THINK INDIA JOURNAL

ISSN:0971-1260

Vol-22-Issue-28-December-2019

Impact of Creativity Strategies on the Academic Achievement among VIII Standard Science Students

Mrs. Megha Deepak Gokhe[1] and Dr. Karuna H. Sinha[2]

[1]Thakur Shyamnarayan College of Education & Research

[2]H. J. College of Edcuation, Khar

ABSTRACT

Education is the provision of a series of learning experiences to students in order to impart knowledge, values, attitudes and skills with the ultimate aim of making them productive members of society. Creativity is an important component of Revised Taxonomy -21st Century skill. Teaching learning process has occupied an important place in the field of education. Teaching and learning are two fundamental aspects of educational process.

This is a Research paper which focuses on the importance of creative strategies in teaching learning process. Effectiveness of educational system largely depends upon the active, resourceful and competent as well as creative teachers. Academic performance of students depends on the use of creative strategies in the classroom wherein interest of students is intact and they are attentive in achieving good grades and enhancing their imagination and thinking power. Objective of the study is to study the effectiveness of Training Programme on development of creativity among Std VIII boys and girls in Science subject. Hypothesis of the study is there is no significant difference between creativity scores of boys and girls among Std VIII science students. Findings of the study are there is no significant difference between creativity scores of boys and girls among Std VIII science students.From the above findings it has been concluded that there is no significant difference between boys and girls among Std VIII Science students. Creativity Strategies used to teach Science will enhance the thinking process among boys and girls and finally helps in achieving good scores in Science subject.

INTRODUCTION

According to Beghetto & Kaufman, (2007) development of creativity appears to be the alternative in this sordid state of human affairs. Further, new ideas, process and inventions have become absolutely necessary for the continued development of science and technology. For this, creativity forms the basis; the outcome of creative thinking is "novelty" and "innovativeness". Creativity is an important component of Revised Taxonomy -21st Century skill. Teaching learning process has occupied an important place in the field of education (Sawhney, 2011).

According to Yu-sien Lin, (2012) teaching and learning are two fundamental aspects of educational process. As per Tomasevic & Trivic, (2014) science learning is strongly dependent on science teaching. Although early exposures to natural phenomena supposedly trigger a child's interest in concepts related to science, a certain level of cognitive development is required for the child to notice natural phenomena, and this level of development is especially necessary for the child to be able to pose questions related to the underlying mechanisms of the phenomena.

According to Ustaa and Akkanatb (2014) every child is born with creative potential, but this potential may be stifled if care is not taken to nurture and stimulate creativity. Young children are naturally curious. Even before they enter primary school, they already have a variety of learning skills acquired through questioning, inquiring, searching, manipulating, experimenting, and playing. Children need opportunities for a closer look; they need time for the creative encounter. Creative Pedagogy in the National Advisory Committee on Creative and Cultural Education report (1999), teaching creatively and teaching for creativity are described as two different approaches of enhancing creativity. Children are highly creative and in adults, creativity has

ISSN:0971-1260

Vol-22-Issue-28-December-2019

too often been suppressed through education, but it is still there and can be reawakened. Often all that is needed to be creative is to make a commitment to creativity and to take the time for it.

CREATIVITY

According to Trnova, (2014) creativity means bringing into being; it involves the generation of new things or ideas or the transformation of those previously existing. A simple definition is that creativity is the ability to imagine or invent something new. Creativity is not the ability to create out of nothing but the ability to generate new ideas by combining, changing, or reapplying existing ideas. Some creative ideas are astonishing and brilliant, while others are just simple, good, practical ideas that no one seems to have thought of yet. Everyone has substantial creative ability.

According to Diehl and Tassoul (2005) few characteristics of the Creative Person are that he is curious, seeks problems, enjoys challenge, works hard etc. optimistic, able to suspend judgment, comfortable with imagination, sees problems as opportunities, sees problems as interesting, problems are emotionally acceptable, challenges assumptions and do not give up easily etc. When a student is asked to "invent" a solution to a problem, the student must draw upon previous knowledge, skills, creativity, and experience. The student also recognizes areas where new learning must be acquired in order to understand or address the problem. This information must then be applied, analysed, synthesized, and evaluated (Ustaa and Akkanatb, 2014).

THE STEP-BY-STEP PROCESS FOR A CREATIVITY SESSION

Similar to the steps of product development process, each step of the creativity process has two main phases :a divergent phase and a convergent phase ‘problem’ definition, followed by a divergent phase which includes the ’creation’ or ‘widening’ of a field of possibilities which includes collecting and generating facts, problem statements, and ideas, without criticism. Then resultant solutions are clustered and categorized, followed by a convergent phase in which there is a narrowing of choices based on criteria of what is useful and relevant.

The four stages of the creativity process each demand a different attitude from the participants.

THE STEPS ARE ELABORATED HEREWITH

i) Problem Definition

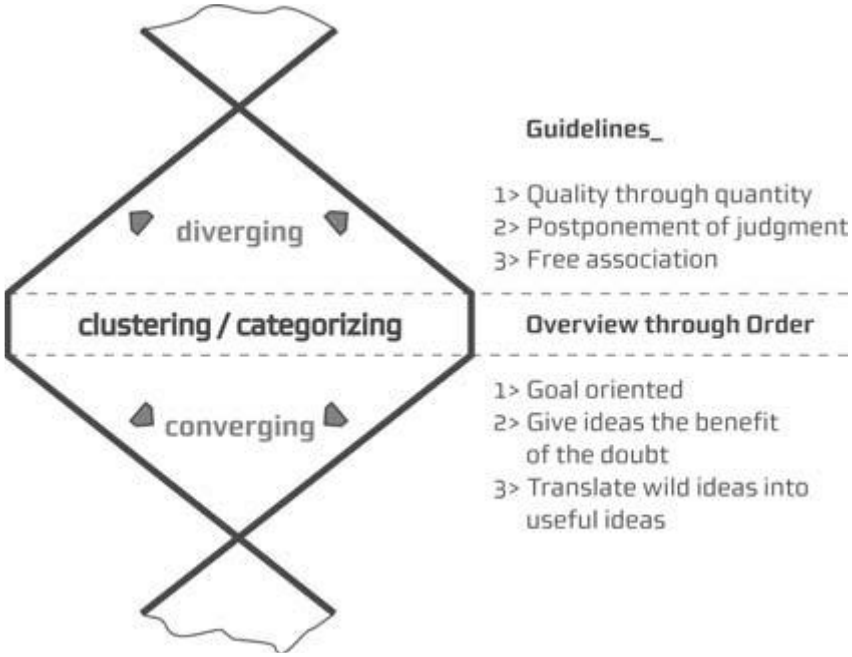
The formulation of the problem definition for the creativity session has a big impact on the outcomes of the creativity session. If the problem is not defined accurately, the created results might be irrelevant for the project. Guidelines for defining a problem include: Formulate the goal of the creativity session in one sentence. Formulate from the project focus (the problem) in a concise and clear way. It forces the team to tackle the core of the problem. Often a problem consists of several sub-problems. It is recommended to tackle the sub problems first, and then to bring the sub-solutions together. Keep a real and tangible focus. If the problem defined is too abstract, the results will be general and will lead to sub-optimal solutions (Diehl and Tassoul, 2005).

ii) Divergent Phase

During the divergent phase of the creativity process, a large number of alternatives are identified. At this stage the most important rule is: ‘quality is quantity’ to generate as many solutions and new ideas as possible. Free association plays an important role during this stage. In addition, the rule of not judging ideas is essential. When confronted with new ideas or concepts it is important that participants take a constructive stance.

ISSN:0971-1260

Vol-22-Issue-28-December-2019



Creativity Tech The creativity process

iii) Clustering Phase

Done properly, many ideas and solutions will have been generated and collected during the divergent phase. The sheer number of new options will make it hard to come to select the best ones. For that purpose, an additional stage of 'cleaning up' and acquiring an overview of the options generated (over 200 ideas is not unusual!) is useful before moving on to evaluation and selection. It his phase ideas are grouped together based on commonalities. At this stage some ideas may be clarified and/or elaborated upon for clarification.

v) Converging Phase

In the converging phase, all the ideas have the benefit of the doubt (the value of the idea may not be apparent at first), but one should also make decisions and work towards the stated objective. The alternatives chosen are then evaluated and selected.

Creativity Techniques

There are differences between textual and visual creativity techniques. General speaking, it is time (visual creativity techniques require more time than textual)and quantity (textual) versus detail (visual). Both kinds of techniques have advantages and disadvantages. Drawing may cover more of the original ideas because one does not have to reduce the idea into words, but one has to be able to draw what one thinks. Textual is faster, but there can be problem with foreign languages and limitations because of the meaning of the words used. As a bottom line, creative techniques should be provocative and force thoughts out of the normal routine and into the open.

Examples of Creativity Techniques

- Classical Brainstorming
- Brain Writing
- Mind Mapping
- Five W s and H
- Scamper and
- Analogies

ISSN:0971-1260

Vol-22-Issue-28-December-2019

Models of Creativity

The Components of Creativity Given by John Munro: Creativity is an extremely complex process to understand. It is frequently assumed that human processes as complex and as 'personal' as creativity cannot be studied scientifically or captured in a theory. The componential theories of creativity identify the aspects or components of individual activity that need to be in place for creative outcomes. Componential theories of creativity have been proposed by Amabile (1996) and Urban (2002, 1991). These models identify several components they see as necessary for generating creative outcomes.

Amabile's (1996) theory identifies three components or aspects necessary for creativity. The components are grouped into two main areas of human activity: Cognitive or knowledge and thinking components, Personality or motivational and emotional components, Having a high-level knowledge and skills of a specific topic area, Being able to think divergently about the topic, Having a well-developed general knowledge and thinking base, Having high level focusing and task commitment, Having high intrinsic motivation and motives and Being 'open' about the topic and prepared to tolerate ambiguity in the area. According to Lewis et al., (2011) the following dimensions have been identified by Amabile (1996): Specific knowledge base- expert knowledge, Divergent thinking, General knowledge and thinking, Focusing and task commitment, Motives and motivation, and Openness and tolerance

Values of the model

The componential models of creativity can be used to facilitate teaching in a number of ways:

- To unpack the concept of creativity and to examine what it might actually 'look like' in their teaching.
- To assist teachers and schools to evaluate their teaching to examine the extent to which each component is being developed
- To implement teaching that could target each aspect.

OBJECTIVES OF THE STUDY

To study the effectiveness of Training Programme on development of creativity among boys and girls in Science subject.

HYPOTHESIS OF THE STUDY

Null hypothesis: There is no significant difference between creativity scores of boys and girls among Std VIII science students.

METHODOLOGY OF THE STUDY

The present study is a True Experimental Design.

The Sampling technique used for present study is simple random sampling technique.

TOOL OF RESEARCH

Achievement test based on the content of VIII Standard Science subject of SSC Board.

ANALYSIS AND INTERPRETATION OF DATA

Null hypothesis: There is no significant difference between creativity scores of boys and girls among Std VIII science students.

For testing null hypothesis we use data regarding pre and post creativity scores of boys and girls amongst Std VIII science students collected by researcher. The details of which are given below.

ISSN:0971-1260

Vol-22-Issue-28-December-2019

Table No: Details of Scores, variables and Normality test

Variable – family structure	Gender	Null for Normality test	Normality test	P value	Result of normality test
Pre-creativity scores	Boys	The distribution of **Pre-creativity scores of boys** is normal with mean 47.153 and S.D. 19.22	One sample kolmogorov-smimov test	0.419	Retain null hypothesis
	Girls	The distribution of **Pre-creativity scores of girls** is normal with mean 48.438 and S.D. 9.77	One sample kolmogorov-smimov test	0.803	Retain null hypothesis
Post-creativity scores	Boys	The distribution of **Post-creativity scores of boys** is normal with mean 104.806 and S.D. 41.27	One sample kolmogorov-smimov test	0.420	Retain null hypothesis
	Girls	The distribution of **Post-creativity scores of girls** is normal with mean 116.125 and S.D. 29.50	One sample kolmogorov-smimov test	0.341	Retain null hypothesis

From the above table it is observed that

p values for variables **Pre-creativity scores of boys, Pre-creativity scores of girls, Post-creativity scores of boys and Post-creativity scores of girls are** 0.419, 0.803, 0.420 and 0.341 respectively. These values are greater than Critical p value 0.05. Hence we retain null hypothesis and data is normally distributed.

Hence we use two independent sample parametric 't' test for testing significance difference between pre and post creativity scores of boys and girls.

Results of two independent sample parametric 't' test for testing significance difference between pre and post creativity scores of boys and girls:

Descriptive statistics for pre and post creativity scores of boys and girls

	GENDER	N	Mean	Std. Deviation	Std. Error Mean
Pre-creativity scores	Boys	98	47.153	19.2243	1.9419
	Girls	16	49.438	9.7705	2.4426
Post-creativity scores	Boys	98	104.806	41.2722	4.1691
	Girls	16	116.125	29.5023	7.3756

It is clear that that there is difference in mean values of Pre-creativity scores of boys and girls. It is also seen that there is difference in mean values of Post-creativity scores of boys and girls. In fact mean scores for girls is more than that of boys in both cases.

ISSN:0971-1260

Vol-22-Issue-28-December-2019

Hypothesis test summery of two independent sample parametric 't' test:

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	P value	t	Df	P value
Pre-creativity scores	Equal variances assumed	9.903	.002	-.464	112	.643
	Equal variances not assumed			-.732	37.630	.469
Post-creativity scores	Equal variances assumed	3.172	.078	-1.052	112	.295
	Equal variances not assumed			-1.336	25.711	.193

From table it is seen that

1. p value of Levene's Test for Equality of Variances for data related to Pre-creativity scores is 0.002. This value is less than $\alpha = 0.05$ (5% significant level) indicates that both the groups (boys and girls) are non-homogeneous (unequal variance). Hence we consider second row for t-test for Equality of Means. Further P value for t-test for Equality of Means is 0.469. This is greater than $\alpha = 0.05$ (5% significant level). Hence we retain null hypothesis in this case. Hence we may reveal that there is no significant difference between Pre-creativity scores of boys and girls.
2. p value of Levene's Test for Equality of Variances for data related to Post-creativity scores is 0.078. This value is greater than $\alpha = 0.05$ (5% significant level) indicates that both the groups (boys and girls) are homogeneous (unequal variance). Hence we consider first row for t-test for Equality of Means. Further P value for t-test for Equality of Means is 0.295. This is greater than $\alpha = 0.05$ (5% significant level). Hence we retain null hypothesis in this case. Hence we may reveal that there is no significant difference between Post-creativity scores of boys and girls.

FINDINGS

From the above analysis we may reveal that there is no significant difference between creativity scores of boys and girls among Std VIII science students.

CONCLUSION

From the above findings it has been concluded that there is no significant difference between boys and girls among std VIII Science students. Creativity Strategies used to teach Science enhances the thinking process among boys and girls and finally helps in achieving good scores in Science subject.Academic achievement is an outcome of learning, which is typically measured by classroom grade, classroom assessments, and external achievement tests. A study investigated relationship between students' creativity and academic achievement and the results stated that both the variables positively correlated and that higher levels of creativity for students increase their academic achievement. Hence it can be concluded that boys and girls of std VIII are equally creative.

REFERENCES

- Ai, X. (1999). Creativity and Academic Achievement: An Investigation of Gender Differences. Creativity Research Journal, 12(4), 329-337.
- **Amabilm T. M.** (1983). Social psychology of creativity: A componential conceptualization. Journal of Personality and Social Psychology. 45, 997-1013.

ISSN:0971-1260

Vol-22-Issue-28-December-2019

- Beghetto, R.A. & Kaufman, J.C., 2007. Toward a Broader Conception of Creativity: A Case for "mini-c" Creativity. *Psychology of Aesthetics, Creativity, and the Arts*, 1(2), pp.73–79.
- Diehl J. C. and Tassoul M., (2005) Creativity Techniques retrieved from http://creatingminds.org/tools/tools_all.htm accessed on 10th October, 2019
- Grace C. W. Ndeke1 , Mark I. O. Okere1 & Fred N. Keraro (2016) Secondary School Biology Teachers' Perceptions of Scientific Creativity. Journal of Education and Learning; Vol. 5, No. 1;, Curriculum, Instructional and Educational Management Department, Egerton University, Egerton, Kenya
- Lewis S. E., Shaw J. L. and Freeman K. A., (2011), Establishing open-ended assessments: investigating the validity of creative exercises, *Chem. Educ. Res. Pract.*, 12, 158–166.
- Overton T. and Potter N., (2008), Solving open-ended problems, and the influence of cognitive factors on student success, *Chem. Educ. Res. Pract.*, **9**, 65–69.
- Sawhney, Neena. (2011). Promoting Creativity and Innovation in Education System. Retrieved from: https://www.researchgate.net/publication/230659526 accessed on 05th November, 2019 Research Gate, India
- Sharma, Neeru. (2015). Scientific creativity in relation to cognitive style and achievement in science of secondary school students. *Educational Quest: An International Journal of Education and Applied Social Sciences, 6*(1), 25-29.
- Tomasevic, B. & Trivic, D., 2014. Creativity in teaching chemistry: how much support does the curriculum provide? *Chemistry Education Research and Practice*, 15(2), pp.239–252.
- Trnova Eva, (2014) IBSE and Creativity Development, Masaryk University, Science Education International Vol. 25, Issue 1, 2014, 8-18
- Ustaa E, Akkanatb C (2014) studied, Investigating Scientific Creativity Level of Seventh Grade Students, Faculty Member, Department of Primary Education, Gaziosmanpaşa University, Taşlıçiftlik, Tokat/Turkey, Procedia - Social and Behavioral Sciences 191 (2015) 1408 – 1415
- Yu-sien Lin, (2012) Adopting Creative Pedagogy into Asian Classrooms? –Case Studies of Primary School Teachers' Responses and Dilemma Research Center for Curriculum and Instruction, *National Academy for Educational research*, New Taiepi City, Taiwan.