pierre Khaefi et al. (2009), indicated that teaching creativity causes the increase in the creative meta-cognition components in the trained students.

The research conducted by Khosravani and Gilani (2006) indicated that in addition to the effectiveness of creativity on the cognition components, creativity is connected with the psychological health as such that people at the higher level of creativity, experienced less anxiety and depression and valued themselves more.

Since man's civilization is as a result of his creativities and innovations, teaching creativity is highly important. Taking into account the importance of this phenomenon in man's growth and proliferation, its teaching is also important. In the analysis of the literature in connection with the research, the three methods of brainstorming, forced association and synectics are of a higher reputation. Brain storming is a technique for the appearance of the ideas in the mind of a group including an absolute freedom process for expressing ideas and a next process for discussion, classification and the elimination of choices and making a decision to perform an experimental choice. In the forced association method between the two groups of the phenomena (contrary to the free association method), compulsory connection will be created. In the other words, an individual or some individuals will be asked to make a connection between a phenomenon and another one that are not normally related to each other by resorting to mental efforts. This method is useful for children because for them, this is some kind of a game. The synectics pattern is an educational approach which emphasizes on the creative problem solving method and methods that increases creativity. In this method, thinking is done by metaphorical and exemplary activities.

### **3. Research Questions**

The main question of this research is which of the mentioned methods is more effective in the emergence of creativity. Additionally, what kind of role gender plays in the cultivation of creativity?

### **4. Purpose of the Study**

This research was conducted with the objective of examining the effect of three methods of creativity development (brain storming, forced association and synectics) on creativity development in elementary students in Tehran city.

## **5. Research Methods**

### *5.1. The pool, the sample and the method of sampling*

The statistical pool of the research is the elementary male and female students in the academic year of 89-90 with a mean of 11/10 in age. To select the samples, first a notice regarding having a course in creativity in Tehran's elementary schools was circulated. Then, the ones interested were registered. In total, 212 signed up for the class. Then, a total of 160 students (80 boys and 80 girls) were selected from the registration roster.

The criteria for the selection was to make sure that the students, as closely as possible, having variables such as the same level of intelligence, similar social and economical classification and the assurance that none of them had taken such a course before. Then, the written permission was taken from the parents for the participation in the creativity courses. After the sampling, all the students were given creativity pre-test and the examinees were randomly placed in controlled and testing groups.

For the testing or trial group, the teaching took 8 weeks and in each week, there were two 45- 60 minute sessions. However, the controlled group in both the male and female groups received no teaching. In this research, taking into account the three different methods used for teaching creativity, in each group one of the methods was performed. At the end of the teaching, all the controlled and testing groups were given the creativity post-test.

### *5.2. Tool*

In this research, in order to measure the creativity of controlled and testing groups in the pre- test and post-test, Torrance's Pictorial Creativity Test (form B) has been utilized. This test has been three exercises or activities which are used for pre-school through high school students. The first exercise is related to the drawing of a picture using a piece of colour paper and black or colour pencils and put a name on the final product. The second exercise is related to the completion of the pictures. In this exercise, the examinee is asked to complete the presented incomplete pictures and put names on them and make the pictures using the circles given to them and the third exercise is about circles. In this exercise, the examinee is asked to put names on the final product.

The evaluation of the product's validity and the content of the test which has been done using the factorial analysis method have given acceptable theoretical and experimental evidence supporting the validity of the test (Emamipour, 2002 as cited in Asgari, 2007).

The studies about the credibility of Torrance's creativity test show a rating of more than 90% (Torrance, 1990). In this research, in order to calculate the result of the test, the re-testing

method with a time interval of 1 month in a sample of 73 students was carried out and the final result had a credibility of more than 81%. These findings indicate that the test is both valuable and credible.

## **6. Findings**

The results of variance analysis show the difference between pre-test and post-test scores to be significant in all groups except in the controlled ones. In other words, using the brain storming, forced association and synectics are effective in the increase of the students' creativity.

The results of the co-variance analysis show the effect of group membership on the creativity post-test scores to be significance. In this analysis, the pre-test variables and gender have been considered as moderator variables meaning that their effect has been extracted from the post-test scores. Then, taking into account the scores left at the end, the groups were compared. The results showed that between the means of the creativity scores in four groups, there is a difference in the post- test. However, it is not clear which group is different from the rest of them. Therefore, the comparisons of a couple of tests using the Tukey Follow-Up Test were done and according to the results, the difference between the methods of nurturing creativity is not significant, but it was significant between the controlled and testing groups.

The results of the analysis of variance for comparing the two groups of boys and girls showed that except for the controlled group, there is a significant change in the creativity post-test.

This analysis showed that the post-test mean of scores for girls in the brain storming group was more than the boys in this group. However, in the forced association group, creativity post-test mean for boys was higher. In the synectics group was not significant difference in post- test mean the girls and boys.

## **7. Conclusions**

This research showed that there was a difference between the students who participated in the creativity classes and those who did not. It means that other than method, teaching creativity to the students has been effective in increasing their creativity. This conclusion goes along with the conclusions of Davari and Sharifi (2009), Renzuli (2002), Torrance (1990), Flavian (2006),

Mirzaeeyan (2004), Asgari (2007), Hassani (2001), Gagliardi (2006) and Fryer (1996). For the clarification of these findings, we can say that creativity, the same as other abilities, exists in all people in different degrees and it is clear that its emergence depends on a lot of

environmental factors and giving the necessary teachings in this field and the students' enjoyment of creativity teachings are of the most important ones.

Without considering the gender variable, the difference between the methods of teaching creativity is insignificant. In other words, none of the methods have priority over another one. This conclusion goes along with the researches conducted by Davari and Sharifi (2007) Using the brain storming in girls compared to the other two methods is more effective in their creativity, while the forced association method in boys had led to better results. However, as far as synectics is concerned, no much of a significance was found between male and female students, as far as the different creativity nurturing is concerned is compatible with the findings of Yernis and Weaver (1990).

In total, the degree of creativity among boys in both pre- and post-tests is a little more than girls. This result could be related to the cultural factors, because boys have been given more freedom than the girls. Therefore, it seems that this factor itself has elevated the emergence of creativity among boys.

At the end we can say that;

- Participation of students in classes teaching creativity has been effective in increasing their creativity.
- It is recommended for the girls to have trainings in creativity using the brain storming and boys to have them using forced association.
- For the emergence of creativity, high intelligence is not necessarily needed. Having average intelligence is enough for nurturing creativity. Contrary to what unskilled think; children and students having an average IQ can also enjoy creativity learning classes.

In fact this means that we can utilize environmental stimulations and rich trainings to increase the students' creativity.

One of the limitations of this research is the fact the results of this research are related to the elementary students in the city of Tehran. Therefore, its generalization to other places and levels should be done carefully.

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