



## ON THE EFFICACY OF ART AND SCIENCE CLUBS IN DEVELOPING CREATIVITY AMONG CLUB MEMBERS

Mousumi Sarkar<sup>1</sup> and Dr.Paramananda Sarkar<sup>2</sup>

<sup>1</sup>Research Scholar, Department of Education, University of Kalyani.

<sup>2</sup>Ex-Principal, Gangadharpur Mahavidyamandir.

### ABSTRACT

The main objective of this paper was to study the efficacy of Art and Science Clubs in developing creativity (fluency, flexibility and originality) among its members.

Three groups of children (age group 13+ to 16+) with exposure to 1) Science club (N = 19), ii) Art Club (N = 18) and iii) with no exposure to such Clubs were compared for three mean creativity scores and on the basis of results obtained the following conclusions were made :

1. Children with exposure to Art and Science Clubs scored higher in creativity than those with no such exposures.
2. Creativity increased as the duration of exposure to the clubs increased.



**KEY WORD:** Creativity, Science Club, Art Club.

### INTRODUCTION :

Man is not content with the world that he has been given. From his primitive days, says the Indian poet, Rabindranath Tagore "he has been busy creating a world of his own resources from the raw materials that lie around him". This is the unique inborn urge to create which makes man different from other animals. This precious qualities of man, his uniqueness, is also man's most important contribution to society (Buber, 1946). The Indian system espouses the concept of creativeness is based on the needs of man and realities of our nature. So, in a changing world, the cultivation of creative personality sensitive and open to problems in his environment is important and also of immense urgency. Of all the environmental influences on development of creativity, education has received special interest. One of the most common goal of the educative system throughout the world refers to the development of creative personality.

Creativity has always been naturally associated with the arts, music, painting, designing, literature and drama-long before creative thinking was well understood. For the purpose in recent years more emphasis is given to the activities of Art Clubs and Science Clubs. A large number of Science Clubs and Art Clubs have been instituted in this country which aim at developing scientific attitudes, interest and creativity among the members. There has been considerable popular interest in training individuals for increased creativity. Students receive so much spoon-feeding in our present society in terms of how-to-do-it instructions – in school, at home and at work that most of them lack almost any opportunity for being creative. These institutes have been held regarding the integration of creative problem solving methodologies with the teaching of other academic subjects. There is also evidence that when creative efficacy has been developed by education, the improvement endures (Parnea and Meadow, 1960).

Thus any comparatively greater gains by the creative problem solving students could reasonably be attributed to the education. In Carl Roger's terms, education can help provide the 'psychological freedom' necessary to the creative individual. Sex differences also play a vital role in developing creativity. Many

(Raina, 1991, Cropley, 1967) studied the sex differences in creative thinking ability.

In West Bengal Art and Science Clubs are increasing day by day with the assistance from the Govt. Educational Institutions as well as private agencies, educationists and social workers. These clubs are running in different area by different names but with common intention of developing creativity. To the best knowledge of the author, no attempt had been made so far to evaluate the activities of such clubs in developing creativity among participants in club activities.

In this paper an attempt had been made to study the efficacy of the existing clubs in developing general creativity.

### REVIEW OF RELATED LITERATURE :

The present researcher seeks to present here studies which have proved to be significant value in providing an in-depth understanding about the present problem.

After vast survey of the previous literature it came to the mind of researcher that in the field of creativity major emphasis has been given on test construction and correlational studies with so many psychological factors but there has been a very little research on nurturing and promoting of creativity specially for the adolescent groups.

A mention of few studies may be presented as below :

Pise and Jadhav (2016) conducted a study for nurturing creativity through science education to identify awareness about creativity through science teaching. For the purpose descriptive method, i.e. survey was conducted on 60 science teacher from secondary schools of Pune city. A self-made creativity awareness scale was used and it was found that teachers should shoulder the responsibility to nurture creativity among students and a model was also prescribed to provide guidance for helping the teacher to include the creative element in their teaching.

Starko (2013) in his research work on creativity in the classroom schools of curious delight indicated facilities helps students to carry out creative activities. Lack of facilities in schools and environments may impede students' creative activities.

Madan (2011) studied on creativity education in India : breaking barriers and found that Indian teachers were successful in developing creativity for Indian students as they were taught the philosophy of creativity development, and they held a strong belief in students creativity. They used experimental, hands-on learning and created contentually relevant, creative environments to develop their students creativity.

Gupta (1990) developed and validated a creativity training programme and found it successful in developing various creative thinking abilities in students. The study reaffirmed the fact that creative thinking abilities of school children can be developed by deliberate methods of education and teaching.

Researchers like Amin (1988), Patel (1987), Singh (1985), Vora (1984) tried creative thinking programmes and found them effective.

Nirpharake (1980) developed a special training programme and pre-test post-test experiment and designed to study efficacy in developing creative appreciation. The experiment showed positive effect on experimental group on all aspects of creativity.

### OBJECTIVES :

The main objectives of the study were :

- i) to find out the creativity for the three different groups of children namely, Art Club exposure, Science Club exposure and Non-exposure to such clubs.
- ii) to assess the differences in the creativity of the said different groups of children.
- iii) to study the efficacy of Science and Art Clubs in developing creativity among its members.

### RESEARCH QUESTIONS :

On the basis of the above objectives, the following research questions were formulated :

- i) Is there any difference in creativity of children with exposure to Art and Science Clubs than that of

- children with no exposure to such clubs ?
- ii) Is there any efficacy of Art and Science clubs in developing creativity among its members ?

#### **METHODOLOGY :**

This paper aimed to study the efficacy of Art and Science Clubs in developing creativity among its members in Kolkata. In this case, the school going adolescents with exposure to Art and Science Clubs and non-exposure to such clubs were surveyed to serve the purpose.

#### **SAMPLE :**

For the present study, the sample consisted of 58 school going children (19 with Science Club exposure, 18 with Art Club exposure and 21 with no exposure to such clubs) reading in classes VII to X and age groups 13+ to 16+ respectively. The Science Club exposure group was taken from the Innovative Hub, Birla Industrial and Technological Museum, Kolkata. The Art Club exposure group was taken from New Art Centre, Kolkata and no exposure of such clubs group drawn from Hare School, Kolkata purposively. The subjects were chosen on the basis of their family environment, socio-economic status, parental occupation and such like determiners of creativity. The school and the above variables were controlled by choosing the subjects from almost same standard schools and from similar socio-economic status. The other two variables viz., sex and freedom were controlled.

The subjects were selected on the above mentioned principles to form three groups – Group I with the boys and exposure to Science Club, Group II with the boys and exposure to Art Club and Group III with the boys and no exposure to such clubs.

Sex variable was controlled by taking only boys as the subjects. A bio-data sheet was administered upon the three groups of boys and the groups were found equivalent with respect to the age, socio-economic status (including parental education and occupation), schooling, family size, child rearing practices etc. The groups were formed to have no significant difference in the mean scores which showed them equivalent with respect to freedom. The relevant statistics had been given in section (Table 1 and 2) clearly with presentation and analysis of data.

#### **DESIGN OF THE STUDY :**

The descriptive survey method was employed to fulfil the purpose of this particular study.

#### **Tools used :**

Following tools were administered for collecting data :

- i) A bio-data sheet developed by Sarkar with respect to age, socio-economic status (including parental education and occupation), schooling, family size and child rearing practices etc. was administered.
- ii) Freedom of thought and action learned by the students were assessed by Freedom Test; developed by Sarkar which consisted of degrees of thought and freedom received by the children in their family. The test was scored according to the scoring principles given with the test material.
- iii) Sarkar's Creativity Test, developed on the basis of factor-analytic model was used. This test was in Bengali and consisted of two parts :
  - a) Non-verbal : consisted of circle tasks, incomplete figure task and picture construction task.
  - b) Verbal : Unusual uses tests, similarity test, consequence test, stimulation test; common problems and product improvement task.

All the items for verbal and non-verbal parts were scored for fluency, flexibility and originality according to the scoring principle given in the manual.

#### **Statistical Techniques used :**

For the present study, the collected data were analysed using the following statistical techniques.

- i) Descriptive statistics -Mean, Standard Deviation and

ii) The critical ratio (C. R.) was used to test the significant difference between different groups.

#### Collection of Data :

The creativity and the freedom tests were administered in groups following the instructions laid down in the manual. The bio-data sheet was administered individually.

#### Limitations :

The present study was limited to :

- i) small sample size.
- ii) only male group of children.
- iii) only the Kolkata and surroundings.

#### Results and Discussions :

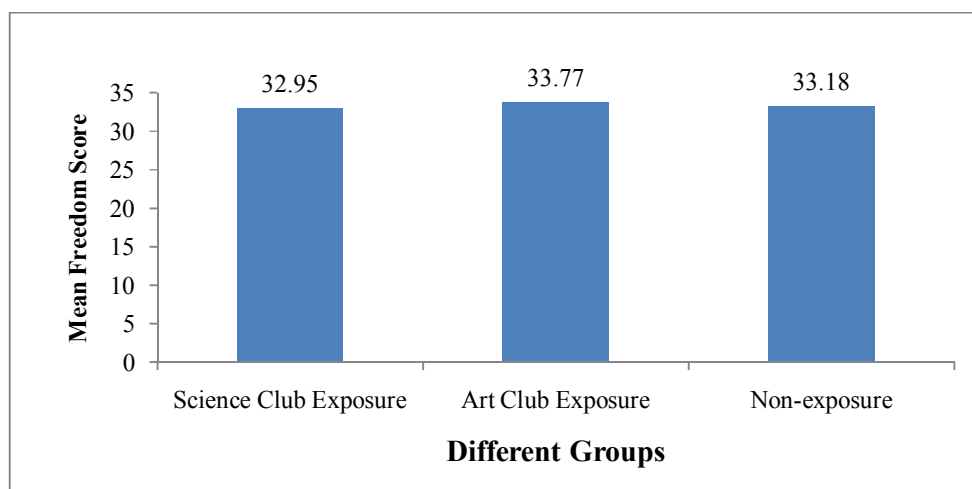
On the basis of analysis and interpretation of collected data, results and discussions were presented below :

#### (1) Freedom scores for different groups :

Means and Standard Deviations (SD) of Freedom Test were calculated and presented in Table – 1.

**Table 1 : Descriptive Statistics of Freedom Scores for Different Groups**

	Science Club Exposure	Art Club Exposure	Non-exposure
Mean	32.95	33.77	33.18
S. D.	8.05	8.51	6.48
N	19	18	21



**Fig. A : Graph showing Freedom Scores for Different Groups**

The C. R.'s between three groups were calculated and are presented in Table 2.

**Table 2 : C. R.'s between different groups**

S. C. E. & A. E.	0.301
A. E. & N. E.	0.240
S. C. E. & N. E.	0.100

S. C. E. = Science Club Exposure, A. E. = Art Club Exposure, N. E. = denotes Non-exposure.

No significant differences were found between the groups.

From Table 1 and Table 2, it was found that all groups were similar with regard to their freedom as none of critical ratios in Table 2 were found significant which was clearly depicted in Fig. A.

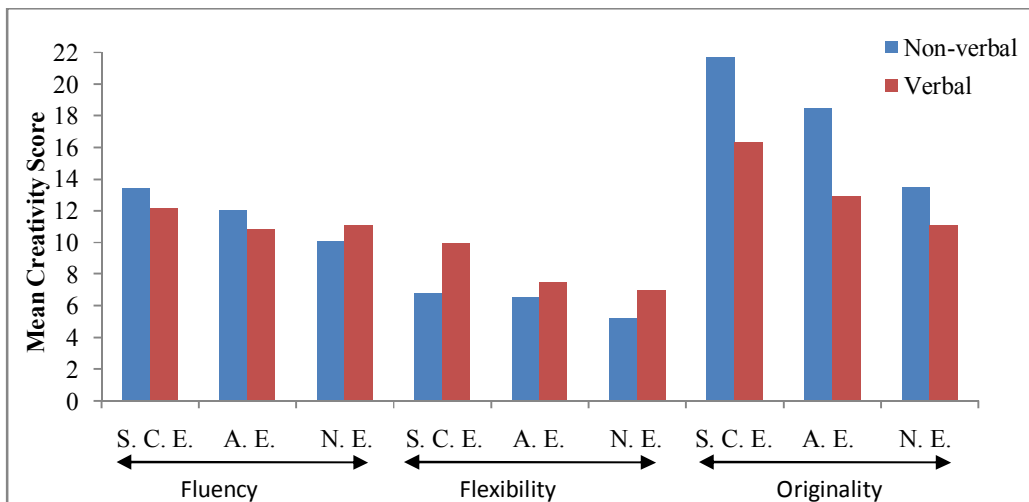
**(2) Creativity of children with exposure to Art and Science Clubs and the children with no exposure to such clubs.**

In answer to the first research question, the creativity score in the form of its different components (fluency, flexibility and originality) for each part, i.e. verbal and non-verbal were calculated.

Mean's and S. D.'s for fluency, flexibility and originality scores for different groups were calculated and presented in Table 3.

**Table 3 : Descriptive Statistics for Creativity Scores of Different Groups of Students**

		Fluency			Flexibility			Originality		
		S. C. E.	A. E.	N. E.	S. C. E.	A. E.	N. E.	S. C. E.	A. E.	N. E.
Non-verbal	Mean	13.43	12.02	10.11	6.75	6.53	5.23	21.68	18.5	13.52
	SD	6.21	3.98	4.56	3.23	2.64	2.49	14.32	8.24	12.39
	N	19	18	21	19	18	21	19	18	21
Verbal	Mean	12.20	10.86	11.09	9.95	7.5	7.02	16.33	12.90	11.09
	SD	5.75	6.16	2.16	4.98	6.04	5.25	10.00	10.76	9.32
	N	19	18	21	19	18	21	19	18	21



**Fig. B : Graph showing Creativity Scores of Different Groups of Students**

Critical Ratio's (C. R.) between groups were found and were presented in Table 4.

**Table 4 : Critical Ratio's between Different Groups**

	Non-verbal			Verbal		
	S. C. E.& A. E.	S. C. E. & N. E.	A. E. & N. E.	S. C. E. & A. E.	S. C. E. & N. E.	A. E. & N. E.
Fluency	0.833	1.92*	1.39	0.683	0.792	0.987
Flexibility	0.227	1.65*	1.57	0.630	1.812*	0.143
Originality	0.817	0.736	1.49	1.00	1.71*	0.557

\*Significant at 0.05 level.

A look into Table 4 revealed the following facts. In non-verbal part Science Club exposure group differed significantly from no exposure group in fluency, flexibility. In verbal part Science Club exposures and non-exposures differed significantly in originality scores. But the mean scores of the different groups such as the mean scores of Science Club exposure found to be greater than the non-exposure group and it was also greater for Art Club exposures than non-exposures. It was made clear by the bar diagram of the mean scores (Fig. B).

### (3) The efficacy of Art and Science Clubs in developing creativity among its members :

In answer to this second research question, creativity scores of subjects with different levels of exposure to Science Club and Art Club were studied.

Variations in mean creativity scores of subjects with different levels of exposure to Science Club and Art Club were given below :

**Table 5 : Descriptive Statistics for Creativity Scores of Children with Different Levels of Exposure to Science Club and Art Club**

Exposure in Years									
(a) Fluency									
		Non-verbal				Verbal			
		Upto 2 years	2+ to 4 years	4+ to 6 years	Total	Upto 2 years	2+ to 4 years	4+ to 6 years	Total
S. C. E.	N	10	6	3	19	10	6	3	19
	M	12.60	13.78	15.49	13.43	11.05	11.85	15.67	12.20
	S. D.	3.82	5.98	7.52	6.21	2.72	8.17	6.00	5.75
A. E.	N	7	7	4	18	7	7	4	18
	M	10.38	11.84	15.21	12.02	9.84	10.24	12.07	10.86
	S. D.	2.42	4.10	4.32	3.98	6.19	7.22	6.58	6.16
N. E.	N				21				21
	M				10.11				11.09
	S. D.				4.56				2.16
(b) Flexibility									
S. C. E.	N	10	6	3	19	10	6	3	19
	M	6.47	6.98	7.23	6.75	8.73	10.39	13.16	9.95
	S. D.	3.07	3.10	3.59	3.23	4.81	4.43	5.20	4.98
A. E.	N	7	7	4	18	7	7	4	18
	M	6.09	6.76	6.92	6.53	7.25	7.33	7.81	7.50
	S. D.	2.55	2.66	2.65	2.64	6.32	6.10	7.17	6.04
N. E.	N				21				21
	M				5.23				7.02
	S. D.				2.49				5.25
(b) Originality									
S. C. E.	N	10	6	3	19	10	6	3	19
	M	20.40	22.05	25.22	21.68	13.56	17.56	23.11	16.33
	S. D.	14.41	11.80	13.94	14.32	8.42	8.69	13.11	10
A. E.	N	7	7	4	18	7	7	4	19
	M	18.94	19.24	21.17	18.50	11.97	13.38	13.71	12.90
	S. D.	7.67	7.45	7.59	8.24	11.36	11.88	7.55	10.76
N. E.	N				21				21
	M				13.52				11.09
	S. D.				12.39				9.32

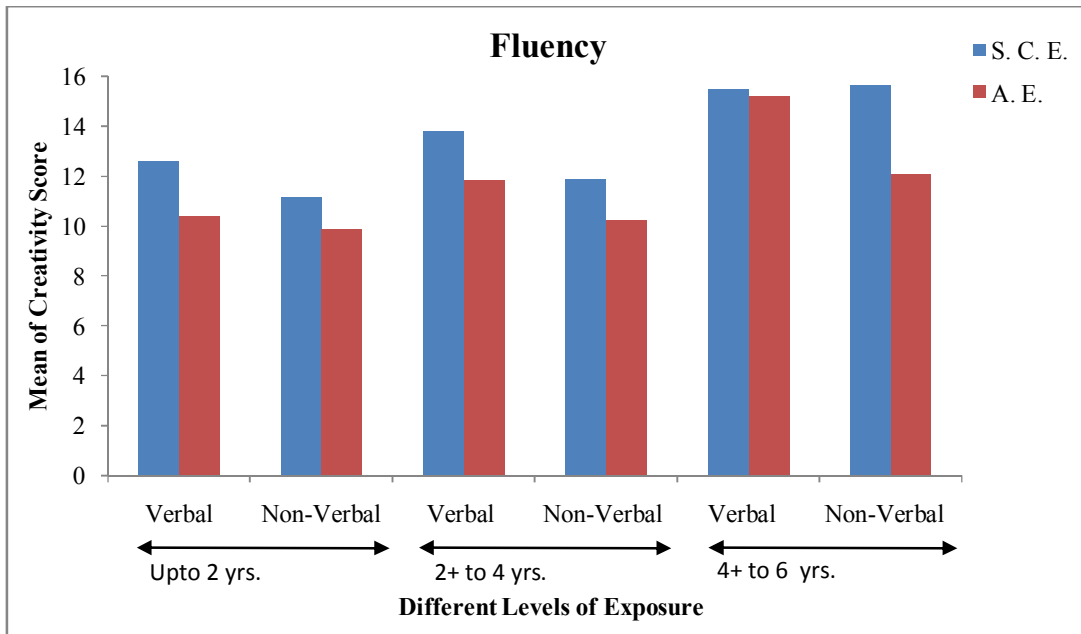


Fig. C : Graph showing Creativity Scores of Children in Fluency with Different Levels of Exposure to Science Club and Art Club

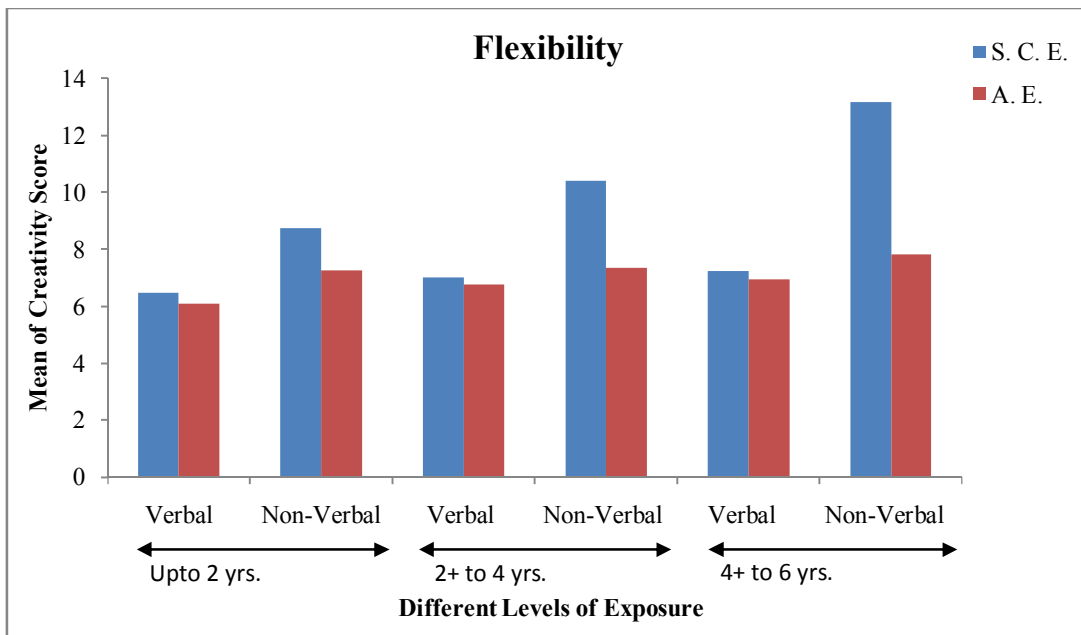
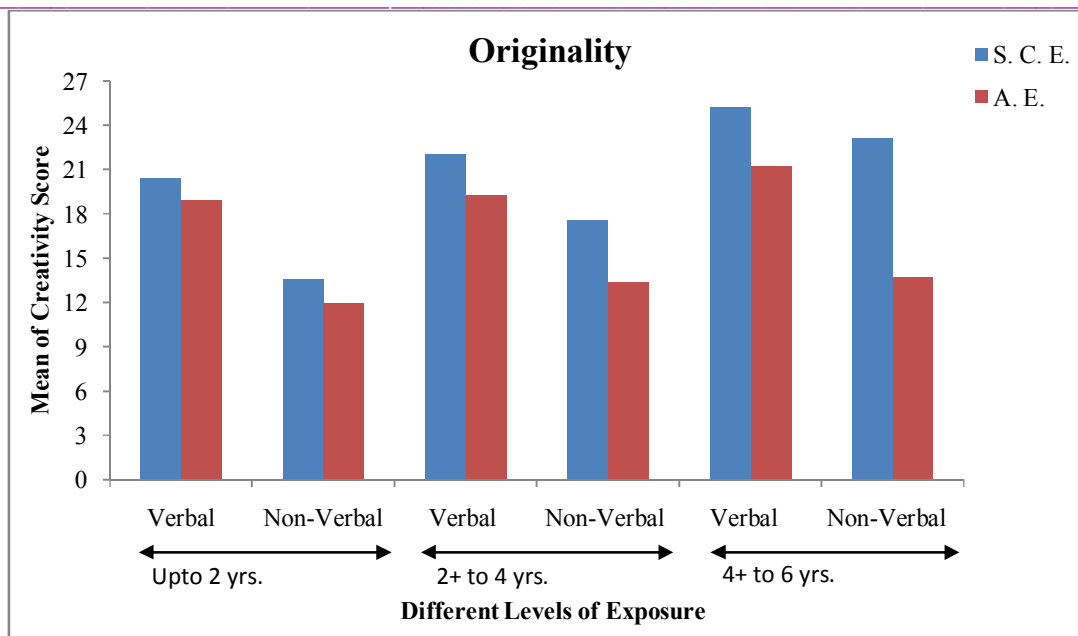


Fig. D : Graph showing Creativity Scores of Children in Flexibility with Different Levels of Exposure to Science Club and Art Club



**Fig. E : Graph showing Creativity Scores of Children in Originality with Different Levels of Exposure to Science Club and Art Club**

The differences in year-wise exposure to Art and Science Clubs in means of creativity scores found to be greater than that of no exposure group. The figures C, D and E gave a clear picture of mean scores (creativity) in students with different degrees of exposure to Art and Science Clubs. The difference were however, not found to be significant yet it was found that mean scores in creativity test were greater for the group with exposure to Art and Science Clubs than the mean scores for the group with no exposure to such clubs.

#### CONCLUSIONS :

From the above results and discussions, the following conclusions were drawn :

In the nonverbal part of the creativity Science Club exposure group differed significantly from no exposure group in its fluency and flexibility component.

In the verbal part, the Science Club exposures and non-exposures differed significantly in originality score only. Although the mean scores of different groups such as mean scores of Science Club exposures found to be greater than the non-exposure group.

Similarly, it was also greater for Art Club exposure than the non-exposure group.

In brief, it was observed that mean scores of creativity tended to increase with the increase of exposure to Science and Art Club.

Thus it may be concluded that the Art and Science Clubs play a vital role in developing creativity among the club members.

#### SUGGESTIONS :

Creativity as an attribute and natural talent must be nurtured and supplemented and so in future similar research should be undertaken to know how and what specific kind of art and science activities can promote creativity among the young children. For the purpose an organised experimental design, preferably with some form of random alteration of subjects under investigation should be needed.



---

**REFERENCES :**

1. Amin, M. J. (1988). To study the effectiveness of creative thinking programme on the creativity level of school children in relation to the programme correlates, Ph. D. Edu. SPU., p. 483.
2. Cropley, A. J. (1967). Creativity : A New Kind of Intellect, Australian Journal of Education, 2(2), pp. 120 – 125.
3. Gupta, P. K. (1990). Development and evaluation of creativity training programme for 6<sup>th</sup> grade children, Ph. D. Edu., Meerut Univ., p. 494.
4. Jadhav, V. G. & Pise, S. (2016). Nurturing Creativity Through Science Education, EduInspire, ISSN 2349-7076, ResearchGate, <https://www.researchgate.net/publication/312494462>.
5. Johnson, V. (1955). The Science Club – An Effective Teaching Device, Academy of Science, Norman, Oklahoma.
6. Madan, A. (2011). Creativity Education in India : Breaking Barriers, Three Case Vignettes. <https://www.inter-disciplinary.net/wp-content/uploads/2011/06/madancpaper.pdf>
7. Nirpharake, A. (1980). Training in Creative Appreciation, Jnana Prabodhini, Pune, p. 826.
8. Parnes, S. J. & Meadow, A. (1960). Evaluation of Training in Creative Problem Solving, J. Appl. Psychol., 1960, 43, pp. 189 – 194.
9. Patel, J. Z. (1987). An investigation into effectiveness of Purdue creative thinking programme on creative abilities of elementary school children. Dept. of Edu., SPU, p. 498.
10. Raina, M. K. (1991). Research in Creative Functioning : A Trend Report; In Fourth Survey of Research in Education (1983–88), NCERT, Vol. I, pp. 467–482.
11. Sarkar, A. K. (1980). Creative Thinking Test (Developed in 1980), Dept. of Education, K. U.
12. Sarkar, A. K. (1978). Freedom Test (Developed in 1978), Dept. of Education, K. U.
13. Singh, B. D. (1985). A study of the effect of a specially designed teaching strategy and some socio-psychological factors on creativity among middle school children. Ph. D. Edu. Avadh Univ., p. 512.
14. Starko, A. J. (2013). Creativity in the Classroom Schools of Curious Delight, New York : Routledge.
15. Vernon, P. E. (1966). Creativity and Intelligence, Ed., Res., 6(3), pp. 163 – 196.
16. Vora, G. C. (1984). An investigation into impact of divergent thinking programme in Mathematics on creative levels of children of classes VII and VIII. Ph. D. Edu., SPU, p. 521.