

COMPARISON OF THE IMPACTS OF SYNECTICS TEACHING MODELS AND BRAINSTORMING ON THE CREATIVITY OF THE STUDENTS

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Abstract. The aim of this study was to compare the impact of innovative teaching models and brainstorming on the creativity of elementary school students in Ardabil city. The research methodology is "quasi-experimental" and the goal of it is "applicability". Data collection method for this study was based on field and classroom selections. Data collecting tool in this study was Torrance creativity questionnaire that its reliability is calculated by using Cronbach's alpha equal to 0.81. The analysis of the collected data, SPSS software was used and tests which are used in this study were the co-variation analysis and T-test in two independent groups. The results showed that innovative method have a greater impact on students' creativity than brainstorming method.

Keywords: *teaching models, brainstorming, students' creativity, SPSS*

1. Introduction

By Giving the central role of the state educational system in training the younger generation it's responsibility is doubled in this realm and in comparison to other institutions and the only ability which could equip students in future with the growth of human capabilities, is creating related skills and strengthen abilities of the creative spirit in them. The main objective and basic concern of the educational system, is foster creativity and creative education in students then first important step in doing so, is identifying the foundations of creativity and its applications (Hosseini, 2003).

Robbins has expressed creativity the ability to combine ideas in a unique way or creating a connection between the ideas (Darzi Ramandi et al. 2015).

One of the active and innovation-driven methods is Synectics teaching Method. Like other forms of innovative methods, it helps to flourish students creativity by educational guidance, so that, as in this method life skills is taught by using the simile, metaphor and analogy, therefore, students have more freedom in response to questions of this lesson and this will lead to the development of skills of students based on creativity and innovation (Aqazadeh, 2009).

In the teaching of brainstorming, the teacher gives examples to students and asks them to express every solution to the problem which comes to their mind. The main solution cannot be expressed before providing different solutions by all the learners (Mellow, 1996 was quoted the Madandar Arani and Kakya, 2009).

Teaching creativity by Synectics and brainstorming method are among the ways that can increase people's creativity. The method of brainstorming also as a way to foster creativity has created a certain effective steps. Teaching creative thinking through brainstorming and Synectics method can be effective in increasing the creativity and problem-solving ability.

The main objective approach to creative thinking in students is that teachers can understand students' mental structures and to change their current plan. These changes include: identifying and removing barriers to learning (misunderstanding and shortcomings), create arguable ideas based on factual evidences and spread more accurate ideas, upgrading skills and improving the point of views of teachers and professors in the field of

active teaching methods, to teaching-learning process and increase vitality and joyous educational atmosphere, promoting self-direction in learning, understanding goals and self-assessment ability between teachers and students, group cooperative learning in teacher and student and increase the power of scientific attitude and achieve higher levels of cognitive domain and strengthen the ability of interpretation and judgment in the students are other purposes of this training method. If a learner becomes familiar with his knowledge, resources and research methods during his studies, he will create new materials and write, criticise and review ideas on the training, therefore at the end of the course can be an efficient and effective person in any environment, and can produce new ideas and knowledge. Amiri and Noruzi (2013) in a study have indicated that the method of brainstorming in creative thinking skills course, has a significant impact on increasing the creativity of students. Momeni et al. (2011) also presented that the use of Synectics teaching model causes in the growth and development of students' creativity. Also, applying this model brings about improvements in fluency, flexibility, originality and elaboration of students' thinking.

The results of Darzi Ramandi et al. (2015) also indicated that Synectics approach on the academic achievement of students in social studies lesson has a positive effect on increasing the amount of components of creativity (fluency, originality, flexibility and elaboration). The Results of the Madandar Aran and Kakya (2009) indicated that teaching creativity by method of brainstorming is confirmed on the issue of developing elaboration but on the other components, there isn't any significant difference between the two methods of brainstorming and guided discovery. However, with regard to previous researches, this study attempts to measure the creativity of elementary students in Ardabil city based on two models of brainstorming and Synectics.

Therefore the following assumptions were investigated in this study:

The impact of Synectics teaching method in comparison to brainstorming method is different on the fluidity of creativity of the students.

The impact of Synectics teaching method in comparison to brainstorming method is different on flexibility of the creativity of the students.

The impact of Synectics teaching method in comparison to brainstorming method is different on the initiative thinking of the students' creativity.

The impact of Synectics teaching methods in comparison to brainstorming method is different on the development of students' creativity details.

2. Methodology

The target population of this study is included all elementary school students in Ardabil city that are equal to 3,100 members. In this study, 40 students were randomly selected from one of the elementary schools in Ardabil city and homogenization was carried out according to their average score of their last semester and they were divided into two 20 students classes and to collect data we used the standard 60-item Torrance verbal creativity questionnaire that measures four-components of fluency, initiative, flexibility and elaboration. In order to ensure the reliability of the questionnaire, 20 questions before final implementation, was conducted randomly among participants and after the collection, the amount was calculated by Cronbach's alpha equal to 0/81.

After the equivalent of two classes of students in accordance with the assumptions of statistical control, through academic achievement, scholars to study the impact of independent variables on the dependent variable have thought learning methods to both teachers of two classes and during two pre-consultation meeting the scholar offered the training program to them in order to make them run it for 2 months in class.

In the first session Torrance creativity questionnaire as pre-test was conducted in both classes during the implementation of Synectics teaching and brainstorming method as independent variables, the scholar communicated with the teacher and was present in both classes so conduct them in difficulties then at the

end of two months, the same papers as the post-test questionnaires were conducted in both classes. One of the preconditions for the use of co-variation test is examination of normal statistical distribution of variables. For this purpose, by using the Kolmogorov-Smirnov test, the normality of the variables has been examined and confirmed .

3. Findings

Hypothesis 1: The impact of Synectics teaching methods in comparison to brainstorming methods is different on the fluency of creativity of the students.

Table 1: One-way-variance analysis

The intensity	The significance level of p-value	amount of F
0.61	0.000	51.253

Table 2: The mean of pre-test and post-test examinations

p-value	α	the amount of t	Standard deviation	Mean of replies	Number	group	level
0.711	0.05	1.45	6.01	28.14	20	Control	Pre-test
			6.94	29.96		the experiment	
0.000	0.05	8.05	7.01	31.45	20	Control (brainstorming)	Post test
			8.26	12.39		Experiment (Synectics)	

According to the p-value it is concluded that the fluency between the students in both Synectics teaching and brainstorming, has a significant difference that according to the amount of mean of fluency score in post-test subjects we can see that in the Synectics method, Fluency score of students are more than

brainstorming that this effect is also higher due to the value of 0/61.

Hypothesis 2: The impact of Synectics teaching methods in comparison to brain storming methods is different on flexibility of creativity of the students.

Table 3: One-way-variation analysis

the intensity	The significance level of p-value	Amount of F
0.598	0.000	22.31

Table 4: pre-test and post-test of flexibility

p-value	α	the amount of t	Standard deviation	Mean of replies	Number	group	level
0.355	0.05	1.44	6.56	23	20	Control	Pre-test
			5.33	21		the experiment	
0.000	0.05	19.67	5.82	27	20	Control (brainstorming)	Post test
			7.19	34		Experiment (Synectics)	

According to the p-value it is concluded that amount of flexibility between the students in both methods of Synectics and brainstorming, there is a significant difference which according to mean score of amount of flexibility of subjects at post-test, we realize that in the Synectics teaching method, students flexibility

score is more than brainstorming that this effect is also higher due to the large amount of value 0/598.

Hypothesis 3: the impact of Synectics teaching methods in comparison to brainstorming method is different on the initiative thinking of the students' creativity.

Table 5: One-way-variance analysis

intensity	The significance level of p-value	Amount of F
0.621	0.000	21.44

Table 6: Statistical Indicators of innovation

p-value	α	The amount of t	Standard deviation	Mean of replies	number	group	level
0.558	0.05	1.39	6.55	32	20	control	Pre test
			5.28	33		experiment	
0.000	0.05	16.42	6.59	36	20	Control (brainstorming)	Post test
			6.19	41		Experiment (Synectics)	

According to the p-value it is concluded that on the initiative level of students between the two methods of Synectics teaching and Brainstorming there is a significant difference which by considering the subjects' post-test mean score of initiative participants we realize that in Synectics approach, the initiative

thinking of students score is higher than brainstorming that this effect is also more due to the large amount of 0/621.

Hypothesis 4: The impact of Synectics teaching methods in comparison to brainstorming method is different on the detail elaboration of students' creativity details.

Table 7: One-way-variance analysis

intensity	Significance level of p-value	Amount of F
0.711	0.000	26.78

Table 8: statistical indicator of detail elaboration

p-value	α	Amount of t	Standard deviation	Mean of replies	number	group	level
0.712	0.05	0.69	6.45	24	20	control	Pre test
			5.79	25		experiment	
0.000	0.05	18.28	6.77	30	20	Control (brainstorming)	Post test
			6.46	34		Experiment (Synectics)	

According to a p-value it is concluded that between the detail elaboration score of students in two methods of Synectics and brainstorming, there is a significant difference which according to the mean score of detail elaboration of participants at post-test we can notice that score of detail elaboration in the Synectics method is more than brainstorming and this effect is higher also due to the large amount of 0/711.

4. Discussion and conclusion

- Results of first hypothesis indicated that in Synectics teaching method, students' fluency score increases more than brainstorming method. Fluency or fluidity, expresses the mental ability of relationships between idea and thought which is measured based on the number of ideas or solutions and the ability to provide multiple answers to a given location at a given time, students in Synectics method without any fear of providing wrong answers, participate in learning process and practice giving multiply answers, so that's why students in the experimental group in terms of fluency have a better position compared to the control group. These results are consistent with researches of Amiri and Noruzi (2013), Momeni et al. (2011), Darzi Ramandi et al. (2015).

- The second hypothesis results indicated that in the Synectics teaching method, students' flexibility score increases higher than brainstorming method. The flexibility is the ability to think in different ways to solve a new problem, students in the traditional way were busy on memorization and learning stereotypes and didn't have flexibility and providing answers in other ways, but in Synectics teaching they, freely and without fear, practice different ways of thinking and responding to new issues, therefore, this method increases the flexibility for students. The results of the research are consistent with results of Amiri and Noruzi (2013), Momeni et al. (2011), Darzi Ramandi et al. (2015).

- The third hypothesis results indicated that in the Synectics teaching method, the score of initiative thinking of students' increases higher than brainstorming method. Initiative thinking is the ability to think in an unusual way and contrary to common habits that comes with the unusual, strange and subtle answers. Thus, in the teacher-centered teaching and learning methods in traditional ways, students are empty containers whom the teacher has a duty to give content and on-side-transfer them and students do not have the guts to talk, but to call the stereotype answers that the teacher previously has taught to them, so we do not expect the initiative thinking. But in Synectics teaching method, students learn how to think for metaphorical and analogous types of work. They use analogies to solve new problems and new ideas and express their opinions freely and find new ideas.

Therefore Synectics teaching method enhances the students' initiative thinking ability. These results are consistent with findings of Amiri and Noruzi (2013), Momeni et al. (2011), Darzi Ramandi et al. (2015).

- The fourth hypothesis results indicated that in Synectics teaching methods, students' score increases higher than brainstorming on detailed elaboration of students. The ability to complete a thought and add details to it is called detail elaboration. Unlike ordinary people who are always looking for solutions and carefree ways and use easy to traverse ways, creative people, selects complexity, and is looking for an easy solution for them. In traditional teacher-centered approaches, the teacher provides full content and also evaluates them. As a result, students are not given any opportunity to think, vice versa in Synectics teaching ways not only contents are not provided completely, but students are actively participate in learning by using metaphor and analogy, discovery and description of concepts, and are accurate on their ideas and thoughts and complete them by linking them with other ideas, so that introduce their new ideas. Thus students expand their practice. In this way students perform better in developing content. These results are consistent with findings of Amiri and Noruzi (2013), Momeni et al. (2011), Darzi Ramandi et al. (2015).

5. Suggestions

1. According to the obtained results and the positive impact of Synectics teaching method it is proposed to increase training students in this method rather than listening to the teacher and learning the lesson by teacher and finally memorizing the content and responding parroting. Through descriptions, similes and analogies, they can have an active learning process and production of creative ideas; foster their creativity, by using what they have learned in the early stages of innovative methods, therefore helps in their academic achievement.

2. The use of different methods and techniques fosters creativity (brainstorming, research skills, etc.) in the teaching process, that fruitful results will be achieved in various aspects such as the development of creativity, improving the teaching-learning process, communication and interaction in the process of revision training.

3. The existence, nature and impact of this informal and non-codified aspect "hidden curriculum" of school should be completed and understood by administrators, teachers, parents, students and community members. Any official attempt at designing curriculum development should turn its attention to all aspects of the hidden curriculum. Such an effort, particularly in defining the overall goals and behavioral objectives of the emotional realm and the realm of interpersonal contraction,

learning opportunities that have major importance in facilitating socialization process, particularly in relation to moral development and character has to be taken into consideration.

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